Craven District Council Level 1 Strategic Flood Risk Assessment

Final Report

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Revision History

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Initial Draft v2.0 22 September 2016	-	Amy Tawton (LPA)
Final Report v1.2 31 October 2016	Report structure revised, various changes following comments on draft report from CDC, Environment Agency and NYCC.	Amy Tawton (LPA) Digital copy only
Final Report v1.3 27 January 2017	Update to include additional sites in development site assessment and additional data from Yorkshire Water.	David Sykes (LPA) Digital copy only

Contract

This report describes work commissioned by David Smurthwaite, on behalf of Craven District Council, by a letter dated 2 June 2016. Craven District Council's representatives for the contract were Henry Cumbers, Amy Tawton and David Sykes. Jacqui Wallace of JBA Consulting carried out this work.

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Purpose

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JBA Consulting has no liability regarding the use of this report except to Craven District Council.

Acknowledgements

JBA would like to thank all Craven District Council, Environment Agency, Yorkshire Water and United Utilities staff for their time and commitment to providing data and discussing the issues identified during the course of this study.

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Executive Summary

This Level 1 Strategic Flood Risk Assessment (SFRA) updates the previous Level 1 assessment for Craven District, which was undertaken as part of the North-West Yorkshire SFRA in 2010. Craven District Council (CDC) require this update to initiate the sequential risk-based approach to the allocation of land for future development needed for CDC's new Local Plan (due for submission in late 2016). The area within Craven District Council's boundary that falls within the Yorkshire Dales National Park is however excluded from the SFRA, as planning within the National Park is the responsibility of the National Park Authority.

The Craven District is predominantly rural but includes a number of large settlements; Skipton, Settle, Ingleton, High and Low Bentham, Hellifield, Gargrave, Glusburn and Sutton-in-Craven. There are five main river systems; the rivers Greta, Wenning, Ribble, Aire and Wharfe, as well as The Leeds-Liverpool Canal.

The SFRA utilises the most up-to-date flood risk information and has been carried out in line with the Government's latest flood risk and planning policy guidance, which includes the National Planning Policy Framework[1] (NPPF) and Flood Risk and Coastal Change Planning Practice Guidance[2] (FRCC-PPG). The main deliverables of the SFRA are:

- This report.
- The Development Site Assessment spreadsheets and accompanying standalone report, detailing the risk to each site with recommendations on development (Appendix A).
- The detailed interactive GeoPDF maps showing key flood risk information together with the preferred development sites (Appendix B).

The SFRA has achieved the following:

- It provides an understanding of flood risk from all sources and identifies the extent and severity of flood risk across the district. This assessment will enable CDC to steer development away from areas where flood risk is considered greatest, ensuring that development is undertaken in a safe, cost effective and sustainable manner.
- It makes recommendations on the suitability of preferred development sites, based on flood risk, for CDC's new Local Plan.
- It considers surface water flood risk, using the Environment Agency's latest surface water map, Risk of Flooding from Surface Water (RoFSW).
- It provides a reference document (this report) to which all parties involved in development planning and flood risk can reliably turn to for initial advice and guidance; CDC planning officers, developers and North Yorkshire County Council in their role as Lead Local Flood Authority (including for consultation on planning applications for the approval of SuDS schemes).
- It enables CDC to meet its obligations under the National Planning Policy Framework (NPPF).
- It supplements current policy guidelines and provides a straightforward risk based approach to development management in the area. It also provides guidance on the potential risk of flooding associated with future planning applications and the basis for site-specific Flood Risk Assessments (FRAs) where necessary.
- It contributes to the evidence base and informs the Sustainability Appraisal (incorporating the Strategic Environmental Assessment) for CDC's new Local Plan.
- Land required for current and future flood management that should be safeguarded as set out in the NPPF has been identified.
- Advice is given on the applicability of Sustainable Drainage Systems (SuDS) for managing surface water runoff.
- It has assisted CDC in identifying specific locations where further and more detailed flood risk data and assessment work is required as part of a Level 2 SFRA or site-specific FRA, prior to the allocation of specific developments.

1 http://planningguidance.planningportal.gov.uk/blog/policy/

2 http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/

CDC provided a list of preferred development sites which had been derived from the Strategic Housing and Employment Land Availability Assessment. An assessment has been made of flood risk to all of CDC's latest preferred development sites, as well as CDC's net developable areas, to assist the council in the decision making process for sites to progress as part of the new CDC Local Plan. A number of preferred development sites are shown to be at flood risk from fluvial, tidal and surface water sources. The following table summarises the number of sites at risk from each Flood Zone as per the Environment Agency's Flood Map for Planning (February 2016).

Number of preferred development sites at risk from Environment Agency Flood Zones

Preferred Development Sites	Number of sites within…		
	Flood Zone 2	Flood Zone 3a	Flood Zone 3b
Housing	18	12	2
Employment	4	2	1
Mixed use	3	3	2
TOTAL	**25**	**17**	**5**

Recommendations have been made for each development site at risk which fall under the following categories;

- Consider withdrawing the site based on level of flood risk;
- Exception Test required if site passes Sequential Test;
- Consider site layout and design if site passes Sequential Test;
- Site-specific FRA required; and
- Site permitted on flood risk grounds due to no perceived risk, subject to consultation with the LPA / LLFA.

Out of the 80 sites provided for assessment by CDC, five are within or partially within the functional floodplain (Flood Zone 3b) delineated for this SFRA. Out of these five sites, two are recommended for withdrawal where the level of risk is considered too great for development to proceed. There is one site that is recommended for withdrawal based on significant surface water flood risk. Further details are given in the Development Site Assessment spreadsheets and accompanying standalone report in Appendix A.

This SFRA has been produced using the latest flood risk data and information available at the time of publication. The reader is advised to confirm with CDC that the latest information is being used when decisions concerning development and flood risk are being made. The SFRA should be considered as a "live" document which can be updated as and when new information becomes available. If there is a significant flood affecting the area an immediate review should be undertaken. It is strongly recommended that the information in this SFRA is reviewed once the Skipton FAS is completed and new flood risk information available from the accompanying modelling study. It should also be updated once Environment Agency river models have been updated for the newly released climate change allowances. In the meantime, all site-specific flood risk assessments should consider the new Environment Agency climate change allowances.

The SFRA report is comprised of two parts;

- Part 1 discusses the SFRA analysis which is specific to the CDC area.
- Part 2 outlines the more generic policy information forming the background to the SFRA.

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Abbreviations

ABD ..... Areas Benefitting from Defences
AEP ..... Annual Exceedance Probability
AStGWF ..... Areas Susceptible to Groundwater Flooding
CC ..... Climate change
CCA ..... Civil Contingencies Act
CDA ..... Critical Drainage Area
CDC ..... Craven District Council
CFMP ..... Catchment Flood Management Plan
CIL ..... Community Infrastructure Levy
CSO ..... Combined Sewer Overflow
DCLG ..... Department for Communities and Local Government
DPD ..... Development Plan Documents
DTM ..... Digital Terrain Model
EA ..... Environment Agency
FAA ..... Flood Alert Area
FCA ..... Flood Consequence Assessment
FCDPAG ..... Flood and Coastal Defence Project Appraisal Guidance
FCERM ..... Flood and Coastal Erosion Risk Management Network
FDGiA ..... Flood Defence Grant in Aid
FEH ..... Flood Estimation Handbook
FRA ..... Flood Risk Assessment
FRCC-PPG ..... Flood Risk and Coastal Change Planning Practice Guidance
FRM ..... Flood Risk Management
FRMP ..... Flood Risk Management Plan
FRMS ..... Flood Risk Management Strategy
FRR ..... Flood Risk Regulations
FSA ..... Flood Storage Area
FWA ..... Flood Warning Area
FWMA ..... Flood and Water Management Act
GI ..... Green Infrastructure
GIS ..... Geographical Information Systems
HFM ..... Historic Flood Map
IDB ..... Internal Drainage Board
JBA ..... JBA Consulting
LA ..... Local Authority
LDF ..... Local Development Framework
LFRMS ..... Local Flood Risk Management Strategy
LLFA ..... Lead Local Flood Authority

LPA	Local Planning Authority
LRF	Local Resilience Forum
MAFRP	Multi-Agency Flood Response Plan
NGO	Non-Governmental Organisation
NPPF	National Planning Policy Framework
NYCC	North Yorkshire County Council
NYFRS	North Yorkshire Fire and Rescue Service
PCPA	Planning and Compulsory Purchase Act
PFRA	Preliminary Flood Risk Assessment
RBD	River Basin District
RBMP	River Basin Management Plan
RMA	Risk Management Authority
RoFRS	Risk of Flooding from Rivers and the Sea
RoFSW	Risk of Flooding from Surface Water
RSS	Regional Spatial Strategy
SA	Sustainability Appraisal
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SoP	Standard of Protection
SPD	Supplementary Planning Documents
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
UDP	Unitary Development Plan
uFMfSW	updated Flood Map for Surface Water
UKCIP02	UK Climate Projections 2002
UKCP09	UK Climate Projections 2009
UU	United Utilities
WFD	Water Framework Directive
YW	Yorkshire Water

Part 1: Flood Risk in Craven

1 Introduction

Craven District is subject to a two-tiered local government system with Craven District Council (CDC) acting as the Local Planning Authority (LPA) and North Yorkshire County Council (NYCC) the Lead Local Flood Authority (LLFA). As LPA, CDC requires a Level 1 Strategic Flood Risk Assessment (SFRA) to develop the evidence base for their Local Plan which will include a review of planning policies, including the Sustainability Appraisal (SA). NYCC, as LLFA, is responsible for managing flood risk from ordinary watercourses, surface water and groundwater. They are also a statutory consultee on all major planning applications submitted to the LPA.

1.1 Craven District Council Level 1 SFRA Update

In a letter dated 2 June 2016, Craven District Council (CDC) commissioned JBA Consulting (JBA) to undertake an update of the existing Level 1 Strategic Flood Risk Assessment for Craven which was completed as part of a wider SFRA for North West Yorkshire in July 2010. The update is required to initiate the sequential risk-based approach to the allocation of land for development.

This document therefore provides a Level 1 SFRA update for the Craven LPA area only. A large area of the Yorkshire Dales National Park lies within the Craven District Council boundary but is excluded from this assessment, as the National Park Authority are the LPA for that area.

The updated SFRA makes use of the most up-to-date, readily available, flood risk datasets to assess the extent of risk, at a strategic level, to preferred development allocation sites identified by CDC. There are three elements to the SFRA;

- this report
- Development Site Assessment spreadsheets - three spreadsheets indicating the level of flood risk to each development site following a strategic assessment of risk. These are accompanied by a standalone document outlining recommendations for development of the sites (included in this report as Appendix A)
- the SFRA maps - a suite of interactive pdf maps showing CDC's preferred development sites in conjunction with the latest flood risk information (Appendix B)

This information will allow CDC to identify the strategic development options that may be applicable to each site and to inform on the need for application of the Sequential and Exception Tests. North Yorkshire County Council as the LLFA will need to be involved throughout the process, co-ordinating views and activity with CDC.

This update has been carried out in accordance with the Government's latest development planning guidance including the National Planning Policy Framework[3] (NPPF) and flood risk and planning guidance called the Flood Risk and Coastal Change Planning Practice Guidance (FRCC-PPG). The latest guidance is available online via:

http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change

At the time of writing, CDC is preparing its new Local Plan[4] which will take forward the spatial strategy of the adopted plan and include the allocation of sites for future development. As such, the Local Plan will play a direct role in delivering the district's regeneration and growth objectives, which will be informed by this Level 1 SFRA update. The new Local Plan, due for submission in 2017 with an examination in public scheduled to follow, will replace the current Local Plan adopted in 1999.

1.2 SFRA Objectives

The objectives of this Level 1 SFRA update are:

- To understand flood risk from all sources and investigate and identify the extent and severity of flood risk across the district. This assessment will enable CDC to steer development away from areas where flood risk is considered greatest, ensuring that development is undertaken in a safe, cost effective and sustainable manner.

3 http://planningguidance.communities.gov.uk/blog/policy/

4 http://www.cravendc.gov.uk/newlocalplan

- To develop a report that forms the basis of an informed development management process, which also provides guidance on the potential risk of flooding associated with future planning applications and the basis for site-specific Flood Risk Assessments (FRAs) where necessary.
- To make recommendations on the suitability of preferred development sites, based on flood risk, for CDC's new Local Plan.
- To pay particular attention to surface water flood risk, using the Environment Agency's latest surface water map, Risk of Flooding from Surface Water (RoFSW).
- To provide a reference document (this report) to which all parties involved in development planning and flood risk can reliably turn to for initial advice and guidance; CDC planning officers, developers and North Yorkshire County Council in their role as Lead Local Flood Authority (including for consultation on planning applications for the approval of SuDS schemes).
- To enable CDC to meet its obligations under the National Planning Policy Framework (NPPF).
- To supplement current policy guidelines and to provide a straightforward risk based approach to development management in the area.
- To contribute to the evidence base and inform the Sustainability Appraisal (incorporating the Strategic Environmental Assessment) for the council's new Local Plan.
- To identify land required for current and future flood management that should be safeguarded as set out in the NPPF.
- To advise on the applicability of Sustainable Drainage Systems (SuDS) for managing surface water runoff.
- To assist CDC in identifying specific locations where further and more detailed flood risk data and assessment work is required as part of a Level 2 SFRA, prior to the allocation of specific developments.

This report outlines the connections between the planning framework and flood risk policy, discussing legislation, planning policy, flood risk management policy and the roles and responsibilities of key stakeholders. All available sources of flood risk within the local authority area are examined and flood risk to the potential development sites is assessed. Conclusions and recommendations are cited at the end of the report.

1.3 SFRA Future Proofing

This SFRA has been compiled using the most up-to-date data and information available at the time of production. Changes in the future have been anticipated as far as possible, however the reader is advised to confirm with the source organisation that the latest information is being used when decisions concerning development and flood risk are being made. The February 2016 version of the Environment Agency's Flood Map for Planning has been used to assess fluvial and tidal risk to potential development sites. This is updated at quarterly intervals by the Environment Agency, as and when new modelling data becomes available. The reader should therefore refer to the online version of the Flood Map for Planning to check whether updates may have been made to the Flood Zones since February 2016:

http://apps.environment-agency.gov.uk/wiyby/37837.aspx

This SFRA references the Flood Risk and Coastal Change Planning Practice Guidance (FRCC-PPG) and the National Planning Policy Framework (NPPF), as these are the primary development and flood risk guidance documents available at the time of publication.

The SFRA should be considered as a 'live' document which can be updated as and when new information becomes available. The Environment Agency recommends updating an SFRA every three to four years, unless there is a significant flood affecting the area, in which case an immediate review should be undertaken. This SFRA should be updated once Environment Agency river models have been updated for the newly released climate change allowances (February 2016). In the meantime, all site-specific flood risk assessments should consider the new Environment Agency climate change allowances.

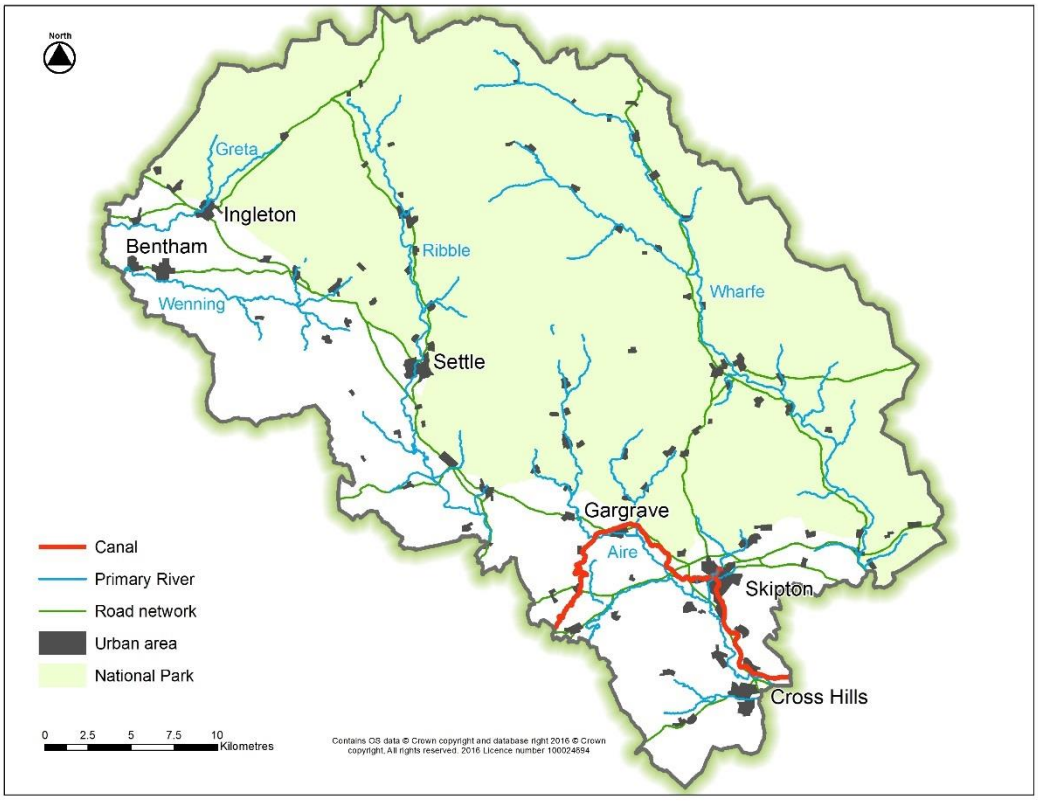
2 Study Area

The population of the Craven District was estimated at approximately 56,000 in 2015[5]. The district boundary includes the Yorkshire Dales National Park (YDNP). Within the park area, the National Park Authority are responsible for planning control. As the edge of the park lies roughly along the A65 to the north of Skipton and the A59 east towards Harrogate, planning control in some villages is split between the National Park Authority and Craven District Council.

For the purposes of this SFRA update, the national park area has been omitted. It is worth noting however that actions taken within the national park could potentially influence flood risk downstream in Craven, as the headwaters of the main rivers in the district lie within the park. Excluding the national park, the Craven District covers an area of 370km^2. It is predominantly rural, but includes a number of large settlements; Skipton, Settle, Ingleton, High and Low Bentham, Hellifield, Gargrave, Glusburn and Sutton-in-Craven. Skipton is the largest town. Figure 2-1 shows the national park area along with larger settlements and the network of watercourses within the study area.

There are five main rivers in the district, each with a number of tributaries; the rivers Greta and Wenning in the north-west, the River Ribble in the central area and the rivers Aire and Wharfe in the south-east. The Leeds-Liverpool Canal runs mainly through rural areas of the district but also passes through Skipton and Gargrave.

Figure 2-1: Craven District Council SFRA study area



A broad scale map of soil types was used to give an indication of the predominant soils of the district (available from the National Soil Research Institute[6]). Soils in the main river valleys are described as freely draining floodplain soils. Outside the valleys, soils are said to be acidic with impeded drainage and peat is present in some areas. The underlying geology is carboniferous limestone. Geology and soils should be investigated further at a site level during a FRA.

5 http://www.northyorks.gov.uk/article/23704

6 http://www.landis.org.uk/soilscapes/

3 Understanding Flood Risk

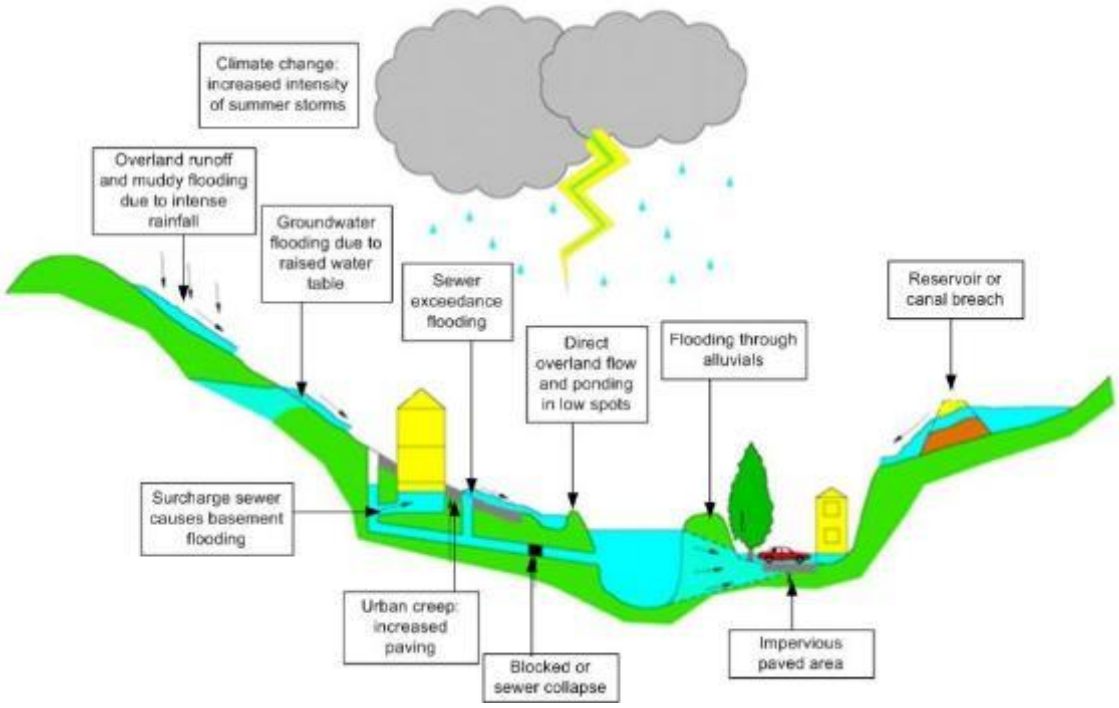
3.1 Sources of Flooding

Flooding is a natural process and can happen at any time in a wide variety of locations. It constitutes a temporary covering of land not normally covered by water and presents a risk when people and human or environmental assets are present in the area that floods. Assets at risk from flooding can include housing, transport and public service infrastructure, commercial and industrial enterprises, agricultural land and environmental and cultural heritage. Flooding can occur from many different and combined sources and in many different ways. Major sources of flooding include (also see Figure 3-1):

- **Fluvial** (rivers) - inundation of floodplains from rivers and watercourses; inundation of areas outside the floodplain due to influence of bridges, embankments and other features that artificially raise water levels; overtopping or breaching of defences; blockages of culverts; blockages of flood channels/corridors.
- **Tidal** - sea; estuary; overtopping of defences; breaching of defences; other flows (e.g. fluvial surface water) that could pond due to tide locking; wave action.
- **Surface water** - surface water flooding covers two main sources including direct run-off from adjacent land (pluvial) and surcharging of piped drainage systems (public sewers, highway drains, etc.)
- **Groundwater** - water table rising after prolonged rainfall to emerge above ground level remote from a watercourse; most likely to occur in low-lying areas underlain by permeable rock (aquifers); groundwater recovery after pumping for mining or industry has ceased.
- **Infrastructure failure** - reservoirs; canals; industrial processes; burst water mains; blocked sewers or failed pumping stations.

Different types and forms of flooding present a range of different risks and the flood hazards of speed of inundation, depth and duration of flooding can vary greatly. With climate change, the frequency, pattern and severity of flooding are expected to change and become more damaging.

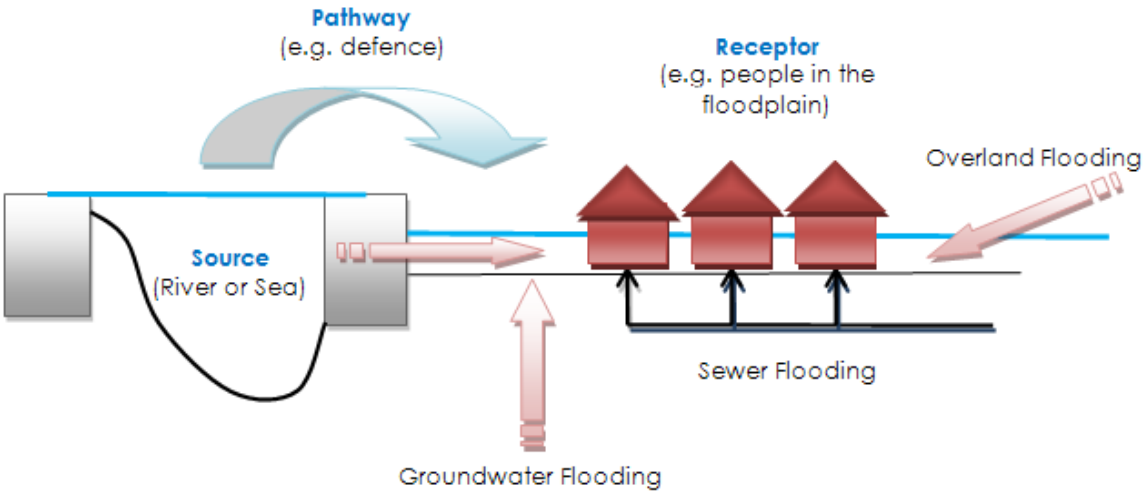
Figure 3-1: Flooding from all sources



3.2 Likelihood and Consequence

Flood risk is a combination of the likelihood of flooding and the potential consequences arising. It is assessed using the source – pathway – receptor model as shown in Figure 3-2 below. This is a standard environmental risk model common to many hazards and should be the starting point of any assessment of flood risk. However, it should be remembered that flooding could occur from many different sources and pathways, and not simply those shown in the illustration below.

Figure 3-2: Source-Pathway-Receptor Model



The principal sources are rainfall or higher than normal sea levels, the most common pathways are rivers, drains, sewers, overland flow and river and coastal floodplains and their defence assets and the receptors can include people, their property and the environment. All three elements must be present for flood risk to arise. Mitigation measures have little or no effect on sources of flooding but they can block or impede pathways or remove receptors.

The planning process is primarily concerned with the location of receptors, taking appropriate account of potential sources and pathways that might put receptors at risk. It is therefore important to define the components of flood risk in order to apply this guidance in a consistent manner.

3.2.1 Likelihood

Likelihood of flooding is commonly quantified as the percentage probability of occurrence based on the average frequency of flood events over a large number of years (measured or extrapolated from records). For instance, a 1% annual exceedance probability (AEP) indicates the flood magnitude that has a 1% chance of being reached or exceeded in any one year. The same event can be described as having a 100-year return period, because a 1% AEP event has a 1 in 100 chance of occurring within any given year and therefore will occur, on average, once in 100 years.

In other words, in a 1000 year period, assuming no external influences made flooding more or less likely over time, there would be an expectation of seeing 10 events that exceeded the flood magnitude associated with a 1% annual exceedance probability. These 10 events might not be equally spaced in time but, roughly / based on averages, they would occur once every 100 years.

Similarly, a 0.1% AEP is an event that has a 1 in 1000 chance of occurring in any given year (1000-year return period), whilst a 0.5% AEP is an event that has a 1 in 200 chance of occurring in any given year (200-year return period) and 3.3% AEP has a 1 in 30 chance of occurring in any given year (30-year return period).

Table 3-1 gives flood probabilities used to describe Flood Zones as defined in the FRCC-PPG and used by the Environment Agency in their Flood Map for Planning (Rivers and Sea)[7].

7 http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=floodmap

Table 3-1: NPPF Flood Zones[8]

Flood Zone	Annual Probability of Flooding
1	Low Probability: This zone comprises land having a less than 1 in 1,000 annual probability (<0.1%) of river or sea flooding (all land outside Zones 2 and 3).
2	Medium Probability: This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% - 0.1%). (Shown in light blue on the Flood Map)
3	3a - High Probability: This zone comprises land having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year. (Shown in dark blue on the Flood Map) 3b - 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)

Considered over the lifetime of a development, even a 1% annual exceedance probability flood has a good chance of occurring. For example:

- A 1% AEP flood has a 26% (1 in 4) chance of occurring at least once in a 30 year period - the period of a typical residential mortgage.
- A 1% AEP flood has a 49% (1 in 2) chance of occurring in a typical human lifetime of 70 years.
- A 1% AEP flood has a 66% (2 in 3) chance of occurring in a 100 year period - typically the age of much of the Victorian housing stock in the UK.

3.2.2 Consequence

The consequences of flooding include fatalities, property damage, disruption to lives and businesses, with severe implications for people (e.g. financial loss, emotional distress, health problems). Consequences of flooding depend on the hazards caused by flooding (depth of water, speed of flow, rate of onset, duration, wave-action effects, water quality) and the vulnerability of receptors (type of development, nature, e.g. age-structure, of the population, presence and reliability of mitigation measures etc.).

Flood risk is then expressed in terms of the following relationship:

Flood risk = Probability of flooding x Consequences of flooding

3.3 Risk

Flood risk is not static; it cannot be described simply as a fixed water level that will occur if a river overtops its banks or from a high spring tide that coincides with a storm surge. It is therefore important to consider the continuum of risk carefully. Risk varies depending on the severity of the event, the source of the water, the pathways of flooding (such as the condition of flood defences) and the vulnerability of receptors as mentioned above.

3.3.1 Actual Risk

This is the risk 'as is' taking into account any flood defences that are able to protect an area from flooding. The degree of protection offered to an area that benefits from the presence of a defence depends on its Standard of Protection (SoP). For instance, if the defence offers a Standard of

8 Table 1, Paragraph 065 of the Flood Risk and Coastal Change Planning Practice Guidance

Protection equivalent to the 1% AEP event, the expectation would be for properties protected by the defence to be safe during any floods that are less than the 1% AEP in magnitude.

Actual risk describes the primary, or prime, risk from a known and understood source managed to a known SoP. Actual risk should take into consideration the impact of any type of flood management infrastructure including raised embankments, flood walls, flood storage schemes and pumping stations. It is important to note that whist the actual risk may be low due to the presence of flood management infrastructure such as defences, the impact of a failure of the infrastructure may be high. It is also important to recognise that risk comes from many different sources. For example, whilst the actual risk of fluvial inundation may be low behind a defence there could still be moderate risk from surface water, which may even pond behind the defence in low spots.

3.3.2 Residual Risk

The actual risk of flooding to a settlement that lies behind a fluvial flood defence that is designed to provide a standard of protection (SoP) to the 1% AEP (1 in 100-year event) level is considered low. However even when flood defences are in place, there is always a likelihood that these could be overtopped in an extreme event or that they could fail or breach. Where there is a consequence to that occurrence, this risk is known as residual risk. Defence failure can lead to rapid inundation of fast flowing and deep floodwaters, with significant consequences to people, property and the local environment behind the defence.

Residual risk does not only arise from failure of defences, it can arise from failure of any flood management infrastructure such as blockage of a surface water conveyance system, overtopping of an upstream storage area or failure of a pumped drainage system. Residual risk is considered as part of the Exception Test (see Section 8.1). Developers must be able to demonstrate that development will be safe.

4 Flood Risk within Craven District

This section provides a strategic overview of flood risk from all sources within the district, to assist CDC in performing the Sequential Test. This SFRA is based on the best available information at the time of publication. The sources of information are documented in Table 4-1. It is worth noting that the area covered by the Yorkshire Dales National Park has not been included.

4.1 Flood Risk Datasets

Table 4-1 provides a summary of the key datasets used to compile this SFRA, arranged according to the source of flooding.

Table 4-1: Flood source and key datasets

Flood Source	Datasets / Studies
Fluvial	Environment Agency Flood Map for Planning (Rivers and Sea) (February 2016)
	Environment Agency Risk of Flooding from Rivers and the Sea (May 2016)
	Environment Agency Flood Risk Mapping Studies
	Historical evidence: Environment Agency Historic Flood Map
	Catchment Flood Management Plans: for Lune, Aire, Ribble and Ouse
Pluvial (surface water runoff)	Environment Agency Risk of Flooding from Surface Water, RoFSW (December 2013)
Sewer	United Utilities and Yorkshire Water DG5 Information
Groundwater	Environment Agency Areas Susceptible to Groundwater Flooding, AStGWF (2010)
Canal	Canal & River Trust Asset Database
Reservoir	Environment Agency Reservoir Flood Maps (available online)
All sources	North Yorkshire Local Flood Risk Management Strategy
	NYCC Preliminary Flood Risk Assessment
	NYCC Flood Response Coordination Plans
	Humber River Basin Management Plan
	Humber Flood Risk Management Plan
	NW Yorkshire Level 1 SFRA 2010
	Craven flooded properties 2012 and 2015 (flooding recorded by CDC, NYCC and Fire and Rescue Service)
Flood risk management infrastructure	Environment Agency flood defence data
	Canal & River Trust Asset Database

4.2 Fluvial Flooding

Fluvial flooding is associated with the exceedance of channel capacity during higher river flows. The process of flooding from watercourses depends on a number of characteristics associated with the catchment including; geographical location and variation in rainfall, steepness of the channel and surrounding floodplain, and infiltration and runoff rates associated with soil type and land use within the catchment.

4.2.1 Environment Agency Flood Map for Planning

The Environment Agency's Flood Map for Planning is the primary dataset used by planners for identifying the expected location and extent of fluvial and tidal flooding. It provides flood extents for several different fluvial and tidal events. These are defined as Flood Zones.

Flood Zone 3 represents the 1 in 100 AEP fluvial event and the 1 in 200 AEP tidal event. Flood Zone 2 represents the 1 in 1000 AEP fluvial and tidal flood events. The Flood Zones were originally prepared by the Environment Agency using a methodology based on the national digital terrain model (NextMap), deriving river flows from the Flood Estimation Handbook (FEH) methods and two-dimensional flood routing. Flood Zone information has been regularly updated by the

Environment Agency to include outputs from detailed hydraulic models, many developed as part of the national flood risk mapping programme.

The Environment Agency's Flood Map for Planning can be seen on the SFRA Maps in Appendix B, outlining fluvial and tidal flood extents across the district, in terms of Flood Zones 2 and 3.

There are a number of main rivers within the Craven District Council area which contribute to the risk of fluvial flooding. In the north-west the rivers Greta and Wenning, and their associated tributaries, create a relatively narrow corridor of risk along the watercourses. The majority of this affects rural and agricultural land. There is some risk to properties in the settlements of Ingleton and Burton in Lonsdale from the River Greta, and in High and Low Bentham from the River Wenning. In the central part of the district, the River Ribble and tributaries pose a risk to properties in parts of Settle, Giggleswick and Hellifield. An extensive area of rural land south of Settle is also at risk. To the south-east of the district, a large area is shown to be at risk of flooding from the River Aire and its tributaries. This falls mainly on rural and agricultural land, however, the flood risk also affects many large settlements; Gargrave, Skipton, Low Bradley, Cononley, Kildwick, Cross Hills, Glusburn and Sutton-in-Craven. Transport infrastructure is also at risk, for example the A629 near Kildwick plus minor roads near Carleton and in Cross Hills and Glusburn. A tributary of the River Wharfe also contributes to a narrow corridor of fluvial flood risk in the east of the district near Bolton Bridge, near the edge of the National Park.

The Environment Agency Flood Map for Planning is precautionary. It does not take account of flood defence infrastructure (which can be breached, overtopped or may not be in existence for the lifetime of the development). It therefore represents a worst-case scenario of flooding. The Flood Zones only represent fluvial and tidal flooding; they do not consider flooding from other sources. Nor do they take account of climate change.

Fluvial and tidal flood risk to potential development sites has been assessed for this SFRA using the Environment Agency Flood Map for Planning (February 2016), as per the NPPF and the accompanying Flood Risk and Coastal Change Planning Practice Guidance. Results of the assessment are given in Appendix A.

The Flood Map for Planning is updated at quarterly intervals by the Environment Agency, as and when new modelling data becomes available. The latest version of the Flood Map for Planning is available online. The reader should refer to the online version to determine if the Flood Zone information has been updated since the time of publication of the data used for this SFRA (February 2016).

The data can be viewed at **http://apps.environment-agency.gov.uk/wiyby/37837.aspx**

As required by the FRCC-PPG for SFRAs, Flood Zone 3 has been subdivided into Flood Zone 3a and Flood Zone 3b. Flood Zone 3b is also referred to as functional floodplain.

4.2.2 Functional Floodplain (Flood Zone 3b) and Flood Zone 3a

The FRCC-PPG (Table 1, Paragraph 065) defines Flood Zone 3b as:

"…land where water has to flow or be stored in times of flood."

The FRCC-PPG (Paragraph 015) states the following:

"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.

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."

A technical note is provided in Appendix C which explains the methodology used to delineate the current functional floodplain extent for the Craven district. This methodology was developed in conjunction with the LLFA and the Environment Agency.

The FZ3b outline produced for the 2010 SFRA provided the basis of the FZ3b for this study. In addition to this, as part of this SFRA, the Environment Agency provided all of its most recent, readily available modelled flood outlines for the district. Appropriate model outlines from recent studies were then used to create an updated functional floodplain extent. Where a 5% AEP (1 in 20-year event) defended scenario outline was available, this was used. For studies where a 5% AEP scenario was not produced, the 4% AEP (1 in 25-year event) defended scenario outline was used. If a defended scenario was not available, the undefended scenario outline was used. Table 4-2 shows the recent modelling study outputs provided by the Environment Agency, which were included when creating the updated functional floodplain for this SFRA. Details of the modelling study outlines used to delineate FZ3b for the 2010 SFRA are provided in the technical note in Appendix C.

The Environment Agency Historic Flood Map (HFM) and Flood Storage Area (FSA) datasets were also used to create the updated functional floodplain extent.

Table 4-2: Flood mapping studies and outputs

Modelling study	Output
Clapham Beck flood risk mapping study, 2011	5% AEP (1 in 20-year event) undefended outline
Hellifield Beck flood mapping study, 2013	4% AEP (1 in 25-year event) defended outline
Skipton FAS pre-scheme interim deliverables	No suitable outline available for use in FZ3b delineation.

Flood Zone 3a represents Flood Zone 3 that is not within Flood Zone 3b. The extent of Flood Zones 3a and 3b are displayed on the SFRA Maps in Appendix B.

4.2.3 Skipton Flood Alleviation Scheme

A flood alleviation scheme (FAS) is currently under construction in Skipton, which is accompanied by a detailed river modelling study. The scheme includes several flood storage areas in the vicinity of Skipton. The design of the scheme is in progress and has not yet been finalised, though detailed modelling outputs are expected to be produced once the scheme is complete. These should help define the areas that are now protected by the scheme and those still considered to be at risk following scheme completion.

As the scheme is still in progress at the time of writing, it has not been possible to fully assess current flood risk in Skipton. However, some interim deliverables have been produced to reflect the current level of flood risk within the town, and these have been included in the February 2016 version of the Environment Agency Flood Map for Planning that has been used in this SFRA.

As a result of the scheme it is expected that the areas at risk and areas benefitting from defences (ABDs) will change in the Skipton area. These changes, along with the designation of flood storage areas, are likely to impact on the areas defined as functional floodplain and other fluvial flood risk in the town, which may in turn affect the viability of potential/preferred development sites.

Once the FAS has been completed and modelling outputs produced, it is strongly recommended that this Level 1 SFRA is reviewed, in terms of fluvial flood risk and functional floodplain in Skipton in particular, and updated if deemed necessary.

4.2.4 Environment Agency Risk of Flooding from Rivers and the Sea

The Risk of Flooding from Rivers and the Sea dataset (RoFRS) is included on the SFRA Maps, providing supplementary information to assist the LPA in the decision making process for site allocation. However, this dataset is not suitable for use with any planning application nor should it be used for the sequential testing of site allocations. The Environment Agency's Flood Map for Planning should be used for Sequential testing of site allocations, as per the FRCC-PPG.

The 'Risk of Flooding from Rivers and the Sea' (RoFRS) is an additional Environment Agency dataset relating to fluvial flood risk. It considers risk from a different perspective, outlining the likelihood of flooding from rivers and the sea and taking into account the presence and effect of flood defences, predicted flood levels and ground levels. There are four categories to reflect the likelihood of flooding.

- High – greater than or equal to 1 in 30 chance (3.3%) in any given year
- Medium – less than 1 in 30 chance (3.3%) but greater than or equal to 1 in 100 chance (1%) in any given year
- Low – less than 1 in 100 chance (1%) but greater than or equal to 1 in 1,000 chance (0.1%) in any given year
- Very Low – less than 1 in 1,000 chance (0.1%) in any given year

4.2.5 Wider strategic studies

Additional information relating to flood risk can be found in strategic studies discussing flood risk considerations across the district. These include the Environment Agency's River Basin Management Plans (RBMPs) covering the district; the North West RBMP and the Humber RBMP, and four of their Catchment Flood Management Plans (CFMPs), along with North Yorkshire County Council's (NYCC) Local Flood Risk Management Strategy (LFRMS) and Preliminary Flood Risk Assessment (PFRA).

4.3 Surface Water Flooding

Surface water flooding, in the context of the SFRA, includes:

- Surface water runoff (also known as pluvial flooding)
- Sewer flooding

There are certain locations, generally within urban areas, where the probability and consequence of pluvial and sewer flooding are greater due to the complex hydraulic interactions that exist in the urban environment. Urban watercourse connectivity, sewer capacity, and the location and condition of highway gullies all have a major role to play in surface water flood risk.

Once an area is flooded during a large rainfall event, it is often difficult to identify the route, cause and source of flooding without undertaking further site-specific and detailed investigations.

4.3.1 Pluvial Flooding

Pluvial flooding of land from surface water runoff is usually caused by intense rainfall events which can be short in duration. During such events, the volume of rainfall can exceed infiltration rates extremely quickly, causing water to flow overland. In urban areas the drainage network may not be able to cope with such large volumes of water trying to enter the system. Excess water can flow along roads, through properties and pond in natural depressions. Areas at risk of pluvial flooding can therefore lie outside of the fluvial flood zones.

In this country, the design standard of new sewer networks is the 3.3% AEP (1 in 30-year) design flood event. Pluvial flooding typically occurs during events larger than, when sewer systems are often overwhelmed. Older sewer and highway drainage systems may have a capacity lower than the 3.3% AEP (1 in 30-year) design event. In areas where these systems are present, pluvial flooding may occur more frequently, during smaller flood events. The risk of flooding can also be higher due to the possibility of network failures, blockages or collapse.

4.3.1.1 Environment Agency Risk of Flooding from Surface Water (RoFSW)

The Environment Agency's latest national surface water flood map is called Risk of Flooding from Surface Water. The data is the 2013 updated Flood Map for Surface Water (uFMfSW) which has recently been renamed. It identifies areas at risk of flooding from surface water for several design rainfall events, based on detailed hydrological modelling using an edited digital terrain model with consideration of roughness due to land use. (Further details of the methodology applied to obtain the data can be found in the National Modelling and Mapping Method Statement, of May 2013). As the data has recently been renamed, in some documents the latest map may still be referred to as uFMfSW.

The Risk of Flooding from Surface Water map highlights areas which may experience localised flash flooding, even if watercourses are not overflowing. Surface water flood risk is spread widely across the Craven district and, due to the nature of surface water flooding, is not simply confined to lower lying areas in river valleys. For a comprehensive picture of surface water flood risk across Craven, the reader is referred to the SFRA interactive maps which include this dataset. Larger settlements in the district which have some risk of surface water flooding are summarised here; Bell Busk, Hellifield, High Bentham, Ingleton, Newby, Settle, Skipton, Glusburn, Sutton-in-Craven and Cross Hills. There are also large areas of rural and agricultural land at risk of surface water flooding, a large proportion of these are located along the course of two of the main rivers, the River Ribble and the River Aire.

4.3.1.2 Local Surface Water Risk

The NYCC Flood Response Coordination Plans are centred on the built up areas of the county. They give an overview of flood risk from a combination of sources, to inform those who respond to flooding events. Included in these plans are areas of known surface water flood risk which is based on local knowledge. This information has not been included on the maps produced for this SFRA, as the data is at a level more detailed than can be clearly represented.

As would be expected the majority of the areas at risk are located within the urban areas in the Craven district; Kildwick, Cross Hills, Glusburn, Sutton-in-Craven, Gargrave, Settle, Giggleswick, High Bentham, Low Bradley, Cononley and Skipton. There are also a few pockets of risk located in more rural areas, for example Pale Lane near Carleton, the A65 at Gildersleets (near Settle) and part of the B6160 near Bolton Bridge on the edge of the national park. For a detailed evaluation of risk at a local level it is recommended the plans are consulted.

4.3.2 Sewer Flooding

Urban areas have extensive networks of combined sewers serving residential and business properties and highways, conveying waste and surface water to treatment works. Combined Sewer Overflows (CSOs) provide an Environment Agency consented overflow release from the drainage system into local watercourses or large surface water systems during times of high flows. Some areas may also be served by separate waste and surface water sewers which convey waste water to treatment works and surface water into local watercourses.

Flooding from the sewer network can occur due to a number of reasons; flow entering the drainage system exceeds the available discharge capacity, the system becomes blocked or the system cannot discharge due to a high water level in the receiving watercourse. Flooding can also occur through surcharging of manholes; if there are pinch points or failures within the network restricting flows, then water can backup or collect in certain areas and may discharge through manholes. This can cause flooding of highways and properties. It must be noted that sewer flooding in 'dry weather' resulting from blockage, collapse or pumping station mechanical failure (for example), is the sole concern of the drainage undertaker.

Yorkshire Water and United Utilities are the water companies responsible for the management of the majority of the district's drainage network. The Airedale Drainage Commissioners are responsible for some sections of watercourse and drainage network assets in the Skipton area relating to the River Aire.

4.3.3 Locally Agreed Surface Water Information

Environment Agency guidance on using surface water flood risk information recommends that the LLFA, should:

"…review, discuss, agree and record, with the Environment Agency, Water Companies, Internal Drainage Boards and other interested parties, what surface water flood data best represents their local conditions. This will then be known as locally agreed surface water information".

NYCC used the Flood Map for Surface Water (FMfSW) dataset to define surface water flood information in the county for the purposes of the PFRA. This dataset was an earlier version of the Environment Agency surface water flood map, which has now been updated and recently renamed to Risk of Flooding from Surface Water. A detailed digital terrain model is used to route flows overland to produce a map of areas at risk.

NYCC and CDC should now consider the Risk of Flooding from Surface Water dataset (RoFSW) as their locally agreed surface water flood information. This is the most up-to-date surface water risk map available at the time of publication.

4.3.4 Critical Drainage Areas

The Town and Country Planning (Development Management Procedure) (England) Order 2010 defines a Critical Drainage Area (CDA) as:

"…an area within Flood Zone 1 which has critical drainage problems and which has been notified to the local planning authority by the Environment Agency".

Environment Agency guidance relating to Flood Risk Assessments[9] states that a Flood Risk Assessment (FRA) should be carried out for sites which fall into the category of Critical Drainage Areas, i.e. sites in Flood Zone 1 in areas with critical drainage problems as notified by the Environment Agency. In Critical Drainage Areas runoff associated with new development might increase flood risk from surface water drainage and/or sewer capacity. Proposed CDAs should be agreed between the council, the Environment Agency, drainage authorities (YW and UU) and the Airedale Drainage Commissioners.

Data made available for this study does not suggest the need to propose any critical drainage areas within the Craven district at this time.

4.4 Groundwater flooding

Groundwater flooding is caused by the emergence of water from beneath the ground, either at point or diffuse locations. It is usually localised and, unlike flooding from rivers and the sea, does not generally pose a significant risk to life as the rate at which the water level rises is slow. Groundwater flooding can however cause significant damage to property, especially in urban areas, and can pose further risks to the environment and ground stability.

There are certain conditions that increase the risk of groundwater flooding including prolonged rainfall, high in-bank river levels (particularly behind defences or embankments), artificial structures, groundwater rebound and minewater rebound. At particular risk are properties with basements or cellars, or properties that are located within areas deemed to be susceptible to this type of flooding. For developments within areas that are susceptible to groundwater flooding, SuDS are generally not suitable. This is not always the case however, detailed site investigation and risk assessment at the FRA stage will determine suitability for SuDS.

4.4.1 Environment Agency Areas Susceptible to Groundwater Flooding (AStGWF)

The Environment Agency's national dataset, Areas Susceptible to Groundwater Flooding (AStGWF), is the main source of information used to assess the future risk of groundwater flooding. It should be noted that this is a low resolution dataset which is not suitable for planning considerations at a site-specific level. It should be used simply to highlight the need for further investigation as to the possibility of groundwater flooding.

9 https://www.gov.uk/guidance/flood-risk-assessment-in-flood-zone-1-and-critical-drainage-areas

The AStGWF map uses four susceptibility categories to show the proportion of each 1 km grid square where geological and hydrogeological conditions indicate that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring. The AStGWF is shown on the SFRA Maps (Appendix B).

4.5 Canal and Reservoir Flood Risk

4.5.1 Canals

The Leeds Liverpool canal runs through rural parts of the Craven district and also passes directly through Skipton town centre. The canal network is owned and maintained by the Canal & River Trust. Data relating to their assets is openly available online. The SFRA maps show the route of the canal along with the locations of locks and embankments that are managed and maintained by the Canal & River Trust.

The risk of flooding along a canal is considered residual and is dependent on a number of factors. As canals are manmade systems that are heavily controlled, it is unlikely they will respond in the same way as a natural watercourse during a storm event. Flooding is more likely to be associated with residual risks, similar to those associated with river defences, such as overtopping of canal banks, breaching of embanked reaches or asset (gate) failure as highlighted in Table 4-3. Canals can also have a significant interaction with other sources, such as watercourses that feed them and minor watercourses or drains that cross underneath. They can act as pathways to rapidly convey volumes of water during a flood event. The Environment Agency Flood Map for Planning indicates risk along the course of the canal through Skipton.

Table 4-3: Canal flooding mechanisms

Potential Mechanism	Significant Factors
Leakage causing erosion and rupture of canal lining leading to breach	Embankments Sidelong ground Culverts Aqueduct approaches
Collapse of structures carrying the canal above natural ground level	Aqueducts Large diameter culverts Structural deterioration or accidental damage
Overtopping of canal banks	Low freeboard Waste weirs
Blockage or collapse of conduits	Culverts

The risks associated with these events are also dependent on their potential failure location. The consequence of flooding is higher where highways or properties are adjacent to the canal, as floodwater here would have a more significant impact Flood risk is likely to be greater in areas adjacent to raised embankments. As canals can have extensive sections (pounds) with no control structures, the consequence of failure is increased, as flows will only cease when the supply is exhausted. Stop plank[10] (log) arrangements, stop gates and the continued inspection and maintenance of such assets by the Canal & River Trust help to manage the overall risk of flooding.

4.5.2 Reservoirs

A reservoir can usually be described as an artificial lake where water is stored for use. Some reservoirs supply water for household and industrial use, others are used for recreational purposes, for fishing for example. Like canals, the risk of flooding associated with reservoirs is residual and is associated with failure of reservoir outfalls or breaching. This risk is reduced through regular maintenance by the operating authority. Reservoirs in the UK have an extremely good safety record with no incidents resulting in the loss of life since 1925.

The Environment Agency is the enforcement authority for the Reservoirs Act 1975 in England and Wales. All large reservoirs must be regularly inspected and supervised by reservoir panel

10 Wooden boards for dropping into grooves at a narrows; to permit drainage for maintenance work on a canal section or to isolate a leaking section

engineers. The water companies have a duty of care to prevent flooding from reservoirs. Local Authorities are responsible for coordinating emergency plans for reservoir flooding and ensuring communities are well prepared. Local Authorities should work with other members of the North Yorkshire Local Resilience Forum to develop these plans. See Section 9.2.2 for information on the North Yorkshire Local Resilience Forum of which CDC and NYCC are a part of.

A number of small reservoirs exist in the SFRA area, mostly located in the headwaters some distance upstream of settlements. There are however several reservoirs in the Craven district (or close to the boundary) which are close to settlements. These provide a potential source of residual flood risk to those settlements. These are;

- Embsay - on Embsay Beck upstream of Embsay. This is located in the National Park close to the CDC boundary. Nearby settlements are Embsay and Skipton downstream.
- Whinny Gill - In Skipton, on the eastern side. This is a raised reservoir with embankments on two sides.

4.5.3 Environment Agency Reservoir Flood Maps

The Environment Agency has prepared reservoir flood maps for all large reservoirs that they regulate under the Reservoirs Act 1975 (reservoirs that hold over 25,000 cubic meters of water). The maps show the largest area that might be flooded if a reservoir were to fail and release the water it holds but they do not give any information about the depth or speed of the flood waters. CDC emergency planners should have access to this information so they can develop effective emergency plans. Due to the sensitivity of the information, detailed data on reservoirs is not provided within this SFRA.

Reservoir flood maps can be viewed online only and can be found on the Environment Agency's website[11]. The FWMA updated the Reservoirs Act and targeted a reduction in the capacity at which reservoirs should be regulated from 25,000m³ to 10,000m³. This reduction is, at the time of writing, yet to be confirmed meaning the requirements of the Reservoirs Act 1975 should still be adhered to.

4.6 Historical Flooding

Historical flooding information provides an overview of parts of the district where flooding has been observed and recorded in the past. It can be used to verify that fluvial flooding extents derived from modelling studies are reasonable and to identify where flooding occurs due to other sources, such as surface water runoff. For the Craven district, historical flooding information is available from a variety of sources. The most comprehensive record is the Environment Agency's historic flood map, which is shown on the SFRA maps in Appendix B. The following sections provide details of historical flooding in the Craven district with reference to the information source.

4.6.1 Environment Agency Historic Flood Map

The Historic Flood Map (HFM) shows the combined extent of past fluvial, tidal and groundwater flooding. It does not specify particular details regarding the source of flooding, return period or the date of flood. These extents are shown on the accompanying SFRA Maps in Appendix B.

The HFM shows that flooding in the past has occurred alongside major watercourses in the district, indicating fluvial sources. Extensive areas alongside the River Aire between Gargrave and Silsden have been affected. For the majority of this stretch, it is rural and agricultural land that is flooded. However, some properties and transport infrastructure have been affected in parts of Gargrave, Skipton, Cononley, Cross Hills and Kildwick. Smaller watercourses are likely to have contributed to the flooding in some areas, particularly in Skipton.

Elsewhere, riverside fields and a few riverside properties have been affected alongside the River Ribble in parts of Settle and the River Aire from Bell Busk to the A65 (Coniston Bridge). In the centre of Hellifield, the A65 and many properties either side, are shown to have flooded in the past.

11 http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=reservoir

The source of flooding is not certain. On the edge of the National Park infrastructure has historically been flooded near Bolton Bridge alongside the River Wharfe.

4.6.2 Fluvial modelling study reports

Fluvial modelling studies are generally conducted in areas which are known to be at flood risk, informed by historic flooding events. Reports from such studies can provide information on the nature and severity of localised historic flooding. For example, the Glusburn Beck SFRM study (2008) highlighted the beck as having a history of flooding with properties flooded in Glusburn in 2004 and flooding due to a sewer in the Sutton area. The Settle and Low Moor FM study (2006) discussed flooding of properties in a recent event of 1999. For more specific details, the user is referred to the reports from these studies. It should be noted however, that these documents reflected the risk at the time of their production. The risk of flooding may have changed.

Results of fluvial modelling studies conducted for the Environment Agency are generally used to inform the Environment Agency flood map. For an assessment of the current risk in the Craven area the reader is referred to the relevant sections of this updated SFRA report which look at the latest available data.

4.6.3 Craven Flooded Properties

This data gives an indication of where significant flooding incidents have occurred in the Craven district in the past, based on records from CDC, NYCC and the North Yorkshire Fire and Rescue Service. The information recorded varies, for some incidents property level information is available. Due to the sensitivity of this data and the varying level of detail provided, specific information is not given here and the data has not been included on the SFRA maps. This section provides a summary of the data, for further details the reader is referred to the data itself.

Historic flooding across the district has been attributed to a range of sources; fluvial flooding, surface water runoff and drainage infrastructure problems. It has affected both residential and commercial properties. 18 incidents were recorded in 2012, and 124 in 2015, with a large proportion of the 2015 incidents involving internal flooding of properties (91 out of 124 or 73%).

Many of the larger settlements within the district have been affected; Skipton, Ingleton, Low and High Bentham, Gargrave, Cowling, Low Bradley, Cononley, Glusburn, Cross Hills, Sutton, Farnhill, and Kildwick. Incidents were also recorded in numerous towns and villages; Carleton, Lothersdale, Rathmell, Burton in Lonsdale, Newby, Lawkland, Giggleswick, Ickornshaw.

Some of the district's roads have been affected by flooding in the past; most notably the A65 at Coniston Cold, the A6068 near Glusburn, and smaller roads near Gargrave and Carleton.

4.6.4 Historic Surface Water Flooding

The NYCC Flood Response Coordination Plans give an overview of flood risk from a combination of sources, to inform those who respond to flooding events. As well as showing Environment Agency data for fluvial and surface water flood risk, the plans identify localised areas with known surface water flood risk based on local knowledge. This information from local knowledge has not been included on the maps produced for this SFRA, as the data is at a level more detailed than can be clearly represented on the maps. The local pockets identified reflect historic flooding and also potential areas of current risk. The areas at risk are summarised in the Surface Water Flooding section of this report (section 4.3).

4.6.5 Historic Sewer Flooding

United Utilities and Yorkshire Water provided data from their DG5 Register. This records, at an individual property level, flooding incidents which are attributable to water company controlled sewer networks, either foul and/or surface water sewers. The data therefore gives an indication of the number of properties at risk of either internal or external flooding from sewers.

A small number of properties are reported to have been affected by internal flooding in the BD24 0 and BD24 9 areas (the Settle area). These incidents have occurred infrequently. In the LA2 7 postcode area (Low and High Bentham) a small number of properties have been affected by external flooding. This area is affected more frequently, with 10 flooding incidents in the last 10 years.

In the remaining areas of the Craven district, Yorkshire Water had no recorded incidents of flooding from sewers.

4.6.6 Historic Canal Flooding

When preparing this report, no strong anecdotal evidence for canal flooding in the Craven district came to light. Although the Leeds-Liverpool canal passes through Skipton town centre, the canal is not believed to be a primary mechanism for flooding in Skipton. In light of this, no further information was sought from the Canal & River Trust regarding records of historic breaches and/or overtopping incidents.

4.7 Flood Risk Management

Existing Flood Risk Management (FRM) assets are discussed here, along with previous and proposed FRM schemes in the district. These will have an impact on the type, form and location of new development or regeneration within the council area. The location, condition and design standard of existing assets will have a significant impact on flood risk. Future schemes in areas of high flood risk carry the possibility of reducing the probability of flooding and overall level of risk.

4.7.1 Environment Agency Assets

The Environment Agency owns and maintains a network of flood defence infrastructure across the country, but also carries out other flood risk management activities, that help reduce the probability of flooding and also the consequences. The Environment Agency;

- Maintains and improves existing flood defences, structures and watercourses.
- Monitors works by riparian owners which may be detrimental to flood risk and enforces adjustments or maintenance to maximise benefits and minimise consequences.
- Identifies and promotes new flood alleviation schemes (FAS) where appropriate.
- Works with local authorities to influence the location, layout and design of new and redeveloped property, ensuring that only appropriate development is permitted relative to the scale of flood risk.
- Operates Floodline Warnings Direct and warning services for areas within designated Flood Warning Areas (FWA) or Flood Alert Areas (FAA). Environment Agency FWAs are shown on the SFRA Maps in Appendix B.
- Promotes awareness of flooding to organisations, communities and individuals to ensure they are sufficiently prepared in the event of flooding.
- Promotes resilience and resistance measures for properties that are currently at flood risk, or may be in the future as a result of climate change.

Information on flood defences was available from the Environment Agency open datasets and a GIS file supplied by the Environment Agency for the north-west area of the Craven district.

In the north-west the River Ribble has raised defences, in the form of embankments, for five or six kilometres in the reach between the A65 south of Settle to the B6478 near Wigglesworth and Long Preston. These are understood to be designed to offer a 1.4% AEP (1 in 70-year event) standard of protection to the surrounding rural or agricultural land. There are also several short sections of walls or embankments protecting properties within Settle. A private defence exists on a tributary of the River Wenning near Eldroth.

In the south-east of the district there are defences along the banks of the River Aire for a large proportion of the reach between Gargrave and Cross Hills, with the exception of the area between the A59 north of Skipton and Carleton-in-Craven in the south. These assets defend rural or agricultural land. The standard of protection is not known. Defences also exist in some parts of Skipton to protect a small number of properties. It is likely that the Environment Agency have ownership of these defences.

As mentioned in Section 4.2.3, an Environment Agency Flood Alleviation Scheme (FAS) is currently under construction in Skipton. This involves the installation of flood defence walls in several areas of the town and also flood storage areas upstream of the town centre on the

watercourses which flow through Skipton; Eller Beck and Waller Hill Beck. Full details of the scheme and its benefits are not available at the time of publication.

4.7.2 NYCC Assets

North Yorkshire County Council will own and maintain a number of assets throughout the Craven district including culverts, bridges, gullies, weirs and trash screens. The majority of these will be on ordinary watercourses, either in rural areas or smaller urban areas where the watercourses may have been culverted or diverted. These assets can have flood risk management functions, and should they become blocked or fail, may have an effect on flood risk.

As LLFA, NYCC have FWMA duties. One of these is to maintain a register of structures or features which are considered to have a significant effect on flood risk (an Asset Register). As a minimum, details of ownership and condition should be included. CDC as an RMA, has duties to pass on relevant information to the LLFA and will therefore need to be involved in collecting data for the asset register and maintaining assets within the region.

The Asset Register should include feature type, a description of principal materials, location, dimensions and condition grade. It should also outline how NYCC intend to manage these assets or features, including their ongoing maintenance programme. NYCC should prioritise and focus maintenance or upgrades on assets located in a high risk area or deemed to have the potential to effect flood risk. At the time of writing NYCC are still developing their FRM asset register, therefore it has not been made available for this assessment. However, the register can be viewed by the public upon request.

4.7.3 Water Company Assets

Water company assets include wastewater treatment works, combined sewer overflows, pumping stations, detention tanks, sewer networks and manholes.

Within the district of Craven, as with much of the country, the sewerage infrastructure is likely to be based on Victorian sewers, which pose a risk of localised flooding. These drainage systems may be under capacity for present day needs and/or may be subject to blockages, which can lead to localised flooding of roads and property. Yorkshire Water and United Utilities are responsible for the management of the urban drainage system, which includes surface water and foul sewerage. Under the Private Sewer Transfer in 2011, sewers connected to the public sewer network were transferred to the water companies. There may still be some private surface water sewers in the district. Surface water sewers discharging to watercourses did not transfer to the ownership of the water companies, unless adopted under a Section 104 adoption agreement.

4.7.4 Flood Risk Management Work Programmes

The Environment Agency provided the Flood and Coastal Erosion Risk Management (FCERM) Development Programme, which gives details of ongoing and proposed flood risk management work programmes. There are two ongoing programmes and one proposed in the Craven district. The Skipton FAS is under construction and the Environment Agency's programme looking at Yorkshire culverts. In the future, works are proposed for Skipton's Coach Street culvert on Eller/Embsay Beck (2018 - 2021).

4.8 Application of the Sequential Test to potential development sites

4.8.1 Potential and preferred sites

Craven District Council have identified a number of potential development sites drawing, as suggested in the PPG, on a broad range of sources including the SHLAA, existing planning commitments and sites promoted through a "call for sites" exercise (carried out in 2014 as part of the pre-publication of the Local Plan). The inclusion of a site in the list of potential sites does not mean it will be developed, it will ultimately depend on the suitability for development, availability and the likelihood of development being financially viable.

There are currently 80 sites in the list of potential development sites (January 2017), of which the majority are proposed for housing (63 sites). The remaining sites are proposed for either employment (11) or mixed use (6).

The NPPF and PPG advocate that land assessments for housing and economic development should be undertaken as part of the same exercise in order that sites may be allocated for the most appropriate use. In line with this guidance Craven District Council has carried out the land assessment for housing and employment sites in a joined up manner, and has identified which of the potential sites should be earmarked as preferred sites for development on this basis. CDC have further refined the preferred sites into net developable areas, with the aim of steering development away from the higher risk Flood Zone areas within the sites if possible.

As part of this SFRA, an analysis has been undertaken on the list of preferred sites (as well as the net developable areas) in order to quantify flood risk and provide recommendations of how the flood risk implications should be dealt with within the context of planning policy and development of the Local Plan. This analysis has been achieved by application of the Sequential Test in line with PPG. The outcomes of this assessment are documented in Appendix A and presented in the accompanying Development Site Assessment spreadsheets.

4.8.2 Specific considerations

Prior to the analysis, the current functional floodplain extent was derived. Delineation of the functional floodplain (Flood Zone 3b) was based on that defined for the previous SFRA (2010), in conjunction with recent flood extent envelopes from Environment Agency mapping studies. The mapping studies used in the delineation of the current functional floodplain are:

- Eller Beck Section 105 studies (2000)
- Lune 2 Tributaries Flood Risk Mapping Study (2006)
- Settle and Low Moor Flood Mapping Study (2006)
- Upper Aire Strategy (2008)
- Glusburn Beck SFRM (2008)
- Clapham Beck (2011)
- Hellifield Beck (2013)

The FZ3b extent was derived by combining the previous FZ3b with the extents of the above model flood outlines and adding to this any areas designated by the Environment Agency as Flood Storage Areas (FSAs) and any areas falling within the Environment Agency's Historic Flood Map (HFM) up to the limits of Flood Zone 3.

4.8.3 Accounting for future climate change

The flood risk designations utilised in this report relate to the current situation, because the Flood Map for Planning and the Risk of Flooding from Surface Water Map do not incorporate the impacts of climate change.

However, because lifetimes for residential developments can be significant, policies for new development must be based on future levels of risk, rather than those that apply currently. It is widely accepted and understood that climate change is likely to lead to increased risks of flooding in the future, with risks increasing over time. This will have implications for both the type of development that is appropriate according to its vulnerability to flooding and design standards for any SuDS or mitigation schemes proposed.

The impact of climate change on flood risk won't be the same everywhere, however. For example, risks are expected to increase more in certain parts of the country. Local differences in the scale of change may be governed by geographic conditions. For very flat floodplains, where flood extents can increase significantly for a small increase in flood peak magnitudes, locations currently within lower risk zones could in future be re-classified as lying within a higher risk zone as a result of climate change. Residential development in such areas may therefore not be appropriate without suitable flood mitigation measures (such as flood resilient or resistant houses for instance). In more well-defined floodplains, increased flows will primarily result in increased flood depths, thereby influencing building type and design (e.g. having elevated floor levels) for any new development that takes place.

In the absence of any published information on exactly how Flood Zone boundaries might change as a result of climate change, a workable assumption is that the current day Flood Zone 2 extent will be entirely taken up by Flood Zone 3 in the future. This approach, whilst precautionary, is considered to be a pragmatic methodology for the purposes of a Level 1 SFRA, particularly as it is consistent with professional experience which indicates that the flood magnitude equal to the present day 0.1% AEP (1 in 1000-year) event could occur at a 1% AEP (1 in 100-year) frequency in the near future. As such, for any sites within Flood Zone 2, the possibility of these sites being within Flood Zone 3 at some point in the future should be considered, depending on the expected life time of the development. This issue only becomes problematic if development needs for housing and employment cannot be accommodated within the present-day Flood Zone 1.

A more detailed assessment of the impacts of climate change could be carried out as part of a Level 2 SFRA or site-specific FRA. This should consider the updated climate change allowances (published by the Environment Agency in February 2016)[12] in order to provide an appropriately robust response to the uncertainty about climate change impacts on peak river flow rates and rainfall intensities. The Environment Agency's specified peak river flow allowances vary between River Basin Districts; for the Humber RBD they range between +10% and +20% for the period covered by the Local Plan, the range is +15% to +20% for the North West RBD. These allowances rise to as much as +50% by the 2080's for the Humber RBD and +70% for the North West RBD (Table 4-4). Peak rainfall rates may be increased by the allowances stated in Table 4-5.

Table 4-4: Recommended Peak River Flow Allowances for the relevant River Basin Districts

Allowance Category	Total Potential Change Anticipated for…		
	2020s (2015-2039)	2050s (2040-2069)	2080s (2070-2115)
Humber (River Aire and River Wharfe tributaries)			
Upper end	+20%	+30%	+50%
Higher central	+15%	+20%	+30%
Central	+10%	+15%	+20%
North West (River Ribble and River Lune tributaries)			
Upper end	+20%	+35%	+70%
Higher central	+20%	+30%	+35%
Central	+15%	+25%	+30%

Table 4-5: Peak Rainfall Intensity Allowance in Small and Urban Catchments for England

Allowance Category	Total Potential Change Anticipated for…		
	2015-2039	2040-2069	2070-2115
Upper end	+10%	+20%	+40%
Central	+5%	+10%	+20%

The Environment Agency will also require consideration, if appropriate, of the 'high++ allowances' for peak river flows and mean sea level rise where a development is considered to be very sensitive to flood risk and has an intended lifetime that extends into the next century. This could include infrastructure projects or developments that significantly change existing settlement patterns. The high++ allowances can be found in the Environment Agency's *Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities*[13], which uses science from UKCP09. This guidance is based on Government's policy for climate change adaptation, and is specifically intended for projects or strategies seeking Government Flood Defence Grant in Aid (FDGiA) funding.

However, RMAs in England may also find it useful in developing plans and making Flood and Coastal Erosion Risk Management (FCERM) investment decisions even if there is no intention of

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

13 Environment Agency Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities

applying for central government funding. This is important for any future large scale infrastructure used to support the delivery of strategic sites such as flood defence schemes.

Although it is anticipated that increases in river flows will lie somewhere within the range of the central to upper end estimates of the February 2016 allowances, more extreme change cannot be discounted. The high++ allowances can be used to represent more severe climate change impacts and help to identify the options that would be required. The UKCP09 high++ allowances for peak river flows are presented in Table 4-6.

Table 4-6: UKCP09 High++ Allowances for Peak River Flow for the relevant River Basin Districts

River Basin District	Total Potential Change Anticipated for…		
	2020s (2015-39)	2050s (2040-69)	2080s (2070-2115)
Humber (Aire and Wharfe tributaries)	+20%	+35%	+65%
North West (Ribble and Lune tributaries)	+25%	+45%	+95%

Modelled climate change outputs, using the February 2016 allowances, are not available at the time of writing for this Level 1 SFRA. However, any Level 2 assessment following on from this Level 1, or any site-specific FRA, could involve the modelling of appropriate climate change events, where fully functioning Environment Agency hydraulic models are available.

4.8.4 Outcomes

Of the 80 preferred development sites, only five have parts of their footprints within Flood Zone 3b, and a further 17 have parts within Flood Zone 3a. 25 sites have parts of their footprint in Flood Zone 2. In terms of other sources of flooding, 45 of the preferred sites are also at high risk from surface water flooding, however only six of these have a surface water impact on more than 10% of the site.

Application of the Sequential Test showed that the vast majority of the sites in the allocation would be permitted for development. 20 sites appear to be directly suitable for permitted development as they have minimal implications for flood risk. A further 43 sites were deemed to be suitable for inclusion in the allocation subject to an FRA being able to demonstrate no significant impacts of flooding from other sources. Two sites were identified as needing to be withdrawn from the preferred list as a significant proportion of the footprint was within Flood Zone 3b. One site was identified as needing to be withdrawn as a significant proportion of the site is at high risk of surface water flooding. Five sites were identified as needing to be subject to the Exception Test. Nine sites were identified as having the potential to pass the Sequential Test following site boundary adjustments (to exclude parts of the footprint at higher flood risk).

5 Conclusions and Recommendations

5.1 Conclusions

This SFRA is designed to provide a planning tool relating to flood risk and development for Craven District Council. It has consulted key flood risk stakeholders, namely the Environment Agency, United Utilities and North Yorkshire County Council Lead Local Flood Authority, to collate available and relevant flood risk information on all sources into one comprehensive assessment. Alongside this report, the SFRA includes a set of Development Site Assessment spreadsheets (Appendix A), which illustrate the level of risk to sites and give subsequent development recommendations, plus a suite of interactive GeoPDF flood risk maps (Appendix B) showing risk across the district from various sources of flooding.

The flood risk information, assessment, guidance and recommendations of this SFRA will provide strategic planners with the evidence base required to apply the Sequential and Exception Tests, as required under the NPPF. Planners will be able to demonstrate that a risk based, sequential approach has been applied in the preparation of their development plans and documents. This will allow for a sustainable and robust Local Plan.

The aim of the sequential approach is the avoidance of high flood risk areas, however in urban locations where growth and regeneration are often required, this may not always be possible. This SFRA aims to provide the necessary links between spatial development, wider flood risk management policies, local strategies/plans and on the ground works by combining all available flood risk information into one assessment. As this is a strategic study, detailed local information on flood risk is not fully accounted for. For an in-depth assessment of specific areas/sites, a Level 2 SFRA would usually be undertaken following the completion of a Level 1 assessment, if required.

5.2 Planning Policy and Flood Risk Recommendations

Table 5-1 outlines planning policy recommendations, which will enable CDC to translate the Level 1 SFRA information into meaningful Local Plan policy for flood risk and water management.

Table 5-1: Recommendations for local planning policy

Recommendation	Details
1. No development within Flood Zone 3b	As per the NPPF and FRCC-PPG, no development should be permitted within Flood Zone 3b, unless in exceptional circumstances (such as for essential infrastructure or water compatible development). Development must not impede the flow of water within FZ3b or reduce the volume available for flood water storage. See Tables 1 to 3 of the FRCC-PPG.
2. Consider surface water flood risk	Consider surface water flood risk alongside fluvial risk, including possible withdrawal, redesign or relocation for sites at significant surface water risk. FRAs should always consider surface water flood risk management and options for on-site flood storage.
3. Adoption of a sequential approach to site allocation and site layout	A sequential approach to site allocation must be followed by CDC planning teams when allocating land in Local Plans or determining planning applications for development. Both developers and CDC should follow a sequential approach to site layout in order to ensure sustainable development. This SFRA, the NPPF and FRCC-PPG should be consulted throughout this process. The overall aim of the Sequential Approach should be to steer new development to low risk Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, the flood risk vulnerability of land uses and reasonably available sites in Flood Zone 2 should be considered, applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 or 2, should the suitability of sites in higher risk Flood Zone 3 be considered. This should take into account the flood risk vulnerability of land uses and the likelihood of meeting the requirements of the Exception Test, if required.

4: Requirement for a site-specific Flood Risk Assessment	Developers should be required to undertake a site-specific FRA if the proposed development site meets any of the following criteria: • Within Flood Zone 3a or Flood Zone 2 • Within Flood Zone 1 and 1 hectare or greater in size • At risk from surface water flooding • Situated in an area currently benefitting from defences • Situated within 20 metres of the bank top of a Main River • Situated over a culverted watercourse or where development will be required to control or influence the flow of any watercourse Before deciding on the scope of the FRA, this SFRA should be consulted along with the LPA, LLFA and Environment Agency. The FRA should be submitted to and approved by the LPA including suitable consultation with the LLFA and the Environment Agency.
5: Use of appropriately sourced of SuDS	The interim national standards published in March 2015 required that SuDS are implemented for all major developments of 10 or more residential units or an equivalent commercial development. The scoping and design of a SuDS, as part of a site-specific FRA, must be included within the early stages of the site design in order to incorporate appropriate SuDS within the development. Craven District Council, LLFA (NYCC), the relevant water company and the Airedale Drainage Commissioners (if appropriate) must be consulted during the site design stage and the FRA must be submitted to and approved by the LPA, considering all consultation with key stakeholders. Further the Environment Agency should be consulted with regards to surface water if surface water is being discharged from the site to a Main River.
6: Phasing of development	Craven District Council should adopt a policy of phasing development in order to avoid any cumulative impacts of flood risk. Using a phased approach to development, should ensure that any sites at risk of causing flooding to other sites are developed first in order to ensure flood storage measures are in place before other sites are developed, thus contributing to a sustainable approach to site development. It may be possible that flood mitigation measures put in place at sites upstream could alleviate flooding at downstream or nearby sites.
7: Conditions on planning permission for at risk sites	Planning permission for at risk sites should only be granted by Craven District Council where a site-specific FRA shows that: • The NPPF and FRCC-PPG have been referenced together with appropriate consultation with the LLFA, the Environment Agency, Yorkshire Water, United Utilities and the IDB, where applicable • The effects of climate change have been taken into account using the Environment Agency's February 2016 allowances. Modelled climate change outputs are not available and have not been used in this update • There is no loss in floodplain storage resulting from the development • The development will not increase flood risk elsewhere • There is no adverse effect on the operational functions of any existing flood defence infrastructure • Proposed resistance / resilience measures designed to deal with current and future risks are appropriate • Appropriate SuDS techniques have been considered and are to be incorporated into the design of the site, where applicable • The development will be safe and has passed the Exception Test, if applicable.

5.3 Recommendations for Further Work

The SFRA has developed into more than just a planning tool. Sitting alongside the North Yorkshire LFRMS and PFRA, it can be used to provide a much broader and inclusive vehicle for integrated, strategic and local flood risk management and delivery.

During the production of this Level 1 SFRA it has not been possible to assess the impact on flood risk that the Skipton Flood Alleviation Scheme (FAS) will have, as the scheme is currently under construction. The FAS is accompanied by a modelling study which will produce revised model outputs and information following completion of the scheme. It is strongly recommended that this Level 1 SFRA (and the current functional floodplain) is reviewed once the FAS is complete and the modelling study has reported its outcomes.

If there is a significant flood affecting the area an immediate review of the SFRA should be undertaken. This SFRA should be updated once Environment Agency river models have been updated for the newly released climate change allowances. In the meantime, all site-specific flood risk assessments should consider the new Environment Agency climate change allowances.

There are a number of plans and assessments listed in Table 5-2 that would be of benefit to CDC (and/or NYCC as the LLFA) in developing the flood risk evidence base to support the delivery of CDC's Local Plan or to help fill critical gaps in flood risk information.

Table 5-2: Recommended further work for CDC and/or NYCC

Type	Study	Explanation	Timeframe
Understanding of local flood risk	Environment Agency Flood Risk Mapping updates	Environment Agency modelling updates of older models. Updates of Flood Map for Planning, particularly on completion of the Skipton FAS.	Medium term Short term
	Level 2 SFRA	Further, more detailed assessment of flood risk to high risk sites, as notified by this SFRA	Short term
	SWMP / drainage strategy	For those high surface water risk sites/areas as notified by this Level 1 SFRA. For Skipton as recommended in the River Aire CFMP.	Short term Medium term
Climate change (February 2016 allowances)	Level 2 SFRA	Modelling of climate change, where applicable, if availability of Environment Agency models allows.	Short term
CDA designation	Level 2 SFRA	Exploration of the possibility of designating official CDAs as notified to the LPA by the Environment Agency or identification of areas of critical drainage for use in CDC's Local Plan.	Short term
Flood storage	Community Infrastructure Levy (CIL)	For new developments, GI assets can be secured from a landowner's 'land value uplift' and as part of development agreements. The LPA could include capital for the purchase, design, planning and maintenance of GI within its CIL programme.	Short term
Data Collection	Flood Incident Data	NYCC, in collaboration with CDC, has a duty to investigate and record details of locally significant flood events within the county. General data collected for each incident, should include date, location, weather, flood source (if apparent without an investigation), impacts (properties flooded or number of people affected) and response by any RMA.	Short Term / Ongoing
	FRM Asset Register	NYCC should continue to update and maintain their flood risk management register of structures and features which are considered to have an effect on flood risk. This should be shared with CDC.	Ongoing

Type	Study	Explanation	Timeframe
Risk assessment	Asset Register Risk Assessment	NYCC, in collaboration with CDC, should carry out a strategic assessment of structures and features on the FRM Asset Register to inform capital programme and prioritise maintenance programme.	Short Term
Capacity	SuDS review / guidance	CDC should identify internal capacity required to deal with SuDS applications, set local specification and set policy for adoption and maintenance of SuDS.	Specification adopted
Partnership	Yorkshire Water and United Utilities	CDC should continue to work with YW and UU on sewer and surface water projects.	Ongoing
	Environment Agency	NYCC/CDC should continue to work with the Environment Agency on fluvial and tidal flood risk management projects. CDC should also identify potential opportunities for joint schemes to tackle flooding from all sources.	Ongoing
	Canal & River Trust	NYCC / CDC should continue to work with the Canal & River Trust to understand the residual risks associated with the Leeds Liverpool Canal.	Ongoing
	Community	Continued involvement with the community through NYCC's and CDC's existing flood risk partnerships.	Ongoing

5.3.1 Level 2 SFRA

The Council should review the sites where they expect the main housing numbers and employment sites to be delivered, using the Development Site Assessment spreadsheets and supporting information (Appendix A) and SFRA maps (Appendix B) provided alongside this report. A Level 2 SFRA will be required if a large site, or group of sites, are within Flood Zone 3 and have strategic planning objectives, which mean they cannot be relocated or avoided. A Level 2 SFRA may also be required if the majority of the sites are within Flood Zone 2 or are at significant risk of surface water flooding. Residual flood risk should also be taken account of when considering options for future work.

Due to the complexity of flood risk in the district, and in Skipton in particular, it is recommended that a Level 2 SFRA should be considered. A Level 2 SFRA should build on the source information provided in this Level 1 assessment. It should show that a site will not increase risk to others, will be safe once developed, and will pass the Exception Test, if required. A Level 2 study may also assess locations and options for the implementation of open space, or Green Infrastructure, to help manage flood risk in key areas. A Level 2 assessment can be used to model the February 2016 climate change allowances, where suitable current Environment Agency models are available.

The LPA will need to provide evidence in their Local Plan to show that the housing numbers (and other sites) can be delivered. The Local Plan may be rejected if a large number of sites require the Exception Test to be passed but with no evidence that this will be possible.

Once all sites within this Level 1 assessment have been reviewed by the LPA then further advice or guidance should be sought to discuss possible next steps.

Part 2: Flood Risk within the Planning Process

6 The Planning Framework and Flood Risk Policy

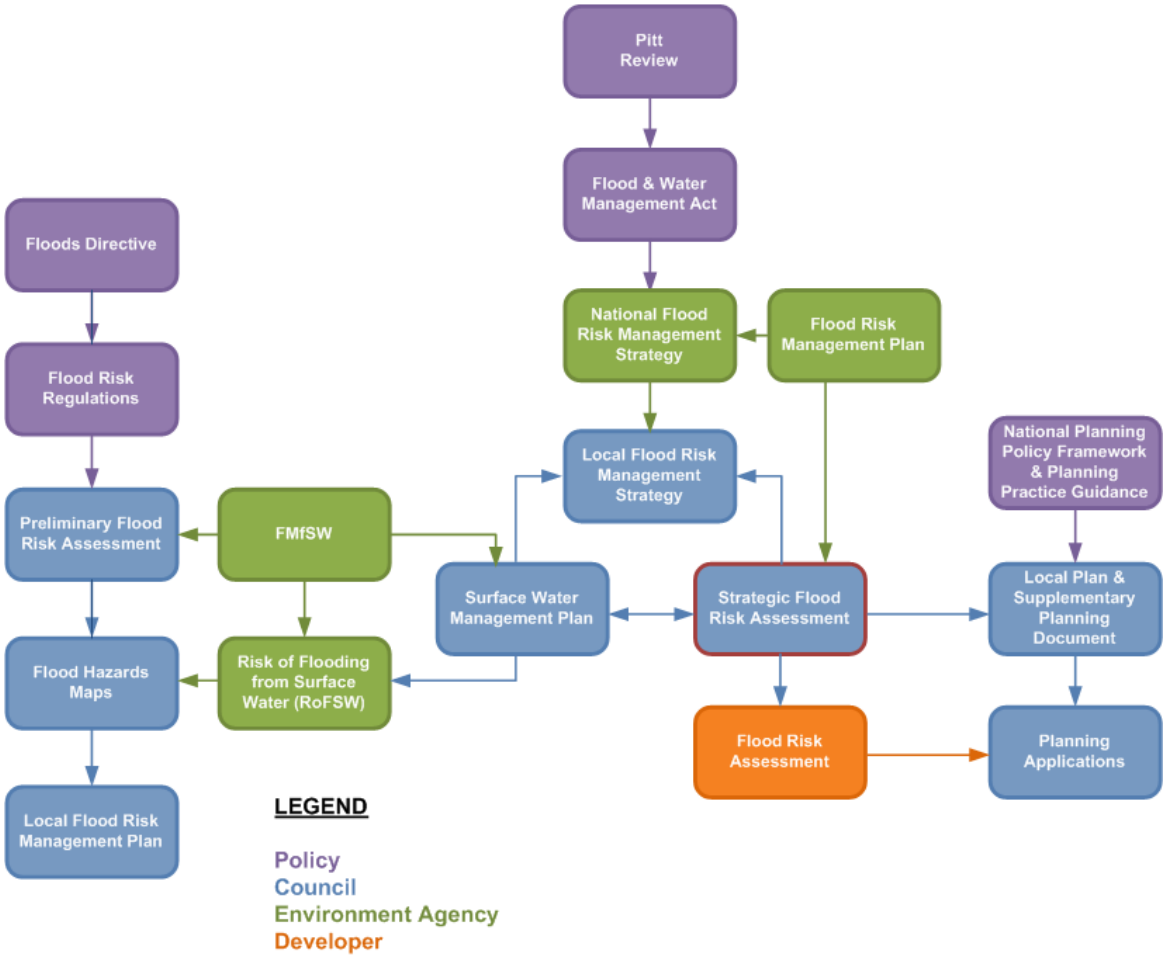
6.1 Introduction

An overview of the key planning and flood risk policy documents that have shaped the planning framework is given here. This section also outlines CDC's responsibilities and duties in respect to managing local flood risk, which include fulfilling the requirements of the Flood Risk Regulations (FRR) 2009 and the Flood and Water Management Act (FWMA) 2010.

Figure 6-1 illustrates the links between legislation, national policy, statutory documents and assessment of flood risk. The figure shows that whilst the key pieces of legislation and policy are separate, they are closely related. In implementation of these, the relevant authorities should aim to provide a comprehensive and planned approach to asset record keeping and improving flood risk management within communities.

It is intended that the non-statutory SWMPs and SFRAs will provide much of the base data required to support the delivery of the council's statutory flood risk management tasks, and provide support to local authorities in developing capacity and effective working arrangements. In addition, these documents inform Local Flood Risk Management Strategies (LFRMS) and Local Plans, which in turn help develop flood risk management infrastructure and sustainable new development at a local level. This SFRA should be used to inform CDC's Local Plan and to help support planning decisions.

Figure 6-1: Key flood risk documents and strategic planning links



6.2 Legislation

6.2.1 EU Floods Directive & the Flood Risk Regulations

The European Floods Directive (2007) sets out the EU's approach to managing flood risk. It aims to improve the management of the risk that floods pose to human health, the environment, cultural heritage and economic activity. The Directive was translated into English law by the Flood Risk Regulations (FRR) 2009 which require Lead Local Flood Authorities (LLFAs) and the Environment Agency to produce Flood Risk Management Plans (FRMPs).

The Directive puts in place a six-year cycle of producing Preliminary Flood Risk Assessments (PFRAs) with the aim of identifying significant Flood Risk Areas and preparing flood hazard and risk maps as well as Flood Risk Management Plans (FRMPs). The first six-year cycle was completed in December 2015 and the second six-year cycle is currently underway.

Figure 6-2: EU Floods Directive

PFRAs should cover the entire area for local flood risk (focusing on ordinary watercourses, surface water and groundwater flooding). Where significant Flood Risk Areas are identified, using a national approach which is locally reviewed, the LLFA is then required to undertake flood risk hazard mapping and to produce FRMPs as illustrated in Figure 6-2.

The FRMP would need to consider objectives for flood risk management, i.e. reducing the likelihood and consequences of flooding, and measures to achieve those objectives.

With Main River hazard mapping assessments already having been undertaken at national scale, and having already published a variety of river basin/catchment scale flood risk management plans (CFMPs for example), the Environment Agency focused their efforts on assisting LLFAs to meet their own obligations under the Regulations, producing guidance on the delivery of PRFAs and recommendations for significant Flood Risk Areas.

6.2.1.1 North Yorkshire County Council Preliminary Flood Risk Assessment

The NYCC PFRA (published in August 2011 as required under the FRR) stated that local sources of flooding (excluding main river) include surface water, ordinary watercourses, groundwater and canals. The NYCC PFRA covered all seven North Yorkshire LPAs, including Craven.

The PFRA found that within Craven there were no nationally significant harmful consequences that could be deduced from information on past flood events. In some areas across North Yorkshire there was found to be a high risk of flooding from local sources, with surface water being the main risk in the county. In the Craven district, approximately 370 dwellings are highlighted to be at risk of flooding from ordinary watercourses. Surface water risk was assessed based on the Environment Agency Flood Map for Surface Water (FMfSW). Approximately 2,800 dwellings in Craven are said to be at risk of surface water flooding from the 1 in 200 AEP rainfall event. These dwellings were not located in significant clusters, so the risk is not considered sufficient to mark the district as a Flood Risk Area at European level. A FRMP was therefore not required.

The PFRA process is cyclical with the next revision due by 2017. This should be based on the Environment Agency's latest national surface water flood map, Risk of Flooding from Surface Water (RoFSW).

6.2.2 Flood & Water Management Act

The Flood and Water Management Act (FWMA) was passed in April 2010. It aims to improve both flood risk management and the way we manage our water resources. It has created clearer roles and responsibilities and helped to define a more risk-based approach to dealing with flooding. The lead role is played by Lead Local Flood Authorities (LLFAs) who should manage local flood risk, from surface water, groundwater and ordinary watercourses, and co-ordinate an overall approach for dealing with all flood risk with the Environment Agency.

The content and implications of the FWMA offer considerable opportunities for improved and integrated land use planning and flood risk management by Local Authorities and other key partners. The integration and synergy of strategies and plans at national, regional and local scales, is increasingly important to protect vulnerable communities and deliver sustainable regeneration and growth. Section 6.5.3 discusses the role of the LLFA and Table 6-2 provides an overview of the key LLFA responsibilities under the FWMA.

6.2.3 Water Framework Directive & Water Environment Regulations

The purpose of the Water Framework Directive (WFD) is to deliver improvements across Europe in the management of water quality and water resources. The Water Environment Regulations (2003) transposed the WFD into law in England and Wales. The first management cycle of the WFD required all inland and coastal waters to reach "good waterbody status" by 2015 through a catchment-based system of River Basin Management Plans (RBMPs), incorporating a programme of measures to improve the status of all natural water bodies. There is an exception for "heavily modified water bodies", that are required to achieve "good waterbody potential". The deadline for achieving good waterbody status can be extended to 2021 or 2027 if required, for technical or economic reasons.

The Environment Agency is responsible for monitoring and reporting on the objectives of the Water Framework Directive (WFD) on behalf of government. They work with Government, Ofwat, local government, non-governmental organisations (NGOs) and a wide range of other stakeholders including local businesses, water companies, industry and farmers to manage water[14].

The second management cycle of the WFD[15] has already begun and the second river basin management plans were completed in 2015, building upon the first set of plans. The CDC area is covered by two River Basin Management Plans both of which were managed by the Environment Agency, the North West RBMP published in 2015 and the Humber RBMP in 2016.

The main responsibility for CDC and NYCC is to work with the Environment Agency to develop links between river basin management planning and the development of Local Authority plans, policies and assessments. In particular, the programmes of actions (measures) within the RBMPs highlight the need for:

- Water Cycle Studies to promote water efficiency in new development through regional strategies and local development frameworks
- Surface Water Management Plan implementation
- Considering the WFD objectives (achieving good status or potential as appropriate) in the spatial planning process, including LDDs and Sustainable Community Strategies
- Considering WFD measures that also contribute to controlling flood risk, e.g. natural flood management measures
- Promoting the wide scale use of Sustainable Drainage Systems (SuDS) in new development
- Capital investment to improve flood risk management, specifically in the North West.

6.3 Planning Policy

6.3.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012, and is based on core principles of sustainability. It forms the national policy framework in England and is accompanied by a number of Planning Practice Guidance notes. Together, these assist Local Planning Authorities in the preparation of Local Plans and in making informed decisions regarding management of development. The NPPF states (in Section 10, Paragraph 100) that Local Plans…

"...should be supported by a Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources, taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as Lead Local Flood Authorities and Internal

14 https://www.gov.uk/government/policies/improving-water-quality/supporting-pages/planning-for-better-water

15 http://ec.europa.eu/environment/water/water-framework/info/timetable_en.htm

Drainage Boards. Local Plans should apply a sequential, risk-based approach to the location of development to avoid, where possible, flood risk to people and property and manage any residual risk, taking account of the impacts of climate change, by applying the Sequential Test, if necessary applying the Exception Test, safeguarding land from development that is required for current and future flood management, using opportunities offered by new development to reduce the causes and impacts of flooding and where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long term, seeking opportunities to facilitate the relocation of development including housing to more sustainable locations".

> The Sequential Test must be performed when considering the placement of future development and for planning application proposals. The Sequential Test is used to direct all new development (through the site allocation process) to locations at the lowest probability of flooding. It states that development should not be permitted or allocated if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding.

The Flood Risk and Coastal Change Planning Practice Guidance (FRCC-PPG) sits alongside the NPPF and sets out detailed guidance on how this policy should be implemented.

6.3.2 Flood Risk and Coastal Change Planning Practice Guidance (FRCC-PPG)

On 6 March 2014 the Department for Communities and Local Government (DCLG) launched their planning practice guidance, which includes guidance for flood risk and coastal change. This new guidance is available as a web-based resource[16] which is accessible to all and regularly updated. It replaces the previous Technical Guidance. Whilst the NPPF concentrates on high level national policy, the FRCC-PPG is more detailed. The practice guidance offers advice on taking account of the risks associated with flooding and coastal change during planning, in the production of plans and in the development management process, to make development safe from flooding. This is in respect to local plans, SFRAs, the sequential and exception tests, permitted development, site-specific flood risk, neighbourhood planning, flood resilience and resistance techniques and the vulnerability of development.

6.3.3 Planning and Compulsory Purchase Act, 2004

The Planning and Compulsory Purchase Act (PCPA) sets out provisions with regards to regional functions, local development and development control whilst radically changing the raft of documents required in order for a Local Plan to be produced and adopted. Previous documents include regional planning guidance, county structure plans, district local plans, unitary development plans, and old-style 'structure' plans. These were replaced with Regional Spatial Strategies (RSS) and Local Development Frameworks contained within a series of Development Plan Documents (DPD).

6.3.4 Planning Act, 2008

This act predominantly applies to streamlining the approval of major national infrastructure development. However, this act also allowed for the streamlining of planning appeals for minor developments by allowing appeals to be heard and considered by a panel of local councillors rather than by a planning inspector. The Community Infrastructure Levy (CIL) was also formed from the Planning Act, 2008, whereby a local authority could place a levy on a new development to help finance local infrastructure projects designed to benefit the local area, such as a new school, health centre or park improvements.

6.3.5 Localism Act

The Localism Act was given Royal Assent in November 2011 with the purpose of shifting power from Central Government back to local councils, communities and individuals. The Government abolished Regional Spatial Strategies, providing the opportunity for councils to re-examine the local evidence base and establish their own local development requirements for employment, housing and other land uses through the plan making process.

16 http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/

Additionally, this act places a duty to cooperate on local authorities, including statutory bodies and other groups, in relation to the planning of sustainable development. Under this duty, local authorities are required to:

"...engage constructively, actively and on an ongoing basis in any process by means of which development plan documents are prepared so far as relating to a strategic matter." (Provision 110).

This act, together with the Neighbourhood Planning (General) Regulations 2012, also provides new rights to allow parish or town councils to deliver additional development through neighbourhood planning (Neighbourhood Plans). This means local people can help decide where new homes and businesses should go and what they should look like. Local planning authorities will be required to provide technical advice and support as neighbourhoods draw up their proposals. Neighbourhood Plans have a number of conditions and requirements, set out in legislation and the NPPF and Planning Practice Guidance.

6.3.6 Local Plans

A Local Plan[17] is a statutory document at the heart of the planning system, in which the LPA must clearly define its vision for the area. A key requirement of a Local Plan is that it is kept up to date, which means the plan evolves over the course of the applicable period. A Local Plan is designed to promote and deliver sustainable development by setting out a framework for future development of the local area, addressing needs and opportunities in relation to housing, the economy, community facilities and infrastructure, as well as safeguarding the environment, adapting to climate change and securing good design. Local Plans set the context for guiding local decisions and development proposals for the long-term use of land and buildings and the reconciliation of competing development and conservation interests. A Local Plan aims to ensure that land use changes proceed coherently, efficiently, and with maximum community benefit. Local Plans should indicate clearly how local residents, landowners, and other interested parties might be affected by land use change. They are subject to regular periods of intensive public consultation, public involvement, negotiation and approval.

The NPPF requires that the evidence base for the Local Plan must clearly set out what is intended over the lifetime of the plan, where and when this will occur and how it will be delivered. Local Plans should be informed by several evidence-based documents including a SFRA and a Sustainability Appraisal, and should take account of advice provided by the Environment Agency and other flood risk management bodies. The SFRA should be used to ensure that when allocating land or determining planning applications, development is located in areas at lowest risk of flooding. Policies to manage, mitigate and design appropriately for flood risk should be written into the plan.

6.3.6.1 The Craven District Council Local Plan

The new Craven District Council Local Plan is due for submission in 2017, with an Examination in Public (EiP) scheduled to follow (further details of the Local Plan development process can be found on the Craven District Council website[4]). The Craven Local Plan excludes any areas within the Yorkshire Dales National Park, for which the National Park Authority is the LPA. The new Local Plan will cover the period up to 2030. It will outline how land will be used for housing, business, recreation and conservation, how the location and timing of development will be decided and how sustainable development can be achieved. The Local Plan should be the starting point when considering planning applications.

6.3.6.2 Sustainability Appraisal

The Sustainability Appraisal (SA) is a key component of the Local Plan evidence base, ensuring that sustainability issues are addressed during the preparation of Local Plans. The SA is a technical document which has to meet the requirements of the Strategic Environmental Assessment Directive 2001/42/EC, which assesses and reports on a plan's potential impact on the environment, economy, and society. The SA provides an assessment of the draft policies at various stages throughout the preparation of the Local Plan by testing the potential impacts, and

17 Town and Country Planning, England. The Town and Country Planning (Local Planning) (England) Regulations 2012

considerations of alternatives are tested against the plan's objectives and policies. This ensures that the plan's potential impacts on the aim of achieving sustainable development are considered and that adequate mitigation and monitoring mechanisms are implemented.

In accordance with Regulation 16 (3) and (4) of the Environmental Assessment of Plans and Programmes Regulations 2004, Craven District Council produced a Sustainability Appraisal in December 2013 in support of the new Craven Local Plan. This draft SA was developed to gather evidence and identify SA objectives. The document also formed a SEA Scoping Report, including the SEA requirements under the approach to sustainability appraisal, due to the significant overlap that exists between the two processes. Plans, policies and programmes were reviewed in terms of the key elements of sustainability; social and economic effects as well as environmental objectives. Craven District Council developed a framework for undertaking iterative sustainability appraisal testing of the emerging plan and alternative strategies. The SA document will be revised alongside the development of the latest Local Plan.

6.4 Flood Risk Management Policy

6.4.1 Catchment Flood Management Plans

Developed by the Environment Agency, a Catchment Flood Management Plan (CFMP) is a key tool within spatial planning. It gives a broad overview of flood risk mainly from Main River and tidal sources and also develops complementary policies for long-term management of flood risk within the catchment. These take account of the likely impacts of climate change and effects of land use and land management, but aim to deliver multiple benefits and contribute to sustainable development, which is critical when areas under development pressure coincide with high flood risk.

Chosen policies and actions highlight areas where development should be avoided when it is deemed inappropriate to reduce current and future flood risk. They also indicate where water should be allowed to flood or where current flood risk measures should be reduced. Development should therefore be focused towards the more 'sustainable' areas in terms of those locations at lower risk of flooding or where flood risk management is considered viable within the short and long-term plans. Therefore, if development has been proposed in flood risk areas and the chosen policy is not to take further action to reduce flood risk, then developments will find it difficult to rely on Environment Agency led FRM infrastructure investment and there will be a great reliance on private (developer) funding to reduce risk. In this instance, development may not be viable.

As part of the CFMP process, each CFMP area was divided up into broad areas (known as 'policy units'), which represent areas of similar characteristics, flood mechanisms and flood risks. Each policy unit was then assessed to decide which policy will provide the most appropriate level and direction of flood risk management both now and in the future. Whilst the policy unit simplifies direct action over vast areas of land, in reality, the chosen policy may only focus on a small urban or rural area within that policy unit.

There are four relevant CFMPs within the Craven District Council boundary, each covering only part of the local planning area;

- the Lune[18] covers the River Greta and River Wenning in the north-west
- the Ribble[19] is located in the central area
- the Aire[20] covers the largest proportion of the district and is located in the south
- the Ouse[21] covers a small area in the far east of the district on the River Wharfe.

18 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/293698/Lune_Catchment_Flood_Management_Plan.pdf

19 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/293727/Ribble_Catchment_Flood_Management_Plan.pdf

20 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/289346/River_Aire_Catchment_Flood_Management _Plan.pdf

21 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/289228/River_Ouse_Catchment_Flood_Management_Plan.pdf

The district is covered by 11 policy units from the various CFMPs; five from the Aire, two from the Lune, one from the Ouse and three from the Ribble. These are summarised in Table 6-1. The policy options chosen for the units covering Craven will influence local plan policy.

Table 6-1: CFMP policy options within Craven district

Policy Option		Policy Unit	CFMP
Policy 1	No active intervention	Upper Ribble and Hodder	Ribble
Policy 4	Take further action to sustain the current level of flood risk into the future.	Rural Lune Settle	Lune Ribble
Policy 5	Take further action to reduce flood risk.	A2 - Skipton A4 - Upper Aire A5 - Keighley Wenning sub-catchment	Aire Aire Aire Lune
Policy 6	Take action with others to store water or manage runoff in locations that provide overall flood risk reduction or environmental benefits locally or elsewhere in the catchment.	A1 - Aire Headwaters A3 - Earby & Kelbrook W1 - Wharfe Headwaters Long Preston Deeps	Aire Aire Ouse Ribble

6.4.2 National and Local Flood Risk Management Strategies

The FWMA establishes how flood risk will be managed within the framework of National Strategies for England and Local Strategies for each LLFA area (Figure 6-1).

The National Strategy for England has been developed by the Environment Agency with the support and guidance of Defra. It sets out principles for how flood risk should be managed and provides strategic information about different types of flood risk and which organisations are responsible for their effective management. The Act requires risk management authorities (local authorities, internal drainage boards, sewerage companies and highways authorities) to work together and act consistently with the National Strategy in carrying out their flood and coastal erosion risk management functions effectively, efficiently and in collaboration with communities, business and infrastructure operators to deliver more effective flood risk management.

LLFAs have responsibility for developing a Local Flood Risk Management Strategy (LFRMS) for their area covering local sources of flooding (Table 6-2). The local strategy produced must be consistent with the National Strategy. It should set out the framework for local flood risk management functions and activities and should raise awareness of local organisations with responsibilities for flood risk management in the area. The strategy should also facilitate partnership arrangements to ensure co-ordination between local organisations and an assessment of flood risk and plans and actions for managing risk, as set out under section 9 of the FWMA.

North Yorkshire County Council, as the LLFA, produced a Consultation Draft version of a LFRMS in October 2014, in partnership with the seven district councils of North Yorkshire (Craven, Hambleton, Harrogate Ryedale, Richmondshire, Scarborough and Selby).

6.4.2.1 NYCC Local Flood Risk Management Strategy

The LFRMS sets out how NYCC, as LLFA, will manage flood risk from all types of flooding for which the County Council has a responsibility as LLFA (such as surface water runoff, groundwater and ordinary watercourses), and other types of flooding where local agents can play a supporting role to lead agencies. CDC as a LPA within NYCC are required to work in partnership with the LLFA to manage flood risk.

The LFRMS has six key objectives:

- To provide a greater role for communities in managing flood risk
- To improve the knowledge and understanding of flood risk and management responsibilities within NYCC and amongst partners, stakeholders, communities and the media
- To encourage sustainable and appropriate development utilising sustainable drainage wherever possible

- To increase knowledge of watercourse network and drainage infrastructure
- To carry out flood risk management measures that deliver social, economic and environmental benefits
- To make the best use of all potential funding opportunities to deliver flood risk management measures.

The Strategy also sets out an action plan of how the LLFA intend to achieve these objectives. Proposed actions are divided into four categories; Prevention, Protection, Preparedness and Recovery & Review. Each category contains the following information:

- A description of the action required
- The timescale for implementation of the action
- The source of flooding that relates to the action
- The level of priority
- The organisation to lead the action and support organisations
- The estimated cost of the action

6.4.3 Surface Water Management Plans

In June 2007, widespread extreme flooding was experienced in the UK. The Government review of this extreme flooding, chaired by Sir Michael Pitt, recommended that…

"…Local Surface Water Management Plans (SWMPs) … coordinated by local authorities, should provide the basis for managing all local flood risk."

The Government's guidance document[22] 2011 for SWMPs defines a SWMP as:

- *A framework through which key local partners with responsibility for surface water and drainage in their area, work together to understand the causes of surface water flooding and agree the most cost-effective way of managing surface water flood risk.*
- *A tool to facilitate sustainable surface water management decisions that are evidence based, risk based, future proofed and inclusive of stakeholder views and preferences.*
- *A plan for the management of urban water quality through the removal of surface water from combined systems and the promotion of SuDS.*

As a demonstration of its commitment to SWMPs as a structured way forward in managing local flood risk, Defra announced an initiative to provide funding for the highest flood risk authorities to produce SWMPs.

To date, no SWMPs have been published for the Craven district. The Environment Agency's River Aire CFMP[20] recommended that a SWMP should be developed for the Skipton Area.

6.4.4 Flood Risk Partnerships and Partnership Plans

CDC has been involved in the development of a number of partnerships designed to provide collaboration between public agencies, businesses and the community. Partnerships and plans that affect the district include:

- North Yorkshire Local Resilience Forum (NYLRF)
- North Yorkshire County Council Emergency Planning Unit
- Community Emergency Plans (at the town / parish council level)
- Community Risk Register
- 'Yorkshire Floods' (support & recovery group)
- Craven Community and Voluntary Service[23]

22 Surface Water Management Plan Technical Guidance - https://www.gov.uk/government/publications/surface-water-management-plan-technical-guidance

23 www.cravencvs.org.uk

6.4.5 Open Space Assessments

Open space, or Green Infrastructure (GI), should be designed and managed as a multifunctional resource capable of delivering a wide range of environmental and quality of life benefits for local communities. It should be provided as an integral part of all new development, alongside other infrastructure such as utilities and transport networks. Open space can provide many social, economic and environmental benefits close to where people live and work including:

- Places for outdoor relaxation and play;
- Space and habitat for wildlife with access to nature for people;
- Environmental education;
- Local food production - in allotments, gardens and through agriculture;
- Improved health and well-being – lowering stress levels, providing exercise opportunities;
- Climate change adaptation - for example flood alleviation and cooling urban heat islands.

The NPPF explains that open space can perform many functions, including flood risk mitigation, and that Local Plans should account for increased flood risk, resulting from climate change, through the planning of GI. GI can have an important role to play in reducing the likelihood of flooding by providing space for flood storage, reducing runoff and increasing infiltration, whilst also providing other benefits as stated above.

Sustainable Drainage Systems (SuDS) should be implemented alongside GI, specifically within potential development sites, where possible. The suitability of GI and SuDS can be informed by this SFRA through utilisation of open space for water in the areas of greatest flood risk.

The Town and Country Planning Association together with The Wildlife Trusts produced a guidance document for Green Infrastructure in 2012[24]. The guidance states that Local Plans should identify funding sources for GI and provision should be made for GI to be adequately funded as part of a development's core infrastructure. For new developments, GI assets can be secured from a landowner's 'land value uplift' and as part of development agreements. The LPA could include capital for the purchase, design, planning and maintenance of GI within its Community Infrastructure Levy (CIL) programme.

There should be an integrated approach to flood risk and open space throughout the district which would be key in delivering sustainable development. Examples include:

- Restoration of the natural character of floodplains;
- Keeping and preserving of areas of existing natural floodplain;
- Introduction of new areas and enhancing existing areas of greenspace whilst incorporating sustainable drainage within new development;
- Reduction of downstream flood risk.

6.5 Roles and Responsibilities

The responsibilities for the Risk Management Authorities (RMA) under the Flood and Water Management Act (FWMA) and the Flood Risk Regulations (FRR) are summarised below.

6.5.1 Environment Agency as a RMA

- Has a strategic overview role for all forms of flooding;
- Has the power to request information from any partner in connection with its risk management functions;
- Must exercise its flood or coastal erosion risk management functions in a manner consistent with the National Strategy and Local Strategies;
- Must be consulted on Local Strategies, if affected by the strategy, by the LLFA;
- Must help advise on sustainable development.

24 Planning for a Healthy Environment - Good Practice Guidance for Green Infrastructure and Biodiversity, Published by the Town and Country Planning Association and The Wildlife Trusts, July 2012

6.5.2 Craven District Council LPA as a RMA

- Has a duty to act in a manner that is consistent with the National Strategy and have regard to Local Strategies;
- Must be consulted on Local Strategies, if affected by the strategy, by the LLFA;
- Has a duty to be subject to scrutiny from the LLFA;
- Has a duty to cooperate and share information with other RMAs;

6.5.3 North Yorkshire County Council LLFA as a RMA

- Must develop, maintain, apply and monitor a strategy for local flood risk management. This must be consulted on with all RMAs, the public and all other partners with an interest in local flood risk, and must comply with the National Strategy;
- Is required to coordinate and share information on local flood risk management between relevant authorities and partners;
- Is empowered to request information from others when it is needed in relation to its flood risk management functions;
- Must investigate flooding incidents in its area where necessary or appropriate;
- Has a duty to establish and maintain a record of structures within its area that have a significant impact on local flood risk;
- Is empowered to designate structures and features that affect flooding;
- Has powers to undertake works to manage flood risk from surface runoff, groundwater and ordinary watercourses;
- Must exercise its flood and coastal erosion risk management functions in a manner consistent with the National Strategy and the Local Strategy;
- Is permitted to agree the transfer of responsibilities for risk management functions (except the production of a Local Strategy) to other RMAs;
- Must aim to contribute to sustainable development;
- Should consider flooding issues requiring collaboration with local LLFAs and other RMAs.

Table 6-2: Key LLFA Duties under the FWMA

FWMA Responsibility	Description of duties and powers	NYCC LLFA Status
Local strategy for Flood Risk Management	A LLFA has a duty to develop, maintain, apply and monitor a local strategy for flood risk management in its area. The local strategy will build on information such as national risk assessments and will use a consistent risk based approach across different Local Authority areas and catchments. The local strategy will not be secondary to the national strategy; rather it will have distinct objectives to manage local flood risks important to local communities.	Implemented 2014 (see Section 6.4.2.1)
Duty to contribute to sustainable development	The LLFA has a duty to contribute towards the achievement of sustainable development.	Ongoing
Duty to comply with national strategy	The LLFA has a duty to comply with national flood and coastal risk management strategy principles and objectives in respect of its flood risk management functions.	Ongoing
Investigating flood incidents	The LLFA, on becoming aware of a flood in its area, has (to the extent it considers necessary and appropriate) to investigate and record details of "locally significant" flood events. This duty includes identifying the relevant risk management authorities (RMAs) and their functions, and how they intend to exercise those functions in response to a flood. The responding RMA must publish the results of its investigation and notify other relevant RMAs.	Ongoing

FWMA Responsibility	Description of duties and powers	NYCC LLFA Status
Asset Register	A LLFA has a duty to maintain a register of structures or features, which are considered to have an effect on flood risk, including details on ownership and condition as a minimum. The register must be available for inspection and the Secretary of State will be able to make regulations about the content of the register and records.	Unknown
Duty to co-operate and powers to request information	The LLFA must co-operate with other relevant authorities in the exercise of their flood and coastal erosion management functions.	Ongoing
Ordinary Watercourse consents	A LLFA has a duty to deal with enquiries and determine watercourse consents where the altering, removing or replacing of certain flood risk management structures or features that affect flow on ordinary watercourses is required. It also has provisions or powers relating to the enforcement of unconsented works.	Ongoing
Works powers	The Act provides a LLFA with powers to undertake works to manage flood risk from surface runoff, groundwater and on ordinary watercourses, consistent with the local flood risk management strategy for the area.	Ongoing
Designation powers	The Act provides a LLFA with powers to designate structures and features that affect flooding or coastal erosion. The powers are intended to overcome the risk of a person damaging or removing a structure or feature that is on private land and which is relied on for flood or coastal erosion risk management. Once a feature is designated, the owner must seek consent to alter, remove, or replace it.	Ongoing
Emergency planning	A LLFA is required to play a lead role in emergency planning and recovery after a flood event.	North Yorkshire Local Resilience Forum (Section 9.2.2)
Community involvement	A LLFA should engage local communities in local flood risk management issues. This could include the training of community volunteers, the development of local flood action groups and the preparation of community flood plans, and general awareness raising around roles and responsibilities plans.	Various ongoing (Section 9.2.2)
Planning requirements for SuDS	Sustainable Drainage Systems (SuDS) are to become a planning requirement for major planning applications of 10 or more residential units or equivalent commercial development schemes with sustainable drainage. The LLFA is now a statutory planning consultee and it will be between the LPA and the LLFA to determine the acceptability of these proposed sustainable drainage schemes subject to exemptions and thresholds. Approval must be given before the developer can commence construction. Planning authorities should use planning conditions or obligations to make sure that arrangements are in place for ongoing maintenance of any SuDS over the lifetime of the development.	Implemented April 2015
Reservoirs	Designate high risk reservoirs, with preparation of a flood plan by the owner, including all relevant data.	Ongoing
Latest changes to FWMA legislation[25]		

25 http://www.legislation.gov.uk/ukpga/2010/29

6.5.4 Yorkshire Water and United Utilities as RMAs

- Have a duty to act in a manner consistent with the National Strategy and have regard to Local Strategies;
- Must be consulted on Local Strategies, if affected by the strategy, by the relevant LLFA;
- Have a duty to be subject to scrutiny from LLFAs;
- Have a duty to cooperate and share information with other RMAs;
- Are responsible for managing the risks of flooding from water and foul or combined sewer systems providing drainage from buildings and yards.

6.5.5 Airedale Drainage Commissioners as an RMA

The Airedale Drainage Commissioners look after specific watercourses and ditches on behalf of its members around the River Aire in the south of Craven[26]. Having the powers to regulate activities that may impede drainage, the ADC board can provide comments to relevant LPAs (including CDC) on developments in their district and when asked, make recommendations on measures required to manage flood risk and provide adequate drainage. In particular, they:

- Have responsibility for water level management in low lying areas;
- Can make byelaws to prevent flooding or remedy or mitigate damage caused by flooding;
- Must work in partnership with other authorities to actively manage and reduce flood risk.

6.5.6 Highways (NYCC) as a RMA

- Has a duty to act consistently with the National Strategy and Local Strategies;
- Has responsibility for ensuring effective drainage of local roads in so far as ensuring drains and gullies are maintained;
- Must be consulted on Local Strategies, if affected by the Strategy, by the LLFA;
- Has a duty to be subject to scrutiny from LLFAs.

6.5.7 The Local Community

- Must be consulted on Local Strategies by the LLFA;
- Has a key role in ensuring local strategies are capable of being successfully delivered within the community. They should actively participate in this and be engaged by the LLFA.

6.5.8 Riparian Owners

A riparian owner is someone who owns land or property alongside a river or other watercourses, including a culvert. A watercourse is any natural or artificial channel through which water flows, such as a river, including where rivers flow through a culvert, brook, beck, or mill stream. Riparian owners have statutory responsibilities, including:

- Maintaining river beds and banks;
- Allowing the flow of water to pass without obstruction;
- Controlling invasive alien species

Further guidance for riverside property owners is given in the Environment Agency's booklet 'Living on the Edge'[27].

6.5.9 Developers

- Have a vital role in ensuring effective local flood risk management by avoiding development in areas at risk of flooding. Local Strategies should form a key element of local planning guidance.

26 Craven District Council Climate Change Strategy And Climate Local Commitments 2013 – 2016 (www.cravendc.gov.uk/CHttpHandler.ashx?id=5654&p=0)

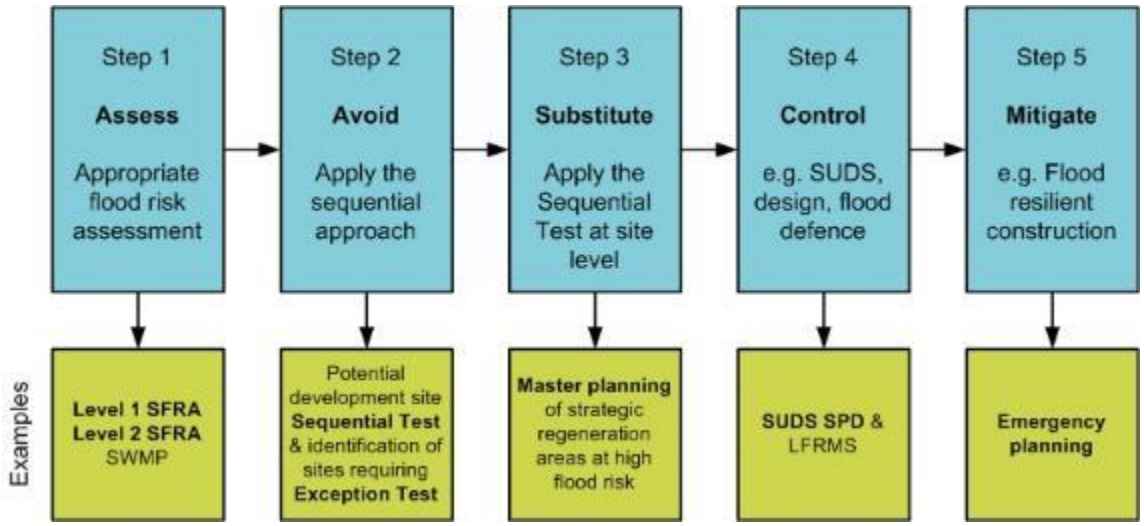
27 https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities

7 Accounting for flood risk in Local Plans

7.1 Introduction

In the context of allocating land in Local Plans, flood risk should be managed by the LPA using the five-stage hierarchy illustrated in Figure 7-1. A similar process is applied in relation to planning applications for development, which is discussed separately in Section 8. Actions to avoid, substitute, control and mitigate flood risk are central to this management framework. Examples of how these may translate into the council's management decisions and actions are also shown in Figure 7-1.

Figure 7-1: Flood Risk Management hierarchy



7.1.1 Step 1 - Assessing risk

As indicated by the hierarchy, it is important to assess the level of risk to an appropriate scale during the decision making process, (starting with this Level 1 SFRA[28]). Once this evidence has been provided, positive planning decisions can be made and effective flood risk management opportunities identified.

7.1.2 Steps 2 and 3 - Applying the sequential approach and Sequential Test to avoid or substitute flood risk

As outlined in Section 6.3.1, the sequential approach, which is integrated into all stages of the development planning process, is a requirement of the NPPF. The Flood Risk and Coastal Change Planning Practice Guidance (FRCC-PPG) further outlines the purpose and requirements of the Sequential Approach. Essentially having the sequential approach in place helps to ensure that development can be safely and sustainably delivered and developers do not waste their time promoting proposals which are inappropriate on flood risk grounds. Thereby it provides opportunities to reduce flood risk to people, their property and the environment to acceptable levels. The Sequential approach is facilitated by the Sequential Test, which is used to evaluate whether the flood risk is commensurate with the intended use/vulnerability of the site.

7.1.3 Steps 4 and 5 - Control and mitigation

If development in an area of flood risk cannot be avoided, then control or mitigation strategies come into play. At a strategic level these include the promotion of Sustainable Drainage Systems (SuDS) or the use of emergency planning strategies to mitigate the impact of the risk on those who might be affected. Control and mitigation measures are discussed separately in Section 9.

28 This SFRA does not remove the need for a site-specific Flood Risk Assessment at a development management stage.

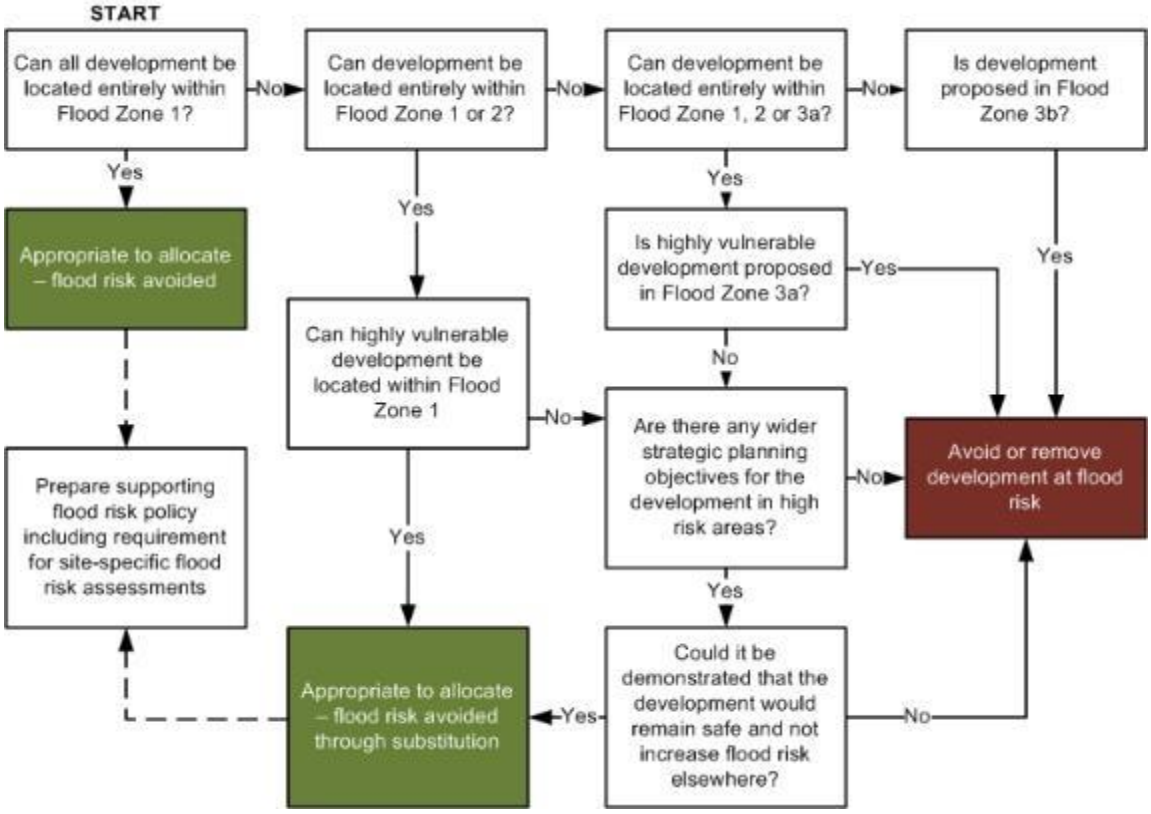
7.2 Applying the sequential approach

7.2.1 Processes

When developing the Local Plan Craven District Council, as the LPA, should seek to avoid allocating land for development in areas at risk of flooding through the adoption of the sequential approach. In this way development can be directed away from areas at highest risk, and measures can be taken to help ensure that development does not increase risk and, where possible, can help reduce the risk from flooding to existing communities.

The process diagram presented in Figure 7-2 illustrates how the sequential approach should be used to assess potential development sites against the Environment Agency's Flood Zones and how development should be compatible with the vulnerability of the proposed use for the development. The outcomes of this process will be either to avoid or remove a potential site, or to keep the potential site in the allocation if flood risk is avoided directly or through substitution.

Figure 7-2: Local Plan sequential approach to site allocation



This is a stepwise process, but a challenging one, as a number of the criteria used are qualitative and based on experienced judgement. The process must be documented and evidence used to support decisions recorded. In this respect, this Level 1 document provides the supporting evidence needed.

The main steps taken when applying the sequential approach will be as follows:

1. Applying the Sequential Test for each potential development site and if the Sequential Test is passed, applying the Exception Test, if required.
2. Safeguarding land from development that is required for current and future flood management.
3. Using opportunities offered by new development to reduce the causes and impacts of flooding, or to reduce flooding at existing development, where flood risk is expected to increase in future meaning the development may not be sustainable in the long term.
4. Seeking opportunities to facilitate the relocation of development, including housing, to more sustainable locations.

7.2.2 Vulnerability classes

The proposed use of a development has an influence on how flood risk implications are dealt with within the sequential approach. The Flood Risk and Coastal Change PPG classifies vulnerability as follows (refer to the guidance for a complete list):

- Essential infrastructure - essential transport, utilities (include electricity power stations, substations and water treatment works), wind turbines.
- Highly vulnerable - police/ambulance/fire/command stations, emergency dispersal points, basement dwellings, caravan and mobile parks (including gypsy traveller sites) and hazardous substance installations.
- More vulnerable - hospitals, residential institutions (e.g. prisons, hostels), dwellings, schools, landfill sites and camping sites.
- Less vulnerable - shops, offices, general industry sites, non-residential institutions, mineral workings, sewage treatment works.
- Water compatible - sand and gravel workings, docks, recreation areas, amenity open space etc. Water compatible uses are allowed in Flood Zone 3b, however they should be designed and constructed so as to remain operational and safe for users in times of flood, result in no net loss of floodplain storage and not impede water flows or increase flood risk elsewhere

Mixed use sites should be placed into the higher of the relevant classes of flood risk sensitivity.

7.3 Sequential Test

7.3.1 Objectives

The overall aim of applying the Sequential Test for Local Plan preparation is to steer new development into areas that have the lowest flood risk. Although the Sequential Test is primarily informed by the Flood Zones, other forms of flooding should also be taken into account when assessing vulnerability and applying the sequential approach.

The application of the Sequential Test for Local Plan preparation, must address the following sequence of questions:

- Can development be allocated in Flood Zone 1, and if so the Sequential Test is passed, as long as other sources of flooding are not problematic.
- If not all development can be allocated in Flood Zone 1, can the remaining development be allocated in Flood Zone 2. If so the allocation is accepted, however the Exception Test would need to be applied in any development is of the highly vulnerable category.
- If not all development can be allocated in Flood Zones 1 and 2, can development be allocated within the lowest risk sites in Flood Zone 3 (i.e. the area designated as Zone 3a). This would need an Exception Test to justify the development.
- If development would need to take place in remaining areas e.g. in the Functional Floodplain (Flood Zone 3b), the appropriateness of development would need to be strategically reviewed through the Sustainability Appraisal.

In other words, where there are no reasonably available sites in Flood Zone 1, the flood risk vulnerability of land uses and reasonably available sites in Flood Zone 2 can be considered, applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in higher risk Flood Zone 3, be considered. This should take into account the flood risk vulnerability of land uses and the likelihood of meeting the requirements of the Exception Test if required. If the Sequential Approach indicates that a large number of potential allocations need to be evaluated through an Exception Test this would be addressed in a Level 2 SFRA.

7.3.2 Sequential Test outcomes

The FRCC-PPG flood risk vulnerability classification states that only water-compatible uses and essential infrastructure should be permitted in Flood Zone 3b, though any essential infrastructure must pass the Exception Test and clearly demonstrate that it does not increase or exacerbate

flood risk. No other development in Flood Zone 3b is permitted (although if the boundary could be changed to avoid 3b however, then part of the site could still be included).

Gypsy and traveller sites fall within the highly vulnerable category and are not permitted in Flood Zones 3b or 3a. They are permitted in Flood Zone 2 only if an Exception Test is passed.

Uses that fall into the more vulnerable categories are permitted in Flood Zone 3a if an Exception Test is passed. This means that land allocated for housing and waste management sites for hazardous materials (which fall in to the more vulnerable category) are not permitted in Flood Zone 3b and only in Flood Zone 3a with an Exception Test and FRA. Such sites are permitted in Flood Zone 2 subject to the undertaking of FRA.

Sites for employment/retail, recreation/leisure and minerals/waste (all of which are less vulnerable uses) are not permitted in Flood Zone 3b, but are permitted in Flood Zone 3a or Flood Zone 2, subject to the undertaking of a FRA

The main outcomes that may arise from the application of the Sequential Test to land being considered for development allocation are therefore:

Development site can be allocated

Development sites can be allocated where the Sequential Test and the Exception Test (if required) are passed. In addition, a site is likely to be allocated without the need to assess flood risk where the proposed use is for open space. Assuming the site is not to include any development and is to be left open then the allocations is likely to be acceptable from a flood risk point of view. For such sites, opportunities for flood storage should be explored however.

Exception Test required

The Exception Test is primarily required where Essential Infrastructure is proposed for Flood Zones 3a and 3b, or where Residential and other uses in the More vulnerable category are proposed in Flood Zone 3a. To avoid having to apply the Exception Test, the LPA should attempt to avoid allocating land for development in the risk area altogether.

Site-Specific Flood Risk Assessment

All development proposals within Flood Zones 2 or 3 must be accompanied by a FRA. Also any sites that have 100% of their footprints within Flood Zone 1 that are 1 hectare or more in area must be subject to a FRA and consideration of sources of flooding other than fluvial.

Consideration of revisions to site layout and design

If the site boundary can be altered to avoid 3b, the site could remain in the allocation. In terms of surface water flood risk, if risk is considered significant or where the size of the site might potentially not allow for on-site storage or application of appropriate SuDS then such sites ought to be rejected.

Site layout and design is important at the site planning stage where flood risk exists. The site area would have to be large enough to enable any alteration of the developable area of the site to remove development from the functional floodplain, or to leave space for on-site storage of flood water within Flood Zone 3a. Careful layout and design at the site planning stage may apply to such sites where it is considered viable based on the level of risk. Surface water risk and opportunities for SuDS should also be assessed at this stage. Only if local circumstances indicate the potential for adjustment of the site boundary to remove the site footprint from Flood Zone 3b to a lower risk zone could the site fall into this category, otherwise the recommendation would be for the Exception Test to be applied immediately.

Withdrawal of the site from the allocation list

A potential development site which fails to pass the Sequential Test (and/or the Exception Test) would need to be withdrawn from the allocation list.

7.3.3 Reviewing flood risk to potential sites as part of the Sequential Test

The following criteria are used to inform the Sequential Test outcomes for potential allocation sites. These criteria are applied sequentially based on an understanding of the proportion of each site's footprint in Flood Zones 1, 2, 3a and 3b.

Table 7-1: Criteria used to inform on the outcomes of the Sequential Test.

Outcome	Reasons
Consider withdrawal of site	• 10% or greater of the site footprint is within Flood Zone 3b. • The scale of surface water risk on the site is considered large enough that possible mitigation of the risk on site is deemed unlikely to be achievable.
Exception Test (plus FRA)	• Greater than 10% of the footprint of any residential or essential infrastructure site is within Flood Zone 3a (water-compatible and less vulnerable uses of land do not require the Exception Test if in Flood Zone 3a). • Greater than 10% of the footprint of any mixed-use site that may entail residential use is within Flood Zone 3a. • Any highly vulnerable developments with all of their footprint in Flood Zone 2 and 1.
Consider site layout and design	Where the site fails the Sequential Test due to a very small proportion of its footprint: e.g. • Less than 10% of the footprint of the area of any site type is within Flood Zone 3b. • Less than 10% of the footprint of any residential site is within Flood Zone 3a. • Less than 10% of the footprint of any mixed use site that may entail residential use is within Flood Zone 3a. • Less than 10% of the footprint of any essential infrastructure site is within Flood Zone 3a.
Development could be allocated subject to FRA	• Any site within Flood Zone 2 that does not have any part of its footprint within Flood Zone 3a, with the exception of highly vulnerable developments (such as gypsy and traveller sites) which would be subject to, and have to pass, the Exception Test. • Employment, retail, recreation and leisure sites within Flood Zone 3a assuming the site use falls within the less vulnerable or water-compatible category of the flood risk vulnerability classification of the FRCC-PPG. No part of the site can be within Flood Zone 3b. • Any site 100% within Flood Zone 1 where surface water flood risk is considered to be significant enough so as to require investigation through a site-specific FRA. • Any site 100% within Flood Zone 1 that is greater than or equal to 1 hectare in area.
Should be allocated on flood risk grounds subject to consultation with the LLFA	• Any site 100% within Flood Zone 1 that is less than or equal to 1 hectare in area and has no surface water flood risk issues.

Surface water flood risk is informed by the proportion of the footprint of each allocation site that falls with the 1 in 30-year (3.3% AEP event), 1 in 100-year (1% AEP event) and 1 in 1000-year (0.1% AEP event) risk envelopes shown on the Risk of Flooding from Surface Water map. The risk levels applied are:

- High risk if more than 10% of site footprint is within the 1 in 30-year,

- Medium risk if more than 10% of site footprint is within the 1 in 100-year,
- Lower risk if more than 20% of footprint is within the 1 in 1000-year.

The percentage thresholds are not included within any policy, it is merely considered that where a site has 10% or greater of its area at risk from the 1 in 30-year and 1 in 100-year event outlines, or 20% or greater for the 1 in 1000-year event, then it could prove difficult to manage this surface water on-site. The percentage thresholds also do not consider local conditions. Therefore, a site-specific FRA should be carried out to investigate possible mitigation measures for flood storage or infiltration techniques through appropriate SuDS.

For sites at surface water flood risk the following should be considered:

- Possible withdrawal, redesign or relocation of the site, certainly for those sites at higher risk from the 1 in 30-year event and those with a large percentage area at risk. Such sites would be considered to be too small to be able to mitigate the level of surface water risk apparent at each site.
- A detailed site-specific FRA incorporating surface water flood risk management and investigation of possible mitigation measures for flood storage or infiltration techniques through appropriate SuDS.
- Whether it would be more appropriate for the site to be nominated as open greenspace, thereby incorporating social and environmental benefits.

The LPA should also consider whether the delineation of areas of critical drainage may be appropriate for areas particularly prone to surface water flooding. CDC would need to undertake detailed analysis and consultation with the LLFA, Yorkshire Water, United Utilities and the Environment Agency. It may then be beneficial to carry out a Surface Water Management Plan (SWMP) or drainage strategy for targeted locations with any such areas of critical drainage. Investigation into the capacity of existing sewer systems would be required in order to identify critical parts of the system. Drainage model outputs could be obtained to confirm the critical parts of the drainage network and subsequent recommendations could then be made for future development i.e. strategic SuDS sites, parts of the drainage system where any new connections should be avoided, and parts of the system that may have any additional capacity and recommended runoff rates.

7.3.4 Local factors to consider

Whilst the outcomes of the Sequential Test are based on flood risk designation, it is important to consider that each individual site will require further investigation, as local circumstances may dictate the outcome of the recommendation. Such local circumstances may include the following:

- If sites have planning permission but construction has not started, the SFRA will only be able to influence the design of the development e.g. finished floor levels. New, more extensive flood extents (from new models) cannot be used to reject development where planning permission has already been granted
- Some sites may be able to develop around the flood risk. Planners are best placed to make this judgement i.e. will the site still be deliverable if part of it needs to be retained to make space for flood water.
- Surrounding infrastructure may influence scope for layout redesign/removal of site footprints from risk.
- Current land use. A number of sites included in the assessment are brownfield thus the existing development could be taken into account as further development may not lead to increased flood risk. However, the Environment Agency may have their own views on this in regard to health warnings as new-build properties in risk areas could be built with flood protection in mind.
- Existing planning permissions may exist on some sites where the Environment Agency may have already passed comment and/or agreed to appropriate remedial works concerning flood risk. Previous flood risk investigations/FRAs may already have been carried out at some sites.

7.4 Exception Test, safeguarded land for flood storage and sustainability appraisal

7.4.1 Exception Test

If it is not possible within the context of the Local Plan for all development to be located in zones with a lower probability of flooding, it would be necessary to demonstrate that the requirements of the Exception Test can be achieved (Figure 7-3). In which case it would need to be shown that any developments in areas of higher flood risk would provide wider sustainability benefits to the community, and that these benefits would outweigh any flood risk implications.

The following figure (taken from the PPG) shows where an Exception Test would be required according to proposed use (if a development has different types of use, its vulnerability should be based on the highest vulnerability category).

Figure 7-3: Flood risk vulnerability and flood zone 'compatibility'

Paragraph: 067 Reference ID: 7-067-20140306

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

For the Exception Test to be passed, the NPPF Paragraph 102 states:

a. *It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk informed by a Strategic Flood Risk Assessment where one has been prepared; and*

b. *A site-specific Flood Risk Assessment (FRA) must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*

Both elements of the test will have to be passed for development to be allocated or permitted.

Although actually passing the Exception Test will require the completion of a site-specific FRA, CDC should be able to assess the likelihood of passing the test at the Local Plan level by using the information contained in this SFRA to answer the following questions:

- Can development within higher risk areas be avoided or substituted?
- Is flood risk associated with possible development sites considered too high; and will this mean that the criteria for Exception Testing are unachievable?
- Can risk be sustainably managed through appropriate development techniques (resilience and resistance) and incorporate Sustainable Drainage Systems without compromising the viability of the development?

- Can the site, and any residual risks to the site, be safely managed to ensure that its occupiers remain safe during times of flood if developed?

Where it is unlikely that the Exception Test can be passed due to few wider sustainability benefits, the risk of flooding being too great, or the viability of the site being compromised by the level of flood risk management work required, then consideration should be given to avoiding the site all together. Once the process has been completed the LPA should then be able to allocate appropriate development sites through the Local Plan as well as prepare flood risk policy including the requirement to prepare site-specific FRAs for all allocated sites that remain at risk of flooding.

7.4.2 Safeguarding Land for Flood Storage

Where possible, the Council may look to allocate land designed for flood storage functions. Such land can be explored through the site allocation process whereby an assessment is made, using this SFRA, of the flood risk at potential sites and what benefit could be gained by leaving the site undeveloped. In some instances, the storage of flood water can help to alleviate flooding elsewhere, such as downstream developments. Where there is a large area of a site at risk that is considered large enough to hinder development, it may be appropriate to safeguard this land for the storage of flood water.

Potential development sites that might be applicable for flood storage would include any current greenfield sites:

- That are considered to be large enough (>1 hectare) to store flood water to achieve effective mitigation.
- With large areas of their footprint at risk from 1 in 30-year or 1 in 100-year surface water flood events (based on the RoFSW Map).
- That is within the functional floodplain (Flood Zone 3b).
- With large areas of their footprint at risk from Flood Zone 3a.
- That are large enough and within a suitable distance to receive flood water from a nearby development site using appropriate SuDS techniques which may involve pumping, piping or swales / drains.

Brownfield sites could also be considered though this would entail site clearance of existing buildings and conversion to greenspace.

7.4.3 Sustainability Appraisal

The Sustainability Appraisal should help to ensure that flood risk is taken into account at all stages of the planning process with a view to directing development away from areas at flood risk, now and in the future, by following the sequential approach to site allocation. Using the Sequential Test outputs, the Council should be able to make decisions on the sustainability of specific sites, with regards to flood risk. By avoiding sites identified as being at significant risk or by considering how changes in site layout can avoid those parts of a site at flood risk, the Council would be demonstrating a sustainable approach to development.

In terms of surface water, the same approach should be followed whereby those sites at highest risk should be avoided or site layout should be tailored to ensure sustainable development. This should involve investigation into appropriate SuDS techniques. The formal designation of Critical Drainage Areas through Surface Water Management Plans or drainage strategies, should also provide sustainability benefits by ensuring that any site within a CDA that is >0.5 ha should be subject to a site-specific FRA and be subject to a larger reduction on existing runoff rates to ensure appropriate mitigation of surface water risk.

Once the Council has decided on a final list of sites following application of the Sequential Test and, where required, the Exception Test, a phased approach to development should be carried out to avoid any cumulative impacts that multiple developments may have on flood risk.

For example, for any site where it is required to develop in Flood Zone 3, detailed modelling would be required to ascertain where water displaced by development may flow and to calculate subsequent increases in downstream flood volumes. The modelling should investigate scenarios

based on compensatory storage techniques to ensure that downstream or nearby sites are not adversely affected by development on other sites.

Using a phased approach to development, based on modelling results of floodwater storage options, should ensure that any sites at risk of causing flooding to other sites are developed first in order to ensure flood storage measures are in place before other sites are developed, thus ensuring a sustainable approach to site development. Also, it may be possible that flood mitigation measures put in place at sites upstream could alleviate flooding at downstream or nearby sites.

8 Accounting for flood risk in planning applications

8.1 Introduction

Just as with accounting for flood risk within Local Plan allocations (section 7), a hierarchical approach needs to be applied within the development management process in order to assess, control and mitigate the potential risk of flooding associated with planning applications.

The NPPF (Paragraph 103) states that when determining planning applications, LPAs should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where it can be demonstrated that

i) within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location; and

ii) development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of sustainable drainage systems.

This means that all development planning applications must be informed by a site-specific flood risk assessment and be subject to the Sequential Test and, if required, the Exception Test.

Paragraph 011 of the NPPF re-affirms planning law, stating that applications for planning permission *"…must be determined in accordance with the development plan unless material considerations indicate otherwise".* Development proposals that are in line with Local Plan policies should be approved. However, those that conflict with Local Plan policies should be refused unless material considerations indicate otherwise.

8.2 Demonstrating the Sequential Test for Planning Applications

8.2.1 Process stages

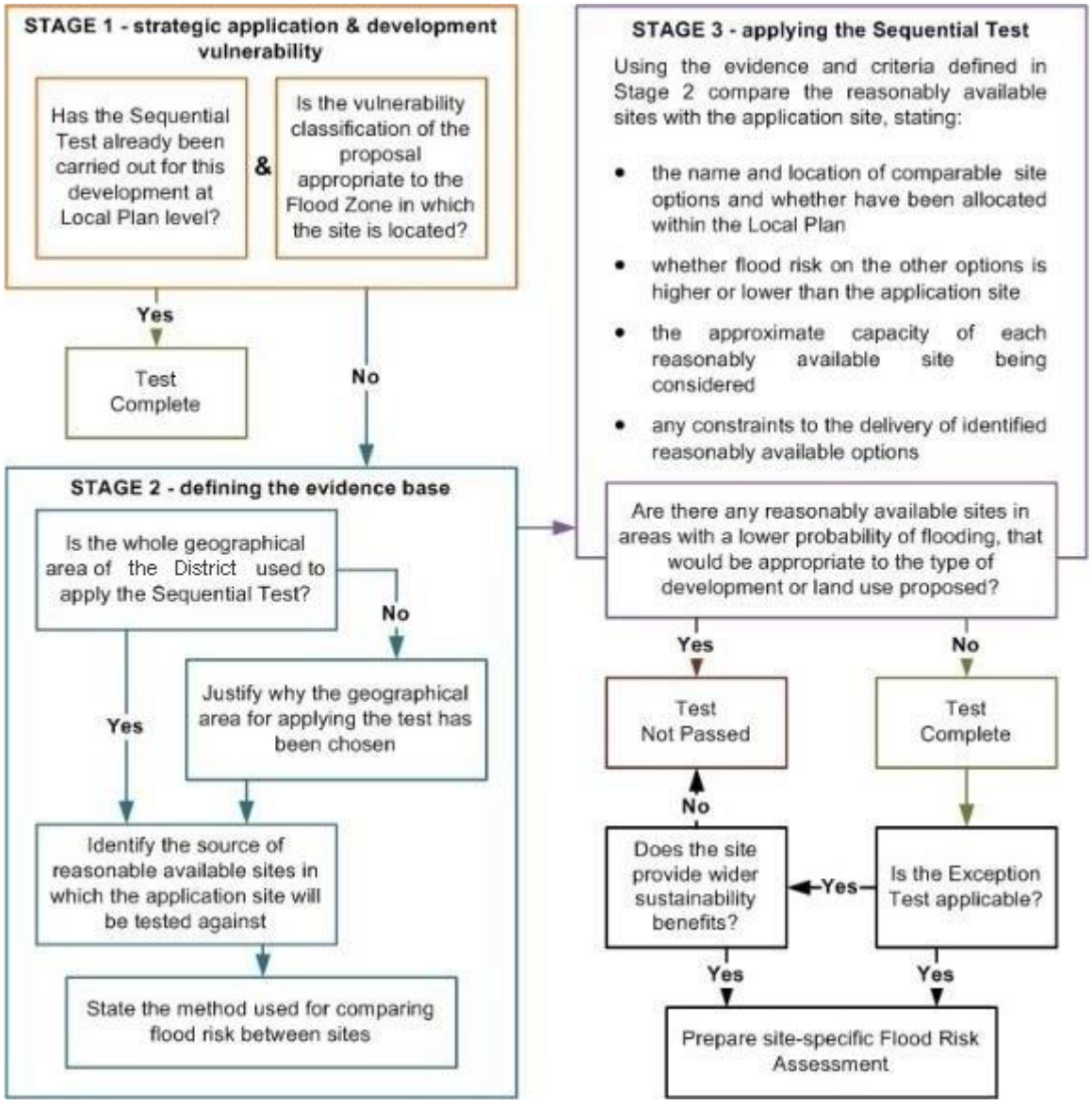
The Environment Agency's Standing Advice[29] recommends the following approach is used by LPAs to apply the Sequential Test to planning applications located in Flood Zones 2 or 3:

- *First, check the Local Plan for sites that have already been allocated for development and could be suitable for the development you're proposing,*
- *Also look at sites that haven't been allocated in the Local Plan, but that have been granted planning permission for a development that's the same or similar to the development you're proposing,*
- *Finally, check whether there are any 'windfall sites' in your search area. Windfall sites are sites that are not allocated in the Local Plan and don't have planning permission, but could be available for development. You can look for windfall sites yourself and also reference the Council's Housing Land Supply Report and the Housing and Employment Land Availability Assessment.*

Figure 8-1 illustrates the process of applying the Sequential Test within the context of development management (note this does not apply to change of use applications unless it is for change of land use to a caravan, camping or chalet site, or to a mobile home site or park home site). Close working between LPA Development and Planning departments will be required to implement this process. Any locally agreed approaches to the application of the Sequential Test (e.g. arising from consultations with the Environment Agency or the LFFA) should be taken into account.

29 https://www.gov.uk/guidance/flood-risk-assessment-the-sequential-test-for-applicants

Figure 8-1: Development management Sequential Test process



Stage 1 - Strategic review

Stage 1 considers strategic application and development vulnerability. In other words, the Sequential Test can be considered adequately demonstrated if *both* of the following criteria are met:

- The Sequential Test has already been carried out for the site (for the same development type) as part of the Local Plan
- The development vulnerability is appropriate to the Flood Zone.

If both these criteria are met, a reference should be provided for the site allocation of the Local Plan document and the vulnerability of the development should be clearly stated.

Stage 2 - Defining the evidence base

Stage 2 defines the evidence base. It aims to identify whether there are other potential sites which could suit the proposed development, and should consider the following:

- The geographic area in which the Sequential Test is to be applied. For Craven District Council, this would be defined by the local circumstances relating to the catchment and for the type of development being proposed.
- The source of reasonable available sites in which the application site will be tested against.
- The evidence and method used to compare flood risk between sites.

Stage 3 - Apply the Sequential Test

This stage involves comparing the proposed development site with the pool of sites identified in Stage 2. Sites should be compared in relation to flood risk; Local Plan status; capacity; and constraints to delivery including availability, policy restrictions, physical problems or limitations, potential impacts of the development, and future environmental conditions that would be experienced by the inhabitants of the development. The test should conclude if there are any reasonably available sites in areas with a lower probability of flooding, that would be appropriate to the type of development or land use proposed.

If the planning application passes the Sequential Test, then the applicant should apply the Exception Test in the circumstances set out by Tables 1 and 3 of the FRCC-PPG. In all circumstances, where the site is within areas at risk of flooding and where a site-specific FRA has not already been carried out, a site-specific FRA should be completed in line with the NPPF and the FRCC-PPG.

8.2.2 Other considerations

In addition to the formal Sequential Test, the NPPF sets out the requirement for developers to apply the sequential approach to locating development within the site. As part of their application and master planning discussions with applicants, LPAs should seek to determine whether or not:

- Flood risk can be avoided by substituting less vulnerable uses or by amending the site layout.
- Less vulnerable uses for the site have been considered.
- Density can be varied to reduce the number or the vulnerability of units located in higher risk parts of the site.

Careful layout and design at the site planning stage may apply to such sites where it is considered viable based on the level of risk. Surface water risk and opportunities for SuDS should also be assessed at this stage. Developers should refer to NYCC's SuDS Design Guide[30] section 1 which provides details of when and where SuDS are required. Further guidance on this is also given in Section 9.1. Any site layout and design options should take account of the eight metre easement buffer along watercourses, from the top of the bank or the landward toe of a defence on main rivers, where development is not permitted. This easement buffer is recommended by the Environment Agency to allow ease of access to watercourses for maintenance works.

Depending on local circumstances, if it is not possible to adjust the site boundary to avoid areas of higher flood risk, then development should not be permitted. It is also preferable to adjust the developable area of a site to remove any proposed development in Flood Zone 3a to a lower risk zone or to incorporate the on-site storage of water within site design. If this can't be achieved, then the Exception Test would have to be passed as part of a site-specific Flood Risk Assessment.

30 http://m.northyorks.gov.uk/CHttpHandler.ashx?id=30769&p=0

8.2.3 Site-specific Flood Risk Assessment

Purpose

A site-specific Flood Risk Assessment is carried out by (or on behalf of) a developer to assess the flood risk to and from a development site, and its outcomes should normally be provided when a planning application is submitted to the relevant LPA. The FRCC-PPG requires that the assessment should demonstrate to the decision-maker how flood risk will be managed over the entire lifetime of the development with regard to the vulnerability of its users. The assessment should also take climate change into account.

Applicability

According to NPPF footnote 20, a site-specific FRA should be prepared when the application site is:

- Situated in Flood Zone 2 and 3; for all proposals for new development (including minor development and change of use).
- 1 hectare or greater in size and located in Flood Zone 1.
- Located in Flood Zone 1 where there are critical drainage problems.
- At risk of flooding from other sources of flooding, such as those identified in this SFRA.
- Subject to a change of use to a higher vulnerability classification which may be subject to other sources of flooding.

The LPA may also like to consider further situations in which a FRA is deemed as statutory, such as for example:

- Where the proposed development site is situated in an area currently benefitting from defences.
- Where the proposed development site is situated within 20 metres of the bank top of a Main River.
- Where the proposed development site is situated over a culverted watercourse or where development will require controlling the flow of any river or stream or the development could potentially change structures known to influence flood flow.

These requirements should be considered during the preparation and development of the Local Plan.

Objectives

The objectives of a site-specific FRA are to establish whether a proposed development is likely to be affected by current or future flooding (including effects of climate change) from any source. This should include referencing this SFRA to establish sources of flooding. Further analysis should be performed to improve understanding of flood risk including agreement with the council on areas of functional floodplain that have not been specified within this SFRA. The FRA should provide evidence for the LPA to apply the Sequential Test (if necessary), and should determine:

- Whether the development will increase flood risk elsewhere.
- Whether the measures proposed to deal with these effects and risks are appropriate.
- Whether the development will be safe and pass the Exception Test, if applicable.

In particular, the FRA should determine the potential of increased flood risk elsewhere as a result of the addition of hard surfaces on-site and the effect of new development on surface water runoff, and consider "*opportunities to reduce the overall level of flood risk in the area and beyond. This can be achieved, for instance, through the layout and form of development, including green infrastructure and the appropriate application of sustainable drainage systems, through safeguarding land for flood risk management, or where appropriate, through designing off-site works required to protect and support development in ways that benefit the area more generally."*

The FRCC-PPG doesn't contain any further detail on the minimum requirements for site-specific FRAs. It is therefore important that the Environment Agency's FRA guidance[31] is referred to and the site-specific Flood Risk Assessment Checklist in paragraph 068 of the FRCC-PPG should also be consulted. CIRIA's report 'C624 Development and Flood Risk' also provides useful guidance.

In particular, the following might be considered for inclusion within the FRA.

- Detailed surface water modelling, especially for the larger sites which may influence sites elsewhere.
- An evaluation of the possibility of increased surface water flood risk caused by development on current Greenfield land, and cumulative impacts of this within specific areas. This may be especially relevant if the development site is large.
- Strategies for management and re-use of surface water on-site, assuming the site is large enough to facilitate this and achieve effective mitigation.
- The possibility of leaving surface water flood prone areas as open greenspace, incorporating social and environmental benefits.
- Demonstration of effective surface water management to ensure risks on and off site are controlled.
- Demonstration of appropriate use of SuDS to control runoff to Greenfield rates. Developers should refer to the NYCC SuDS Design Guidance[32]. Restrictions on surface water runoff from new development should be incorporated into the development planning stage. For brownfield sites, where current infrastructure may be staying in place, then runoff should attempt to mimic that of Greenfield rates, unless it can be demonstrated that this is unachievable or hydraulically impractical;

8.3 Specific Guidance for Developers

The following specific guidance is offered to developers on using this SFRA.

When initially considering the development options for a site, developers should use this SFRA, the NPPF and the Planning Practice Guidance to:

a. Assess whether the site is a windfall development, allocated development, within a regeneration area, single property or subject to a change of use to identify if the Sequential and Exception Tests are required.
b. Check whether the Sequential Test and/or the Exception Test have already been applied. This includes requesting information from the LPA on whether the Sequential Test, or the likelihood of the site passing the Exception Test, have been assessed. If the site was not considered in the Local Plan, it is necessary to provide evidence to the LPA that the site passes the Sequential Test and will pass the Exception Test.
c. Consult with the LPA Development Control, the LLFA, the Environment Agency and the wider group of flood risk consultees, where appropriate, to scope an appropriate FRA if required (taking into account guidance on FRAs provided earlier in this SFRA, plus referring to the Environment Agency Standing Advice, CIRIA Report C624, NYCC SuDS Design Guidance, the NPPF and the Planning Practice Guidance).
d. Submit FRA to Development Control and the Environment Agency for approval, where necessary.

Table 8-1 identifies, for developers, when the Sequential and Exception Tests are required for certain types of development, who is responsible for providing the evidence and those who should apply the tests if required.

31 https://www.gov.uk/flood-risk-assessment-local-planning-authorities
32 http://m.northyorks.gov.uk/CHttpHandler.ashx?id=30769&p=0

Table 8-1: Development types and application of Sequential and Exception Tests for developers

Development	Sequential Test Required?	Who Applies the Sequential Test?	Exception Test Required?	Who Applies the Exception Test?
Allocated Sites	No (Provided the use is the same as that in the site allocation)	LPA should have already carried out the test during the allocation of development sites	Dependent on land use vulnerability	LPA to advise on the likelihood of test being passed. The developer must also provide evidence that the test can be passed by providing planning justification and producing a detailed FRA
Windfall Sites	Yes	Developer provides evidence, to the LPA that the test can be passed. A search area will be defined by local circumstances relating to the catchment and for the type of development being proposed	Dependent on land use vulnerability	Developer must provide evidence that the test can be passed by providing planning justification and producing a detailed FRA
Regeneration Sites Identified Within Local Plan	No	-	Dependent on land use vulnerability	LPA to advise on the likelihood of test being passed. The developer must also provide evidence that the test can be passed by providing planning justification and producing a detailed FRA
Redevelopment of Existing Single Properties	No	-	Dependent on land use vulnerability	Developer must provide evidence that the test can be passed by providing planning justification and producing a detailed FRA
Changes of Use	No (except for any proposal involving changes of use to land involving a caravan, camping or chalet site)	Developer provides evidence, to the LPA that the test can be passed	Dependent on land use vulnerability	Developer must provide evidence that the test can be passed by providing planning justification and producing a detailed FRA

A more detailed assessment of the impacts of climate change on flooding from the land and rivers should be carried out as part of a FRA. This should be carried out using the sensitivity ranges and climate change allowances, published by the Environment Agency in February 2016[33].

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

9 Control and Mitigation

9.1 Sustainable Drainage Systems (SuDS)

Development has the potential to cause an increase in impermeable area, an associated increase in surface water runoff rates and volumes, and consequently a potential increase in downstream flood risk due to overloading of sewers, watercourses, culverts and other drainage infrastructure. Managing surface water discharges from new development is therefore crucial in managing and reducing flood risk to new and existing development downstream. Carefully planned development can also facilitate reductions in the number of properties directly at risk from surface water flooding.

As previously noted, NYCC as the LLFA has produced a SuDS Design Guidance document for developers (see Section 9.1.1) which should be referred to alongside this SFRA. CDC have not issued any local guidance or documentation with respect to the implementation of SuDS. Some guidance on planning development in a site is given in the Craven District Council Flood Risk Guide For Planning Applications[34] (published April 2011).

The FWMA, 2010, originally transferred the adoption and maintenance of SuDS to Sustainable Drainage Systems Approval Bodies (SABs) that were supposed to be established by local authorities, or LLFA's, under Schedule 3 of the Act. However, the designation of a SAB has since been removed following lengthy consultation, with the announcement from the Department for Communities and Local Government (DCLG) in December 2014 that local planners will be responsible for delivering SuDS[35]. Changes to planning legislation give provisions for major applications of ten or more residential units or equivalent commercial development to require sustainable drainage within the development proposals in accordance with the non-statutory technical standards for sustainable drainage systems[36], published in March 2015. This builds on the existing planning system, the NPPF, which developers and local authorities are already using. Policy changes to the planning system can also be introduced relatively quickly ensuring that flood risk benefits from sustainable drainage systems can be brought forward as part of planning application proposals.

The NPPF continues to reinforce how planning applications that fail to deliver SuDS above conventional drainage techniques could be rejected, and sustainable drainage should form part of integrated design secured by detailed planning conditions so that the SuDS to be constructed must be maintained to a minimum level of effectiveness.

Maintenance options must clearly identify who will be responsible for SuDS maintenance and funding for maintenance should be fair for householders and premises occupiers; and, set out a minimum standard to which the sustainable drainage systems must be maintained.

The runoff destination should always be the first consideration when setting out design criteria for SuDS including the following possible destinations in order of preference:

1. To ground;
2. To surface water body;
3. To surface water sewer;
4. To combined sewer.

Effects on water quality should also be investigated when considering runoff destination in terms of the potential hazards arising from development and sensitivity of the runoff destination. Developers should establish that proposed outfalls are hydraulically capable of accepting the runoff from SuDS through consultation with the LLFA, IDB, Yorkshire Water and United Utilities. If surface water is intended to be discharged to main river the Environment Agency should be consulted.

34 http://www.cravendc.gov.uk/CHttpHandler.ashx?id=1640&p=0

35 http://www.parliament.uk/business/publications/written-questions-answers-statements/written-statement/Commons/2014-12-18/HCWS161/

36 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/415773/sustainable-drainage-technical-standards.pdf

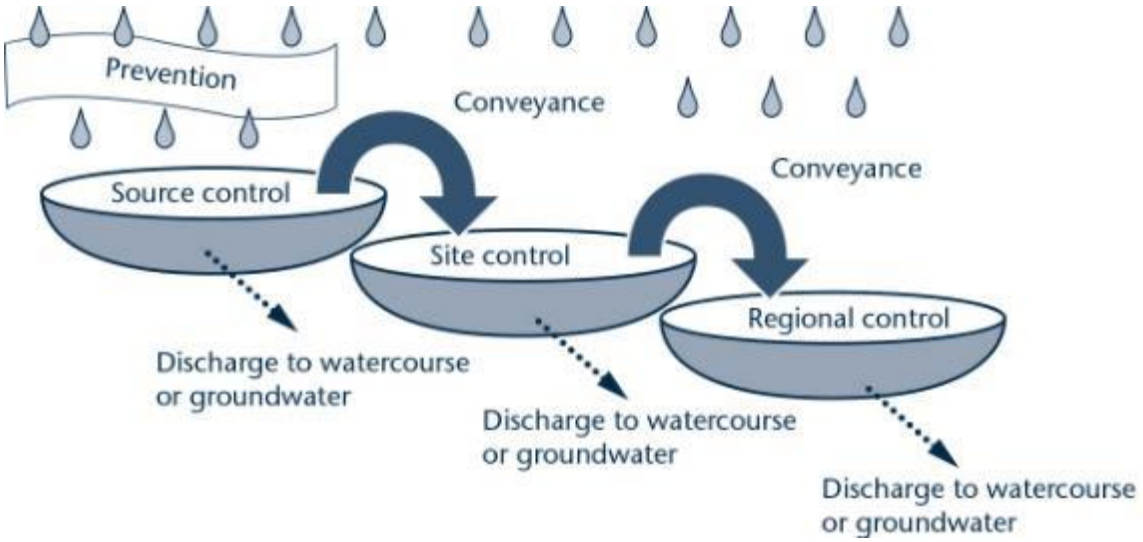
The non-statutory technical standards for sustainable drainage systems (March 2015) set out appropriate design criteria based on the following:

1. Flood risk outside the development;
2. Peak flow control;
3. Volume control;
4. Flood risk within the development;
5. Structural integrity;
6. Designing for maintenance considerations;
7. Construction.

In addition, the Local Planning Authority may set local requirements for planning permission that include more rigorous obligations than these non-statutory technical standards. More stringent requirements should be considered where current Greenfield sites lie upstream of high risk areas. This could include improvements on Greenfield runoff rates. CIRIA has also produced a number of guidance documents relating to SuDS that should be consulted by the LPA and developers.

Many different SuDS techniques can be implemented. As a result, there is no one standard correct drainage solution for a site. In most cases, a combination of techniques, using the Management Train principle (see Figure 9-1), will be required, where source control is the primary aim.

Figure 9-1: SuDS Management Train Principle[37]



The effectiveness of a flow management scheme within a single site is heavily limited by land use and site characteristics including (but not limited to) topography; geology and soil (permeability); and available area. Potential ground contamination associated with urban and former industrial sites should be investigated with concern being placed on the depth of the local water table and potential contamination risks that will affect water quality. The design, construction and ongoing maintenance regime of any SuDS scheme must be carefully defined as part of a site-specific FRA. A clear and comprehensive understanding of the catchment hydrological processes (i.e. nature and capacity of the existing drainage system) is essential for successful SuDS implementation.

9.1.1 NYCC SuDS Design Guidance

This guidance note details the requirements for SuDS design of NYCC in its capacity as the LLFA and applies to all planning applications to Craven District as LPA within NYCC. It points to the relevant design guidance for successful implementation of SuDS and is the basis for assessments of planning consultations from LPAs. The full report can be found here:

http://m.northyorks.gov.uk/CHttpHandler.ashx?id=30769&p=0

37 CIRIA (2008) Sustainable Drainage Systems: promoting good practice – a CIRIA initiative

9.2 Emergency Planning

The provisions for emergency planning for local authorities as Category 1 responders are set out by the Civil Contingencies Act, 2004 and the National Flood Emergency Framework for England, December 2014[38]. This framework is a resource for all involved in emergency planning and response to flooding from the sea, rivers, surface water, groundwater and reservoirs. The Framework sets out the Government's strategic approach to:

- Ensuring all delivery bodies understand their respective roles and responsibilities when planning for and responding to flood related emergencies.
- Give all players in an emergency flooding situation a common point of reference which includes key information, guidance and key policies.
- Establish clear thresholds for emergency response arrangements.
- Place proper emphasis on the multi-agency approach to managing flooding events.
- Provide clarity on the means of improving resilience and minimising the impact of flooding events.
- Provide a basis for individual responders to develop and review their own plans.
- Being a long-term asset that will provide the basis for continuous improvement in flood emergency management.

Along with the Environment Agency flood warning systems, there are a range of flood plans at a sub-regional and local level, outlining the major risk of flooding and the strategic and tactical response framework for key responders.

This SFRA contains useful data to allow emergency planning processes to be tailored to the needs of the area and be specific to the flood risks faced. The SFRA Maps in Appendix B and accompanying GIS layers should be made available for consultation by emergency planners during an event and throughout the planning process.

9.2.1 Civil Contingencies Act

Under the Civil Contingencies Act (CCA, 2004)[39], CDC is classified as a Category 1 responder and has duties to assess the risk of emergencies occurring, and uses this to:

- inform contingency planning;
- put in place emergency plans;
- put in place business continuity management arrangements;
- put in place arrangements to make information available to the public about civil protection matters;
- maintain arrangements to warn, inform and advise the public in the event of an emergency;
- share information with other local responders to enhance coordination;
- cooperate with other local responders to enhance coordination and efficiency and to provide advice and assistance to businesses and voluntary organisations about business continuity management.

During an emergency such as a flood event, the local authority must also co-operate with other Category 1 responders (such as the emergency services and the Environment Agency) to provide the core response.

9.2.2 North Yorkshire Local Resilience Forum (NYLRF)

CDC is a partner of the North Yorkshire Local Resilience Forum (NYLRF)[40]. The role of the Resilience Forum is to ensure an appropriate level of preparedness to enable an effective multi-agency response to emergency incidents that may have a significant impact on the communities of Craven District Council and other districts within North Yorkshire County. NYLRF consists of

38 https://www.gov.uk/government/publications/the-national-flood-emergency-framework-for-england

39 https://www.gov.uk/preparation-and-planning-for-emergencies-responsibilities-of-responder-agencies-and-others#the-civil-contingencies-act

40 http://www.emergencynorthyorks.gov.uk/

representatives from the emergency services, all eight of North Yorkshire's local authorities (CDC, Harrogate Borough Council, City of York Council, Hambleton District Council, Ryedale District Council, Scarborough Borough Council, Selby District Council, Richmondshire District Council), the North Yorkshire and York PCT, the Yorkshire and the Humber SHA (part of the NHS Trust), the Environment Agency, Public Health England and the Maritime and Coastguard Agency.

9.2.2.1 Community Risk Register

As a strategic decision-making organisation, the NYLRF prepared a Community Risk Register (CRR)[41], last updated in 2013, which considers the likelihood and consequences of the most significant risks and hazards the area faces, including fluvial and urban flooding. This SFRA can help to inform this. The CRR is considered as the first step in the emergency planning process and is designed to reassure the local community that measures and plans are in place to respond to the potential hazards listed within the CRR.

9.2.2.2 Community Emergency Plan

Communities may need to rely on their own resources to minimize the impact of an emergency, including a flood, before the emergency services arrive. Many communities already help each other in times of need, but experience shows that those who are prepared cope better during an emergency. Communities with local knowledge, enthusiasm and information are a great asset and a Community Emergency Plan can help.

NYLRF has produced a template on how to produce a Community Emergency Plan. To check whether a community already has an emergency plan in place, a map of the county is available via the following link:

http://maps.northyorks.gov.uk/connect/analyst/?mapcfg=comm_emergency_plans

For more information, communities should contact their town or parish council.

9.2.2.3 Household Plans

The NYLRF recommends individual families should create a Household Plan and Grab Bag to prepare for emergencies. A template for creating a Household Plan is available via:

http://emergencynorthyorks.gov.uk/CHttpHandler.ashx?id=32986&p=0

Craven District Council also provide advice to householders about preparing for flood events. Further details can be found on the CDC website via:

http://www.cravendc.gov.uk/article/1799/Flooding-Advice

9.2.3 District and local level flood planning

This SFRA provides a number of flood risk data sources that should be used when producing or updating flood plans. CDC will be unable to write specific flood plans for new developments at flood risk, developers should write their own. Guidance can be found on the Environment Agency web site[42]. Generally, owners with individual properties at risk should write their own individual flood plans, however larger developments or regeneration areas, such as retail parks, hotels and leisure complexes, should consider writing one collective plan for the assets within an area.

This SFRA can help to:

- Update these flood plans if appropriate;
- Inform emergency planners in understanding the possibility, likelihood and spatial distribution of all sources of flooding (emergency planners may however have access to more detailed information, such as for Reservoir Inundation Maps, which have not been made available for this SFRA);
- Identify safe evacuation routes and access routes for emergency services (in doing this an allowance for climate change should be made);

41 http://www.emergencynorthyorks.gov.uk/index.aspx?articleid=11778

42 https://www.gov.uk/prepare-for-a-flood/make-a-flood-plan

- Identify key strategic locations to be protected in flooding emergencies, and the locations of refuge areas which are capable of remaining operational during flood events;
- Provide information on risks in relation to key infrastructure, and any risk management activities, plans or business continuity arrangements;
- Raise awareness and engage local communities;
- Support emergency responders in planning for and delivering a proportionate, scalable and flexible response to the level of risk;
- Provide flood risk evidence for further studies.

9.2.3.1 Craven Multi Agency Flood Plan

The Craven Multi Agency Flood Plan was produced in conjunction with professional partners and co-ordinated by the Environment Agency. It sets out what each authority/organisation in Craven will do during a flood event. This plan identifies areas at risk of flooding and outlines the policies and procedures which enable the emergency services and supporting agencies to manage river and surface/ground water flooding within the Craven district[43].

9.2.3.2 CDC Environment Health team

Craven District Council's Environment Health team respond to emergencies including flooding, working alongside NYCC. Forty flooding hotspots throughout Craven are inspected by Environmental Protection staff every month. Debris is removed and any problem watercourses are added to the inspection list which has been successful in reducing future localised flooding[43].

9.3 Flood Warning and Evacuation Plans

The Environment Agency has emergency plans in place to deal with flooding. Around Craven they have set up river monitoring and early warning systems based on triggers from river level recorders. For example, in Skipton town centre there are level recorders in three areas at risk. The Environment Agency has a Flood Warning Plan whereby they notify professional partners and local residents about potential flooding. Flood warnings are issued via out-of-hours numbers to CDC Environmental Health, through the media to the general public and also directly by phone to residents in flood risk areas who have signed up to the early warning system[43].

Developments that include areas that are designed to flood (e.g. ground floor car parking and amenity areas) or have a residual risk associated with them, will need to provide appropriate flood warning and instructions so users and residents are safe in a flood. This will include both physical warning signs and written flood warning and evacuation plans. Those using the new development should be made aware of any evacuation plans.

There is no statutory requirement on the Environment Agency or the emergency services to approve evacuation plans. CDC is however accountable under its Civil Contingencies duties, via planning condition or agreement, to ensure that plans are suitable. This should be done in conjunction with planning and development officers. It is recommended that further discussions are held within CDC between emergency planners, policy planners/development and planning officers, the LLFA, drainage engineers and also external stakeholders such as the emergency services, the Environment Agency, Yorkshire Water, United Utilities, Internal Drainage Boards and the Canal & River Trust.

It may be useful for both the LLFA and spatial planners to consider whether, as a condition of planning approval, flood evacuation plans should be provided by the developer which aim to safely evacuate people out of flood risk areas, using as few emergency service resources as possible. Application of such a condition is likely to require policy support in the Local Plan, and discussions within the NYLRF are essential to establish the feasibility/effectiveness of such an approach, prior to it being progressed. It may also be useful to consider how key parts of agreed flood evacuation plans could be incorporated within local development documents, in terms of protecting evacuation routes and assembly areas from inappropriate development. Once the development goes ahead,

43 Craven District Council Climate Change Strategy And Climate Local Commitments 2013 – 2016 (www.cravendc.gov.uk/CHttpHandler.ashx?id=5654&p=0)

it will be the requirement of the plan owner (developer) to make sure the plan is put in place, and to liaise with CDC regarding maintenance and updating of the plan.

9.3.1 What should an evacuation plan include?

Flood warning and evacuation plans should include the information discussed in Table 9-1. The Environment Agency website provides access to advice and guidance on plans and templates available for businesses and local communities.

Table 9-1: Flood warning and evacuation plans

Consideration	Purpose
Availability of existing flood warning system	The Environment Agency offers a flood warning service that currently covers designated Flood Warning Areas in England and Wales. A full Flood Warning Service is provided in these areas.
Rate of onset of flooding	This describes how quickly the water arrives and the speed at which it rises. This will govern the opportunity for people to effectively prepare for and respond to a flood. This is an important factor within Emergency Planning in assessing the response time available to the emergency services.
How flood warning is given and occupants awareness of the likely frequency and duration of flood events	Everyone eligible to receive flood warnings should be signed up to the Environment Agency flood warning service. Where applicable, the display of flood warning signs should be considered, in particular at sites where members of the public visit on a daily basis, such as sports complexes, car parks, retail stores. It is envisaged that the responsibility should fall upon the developers and should be a condition of planning permission. Information should be provided to new occupants of houses concerning the level of risk and subsequent procedures if a flood occurs.
The availability of staff / occupants / users to respond to a flood warning and the time taken to respond to a flood warning	The plan should identify roles and responsibilities of all responders. The use of community flood wardens should also be considered.
Designing and locating safe access routes, preparing evacuation routes and identification of safe locations for evacuees	Dry routes will be critical for people to evacuate as well as emergency services entering the site. The extent, depth and flood hazard rating should be considered when identifying these routes.
Vulnerability of occupants	Vulnerability classifications associated with development as outlined in the FRCC-PPG. This is closely linked to its occupiers.
How easily damaged items will be relocated and the expected time taken to re-establish normal use following an event	The impact of flooding can be long lasting well after the event has taken place affecting both the property which has been flooded and the lives that have been disrupted. The resilience of the community to get back to normal will be important including time taken to repair / replace damages.

9.4 Flood Awareness

Emergency planners may also use the outputs from this SFRA to raise awareness within local communities. This should include awareness of flood risks, roles and responsibilities and measures that people can take to make their homes more resilient to flooding from all sources, whilst also encouraging all those at fluvial flood risk to sign up to the Environment Agency's Floodline Warnings Direct[44] service.

It is also recommended that Category 1 responders are provided with appropriate flood response training to help prepare them for the possibility of a major flood with an increased number of people living within flood risk areas, to ensure that adequate pre-planning, response and recovery arrangements are in place.

44 https://fwd.environment-agency.gov.uk/app/olr/home

Appendices

A Evaluation of flood risk of potential development sites to inform the Local Plan

Includes three Excel spreadsheets providing an assessment of flood risk at the preferred development sites. This is based on Flood Zones 2, 3a and 3b, as delineated in this SFRA, and also the Risk of Flooding from Surface Water dataset (RoFSW). Also accompanied by a standalone report summarising risk and recommendations for the preferred development sites.

Appendix A - Evaluation of flood risk of potential development sites to inform the Local Plan

A.1 Potential and preferred sites for development

Craven District Council's (CDC) Strategic Housing and Employment Land Availability Assessment (SHELAA) sets out a list of sites that have been suggested as having potential for either housing development, for economic development (employment sites) or both (mixed use). The SHELAA essentially sets out the choice of development sites available to CDC for consideration in the Local Plan. Maintaining the SHELAA helps the council to meet one of the requirements of the National Planning Policy Framework (NPPF), which is to demonstrate a sufficient supply of potential sites that are suitable for residential development according to local housing requirements as well as sites for economic development uses. In addition to SHELAA sites, for the Local Plan, other potential sites have also been identified by CDC based on a broad range of sources as suggested in Planning Practice Guidance (PPG), including existing planning commitments and sites promoted through a "call for sites" exercise (carried out in 2014 as part of the pre-publication of the Local Plan). The inclusion of a site in the list of potential sites does not mean it will be developed; the assessment evaluates suitability for development, availability and the likelihood of development being financially viable, but this process does not include policy decisions.

The NPPF identifies advantages of carrying out land assessments for housing and economic development as part of the same exercise in order that sites may be allocated for the most appropriate use. Since 2015 the Planning Practice Guidance (PPG) has also included guidance on undertaking a joint assessment of both housing and economic land availability. In line with this guidance CDC has carried out the land assessment for housing and employment sites in a joined up manner.

Development site allocations are normally steered to areas with minimal flood risk (preferably in Flood Zone 1). Flood risk was an integral and consistent criterion for CDC when arriving at the list of preferred sites, with reference being made to the most recent Environment Agency flood maps and information contained within the 2010 Level 1 SFRA.

The draft final list of preferred sites includes:

- Housing (63 sites)
- Employment (11 sites)
- Mixed use (6 sites), including housing and employment

For housing sites CDC has subsequently further refined the boundaries of preferred sites to exclude areas that are currently in Flood Zone 2 (FZ2) or Flood Zone 3 (FZ3). The excluded areas are intended to be reserved as green or open space that will not be developed. CDC have therefore developed a final list of sites for housing which includes only the net developable areas outside of FZ2 and FZ3 to take forward.

The more detailed assessment of flood risk that is reported in this appendix draws on the updated SFRA and therefore considers other sources of flooding in addition to the flood zone maps. Flood risk has been assessed for sites on the preferred list using both the original site boundaries **as well as** the boundaries that have been refined to show only the net developable areas.

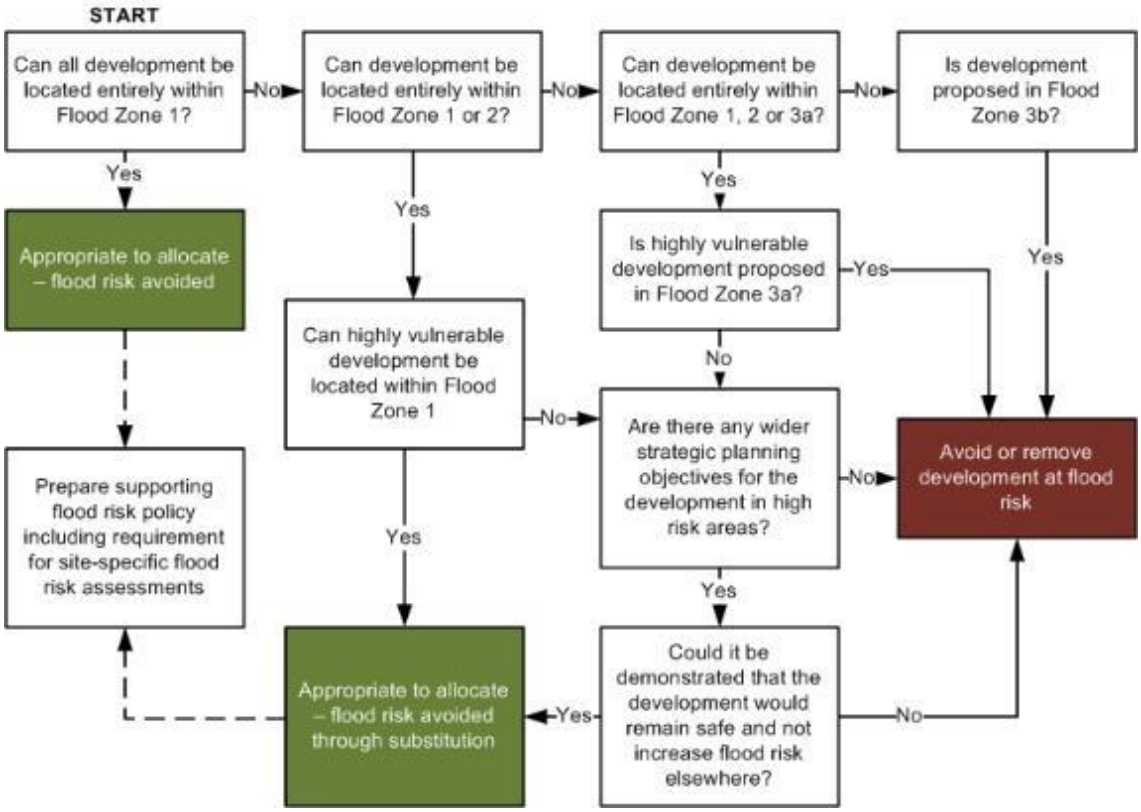
A.2 The Sequential Approach and other considerations

A.2.1 The Sequential Approach

The Sequential Approach for allocation of development through the Local Plan is illustrated in Figure A.2-1. The main SFRA report documents the principles and practice in more detail. By following the Sequential Approach councils are able to better ensure that any potential development sites that have significant flood risk implications are substituted for other sites that are considered to be at lower flood risk, providing these are suitable for development on economic or practical grounds. In this way the Local Plan will be able to make policy recommendations regarding site allocations that are as robust as possible in terms of flood risk by directing development away from areas at flood risk, now and in the future.

Although the Sequential Approach is focused on fluvial flood risk, other sources of flooding need to be considered. For example, a site could be entirely in Flood Zone 1 (FZ1), but suffer from surface water or sewer flood risk and therefore be considered unsuitable for development.

Figure A.2-1: Local Plan Sequential Approach to site allocation



A.2.2 Exception Test

If it is not possible within the context of the Local Plan, for all development to be located in zones with a lower probability of flooding, it would be necessary to demonstrate that the requirements of the Exception Test can be achieved. In which case it would need to be demonstrated that any developments in areas of higher flood risk would provide wider sustainability benefits to the community, and that these benefits would outweigh any flood risk implications. This Strategic Flood Risk Assessment helps to inform on this.

For each development a site-specific flood risk assessment would also be required to demonstrate that it will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

A.2.3 Sustainability Appraisal

By avoiding potential sites identified as being at significant fluvial flood risk or by considering how changes in site layout can avoid those parts of a site at flood risk, the Council would be demonstrating a sustainable approach to development.

In terms of surface water, the same approach should be followed whereby those sites at highest risk should be avoided or site layout should be tailored to ensure sustainable development. This should involve investigation into appropriate SuDS techniques (covered in the SFRA report). The designation of Critical Drainage Areas, either through formal notification from the Environment Agency or for use in CDC's Local Plan policy, could also provide sustainability benefits by ensuring that any site within a CDA that is >0.5 hectares should be subject to a site-specific FRA and be subject to a larger reduction on existing runoff rates to ensure appropriate mitigation of surface water risk.

Once the council has decided on a final list of sites following application of the Sequential Test and, where required, the Exception Test following a site-specific FRA, a phased approach to development should be carried out to avoid any cumulative impacts that multiple developments may have on flood risk. For example, for any site where it is required to develop in Flood Zone 3, detailed modelling would be required to ascertain where water displaced by development may flow and to calculate subsequent increases in downstream flood volumes. The modelling should investigate scenarios based on compensatory storage techniques to ensure that downstream or nearby sites are not adversely affected by development on other sites.

Using a phased approach to development, based on modelling results of floodwater storage options, should ensure that any sites at risk of causing flooding to other sites are developed first in order to ensure flood storage measures are in place before other sites are developed, thus ensuring a sustainable approach to site development. Also, it may be possible that flood mitigation measures put in place at sites upstream could alleviate flooding at downstream or nearby sites.

A.2.4 Safeguarded Land for Flood Storage

Where possible, the council may look to allocate land designed for flood storage functions. Such land can be explored through the site allocation process whereby an assessment is made, using this SFRA, of the flood risk at potential sites and what benefit could be gained by leaving the site undeveloped. In some instances, the storage of flood water can help to alleviate flooding elsewhere, such as downstream developments. Where there is a large area of a site at risk that is considered large enough to hinder development, it may be appropriate to safeguard this land for the storage of flood water.

Sites that would potentially be suitable for flood storage would be any greenfield sites that meet any one or more (ideally) of the following criteria:

- Are considered to be large enough (>1 hectare) to store flood water to achieve effective mitigation.
- Have large areas of their footprint at risk from 1 in 30-year or 1 in 100-year surface water flood events - based on the Environment Agency's Risk of Flooding from Surface Water dataset (RoFSW).
- Are within the functional floodplain (Flood Zone 3b).
- Have large areas of their footprint at risk from Flood Zone 3a.
- Are large enough and within a suitable distance to receive flood water from a nearby development site using appropriate SuDS techniques which may involve pumping, piping or swales / drains.

Brownfield sites could also be considered though this would entail site clearance of existing buildings and conversion to greenspace.

A.2.5 Summary of Development Options

Rejection of site

A site which fails to pass the Sequential Test and/or the Exception Test would be rejected. Rejection would also apply to any residential dwelling or employment site within Flood Zone 3b. The Flood Risk and Coastal Change PPG flood risk vulnerability classification states that only water-compatible uses and essential infrastructure should be permitted in Flood Zone 3b, though any essential infrastructure must pass the Exception Test. Land allocated for housing falls in to the more vulnerable category, mixed use sites that entail residential fall into the more vulnerable category, employment sites fall into the less vulnerable category and gypsy and traveller sites are considered highly vulnerable. Development should not be permitted for sites within the highly vulnerable, more vulnerable and less vulnerable categories that fall within Flood Zone 3b. If the developer is able to avoid 3b, part of the site could still be delivered.

In terms of surface water flood risk, if risk is considered significant or where the size of the site does not allow for on-site storage or application of appropriate SuDS then such sites could be rejected.

Exception Test required

For those sites that, according to the FRCC-PPG vulnerability tables, would require the Exception Test, the likelihood of passing the test should be assessed as part of a Level 2 Strategic Flood Risk Assessment. Only water-compatible and less vulnerable uses of land would not require the Exception Test in Flood Zone 3a. More vulnerable uses, including residential, and essential infrastructure are only permitted if the Exception Test is passed and all development proposals in Flood Zone 3a must be accompanied by a Flood Risk Assessment. To avoid having to apply the Exception Test, the developer / LPA should attempt to avoid the risk area altogether.

Consideration of site layout and design

Site layout and site design is important at the site planning stage where flood risk exists. The site area would have to be large enough to enable any alteration of the developable area of the site to remove development from the functional floodplain, or to leave space for on-site storage of flood water within Flood Zone 3a. Careful layout and design at the site planning stage may apply to such sites where it is considered viable based on the level of risk. Surface water risk and opportunities for SuDS should also be assessed during the planning stage.

Depending on local circumstances, if it is not possible to adjust the site boundary to remove the site footprint from Flood Zone 3b to a lower risk zone then development should not be permitted. If it is not possible to adjust the developable area of a site to remove the proposed development from Flood Zone 3a to a lower risk zone or to incorporate the on-site storage of water within site design, then the Exception Test would have to be passed as part of a site-specific Flood Risk Assessment.

Any site layout and design options should take account of the 8 metre easement buffer along watercourses where development is not permitted. This easement buffer is recommended by the Environment Agency to allow ease of access to watercourses for maintenance works. Any site redesign, where Flood Zone 3a is included within the site footprint, should allow water to flow naturally or be stored in times of flood through application of appropriate SuDS techniques.

Flood Risk Assessment

The SFRA report provides further guidance on the adoption of site-specific Flood Risk Assessments.

Site should be permitted on flood risk grounds

Development sites could be allocated or granted planning permission where the Sequential Test and the Exception Test (if required) are passed. In addition, a site is likely to be permitted without the need to assess flood risk where the proposed use is for open space. Assuming the site is not to include any development and is to be left open then the proposal is likely to be acceptable from a flood risk point of view. For such sites, opportunities for flood storage should be explored however as part of an FRA.

All development proposals within flood zones 2 or 3 must be accompanied by a Flood Risk Assessment. Any sites 100% within Flood Zone 1 that are 1 hectare or more in area must be accompanied by a Flood Risk Assessment to determine vulnerability to flooding from other sources as well as fluvial. The FRA should determine the potential of increased flood risk elsewhere as a result of the addition of hard surfaces on-site and the effect of new development on surface water runoff.

The Flood Risk and Coastal Change PPG states:

"Local authorities and developers should seek opportunities to reduce the overall level of flood risk in the area and beyond. This can be achieved, for instance, through the layout and form of development, including green infrastructure and the appropriate application of sustainable drainage systems, through safeguarding land for flood risk management, or where appropriate, through designing off-site works required to protect and support development in ways that benefit the area more generally." (Paragraph 50).

A.2.6 Development Options for Sites with a Significant Surface Water Flood Risk

As discussed above, although the Sequential Approach is focused on fluvial flood risk, the risk from other sources of flooding such as surface water can impact on the suitability of a site for development. If a significant risk from surface water exists at the site (based on the Environment Agency's RoFSW), the following development options should be considered:

- Possible withdrawal, redesign or relocation of the site, certainly for those sites at higher risk from the 1 in 30-year event and those with a large percentage area at risk.
- A detailed site-specific Flood Risk Assessment incorporating surface water flood risk management.
- A FRA may want to consider detailed surface water modelling, particularly for the larger sites which may influence sites elsewhere.
- The size of development and the possibility of increased surface water flood risk caused by development on current Greenfield land, and cumulative impacts of this within specific areas.
- Management and re-use of surface water on-site, assuming the site is large enough to facilitate this and achieve effective mitigation.
- Larger sites could leave surface water flood prone areas as open greenspace, incorporating social and environmental benefits.
- Effective surface water management should ensure risks on and off site are controlled.
- SuDS should be used where possible. Appropriate SuDS may offer opportunities to control runoff to Greenfield rates. Restrictions on surface water runoff from new development should be incorporated into the development planning stage. For brownfield sites, where current infrastructure may be staying in place, then runoff should attempt to mimic that of Greenfield rates, unless it can be demonstrated that this is unachievable or hydraulically impractical.

The delineation of areas of critical drainage may be appropriate for areas particularly prone to surface water flooding. Detailed analysis and consultation with the LLFA, the water companies (Yorkshire Water and United Utilities), and the Environment Agency would be required. It may then be beneficial to carry out a Surface Water Management Plan (SWMP) or drainage strategy for targeted locations within any such areas of critical drainage. Investigation into the capacity of existing sewer systems would be required in order to identify critical parts of the system. Drainage model outputs could be obtained to confirm the critical parts of the drainage network and subsequent recommendations could then be made for future development i.e. strategic SuDS sites, parts of the drainage system where any new connections should be avoided, and parts of the system that may have any additional capacity and recommended runoff rates

A.3 General flood risk implications of Preferred Sites

A.3.1 High level screening

In order to inform the first part of the Sequential Approach for allocation of development through the Local Plan, a high level flood risk screening exercise has been undertaken. This has involved using GIS software to determine how the boundaries of the Preferred Sites intersect with:

i) Flood Zones 1, 2, 3a and 3b, thereby indicating the degree of fluvial flood risk

ii) the Environment Agency's Risk of Flooding from Surface Water dataset (RoFSW), thereby helping to identify the degree of surface water flood risk and likelihood of critical drainage problems.

A set of Development Site Assessment spreadsheets are provided alongside this appendix. These provide a breakdown of the area (ha) and percentage coverage of each flood zone and each surface water flood zone within each site. For housing sites an additional spreadsheet gives the same data based on net developable area boundaries only.

Fluvial flood risk

In assessing fluvial flood risk Flood Zones 3b, 3a and 2 are considered in isolation. Any area of a site within the higher risk Flood Zone 3b that is also within Flood Zone 3 is excluded from Flood Zone 3a and any area within Flood Zone 3a is excluded from Flood Zone 2. This allows the sequential assessment of risk at each site by addressing those sites at higher risk first. Table A.3-1 documents how many of the Preferred Sites fall within each Flood Zone, considering the full site boundaries rather than the net ones (which already exclude areas within in Flood Zones 2 and 3).

Table A.3-1: Number of development sites at risk from Flood Map for Planning flood zones

Potential Development Site	Number of sites within…		
	Flood Zone 3b	Flood Zone 3a	Flood Zone 2
Housing	2	12	18
Employment	1	2	4
Mixed use	2	3	3
TOTAL	**5**	**17**	**25**

Of the 80 Preferred Sites, 5 have parts of their footprints within Flood Zone 3b, and 17 have parts of their footprint within Flood Zone 3a. A further 25 have parts of their footprint in Flood Zone 2.

Recommendation:

Despite having decided to exclude parts of development sites falling in either Flood Zone 3 or Flood Zone 2, CDC should use the Development Site Assessment spreadsheets to identify which sites should be avoided during the Sequential Test. The spreadsheet can also be used to assess whether or not economic and housing projections can be met by purely allocating sites in areas at low risk of flooding.

If this is not the case, or where wider strategic objectives require regeneration in areas already at risk of flooding, then CDC should consider the compatibility of vulnerability classifications and Flood Zones (refer to FRCC-PPG) and whether or not the Exception Test will be required before finalising sites. The decision making process on site suitability should be transparent and information from this SFRA should be used to justify decisions to allocate land in areas at high risk of flooding.

Surface water flood risk

The surface water risk for each of the Preferred sites has been evaluated based on the RoFSW dataset. The RoFSW includes three flood outlines - indicating the risk in the 1 in 30-year, 1 in 100-year and 1 in 1000-year surface water flood events respectively. These can be considered as representing high, medium and low risk of surface water flooding. Table A.3-2 summarises the number of sites at risk from each surface water flood zone. Note that, in order to allow a sequential assessment of risk at each site, any part of the footprint of a site falling within the higher risk outline was excluded from the medium risk outline and any part of the footprint falling within the medium risk outline was excluded from the lower risk 1 in 1000-year outline.

Of the 45 sites at high risk (affected in 1 in 30-year surface water flood event), six have 10% or more of their site footprint at risk. Five sites have 10% or more of the footprint at medium risk (affected in the 1 in 100-year event). For the lower risk 1 in 1000- year extreme event, six sites have 20% or more of the area at risk.

Table A.3-2: Number of potential development sites at risk from surface water flooding

RoFSW event outline	Number of sites at risk	Number of sites at significant risk*
1 in 30-year (high risk)	45	6
1 in 100-year (medium risk)	53	5
1 in 1000-year (low risk)	62	6
In reality, sites within the 1 in 30-year outline will also be in the 1 in 100-year outline and those within the 1 in 100-year outline will also be in the 1 in 1000-year outline.		
* Significant risk is based on sites with >=10% of footprint falling within 1 in 30-year or 1 in 100-year outlines or sites with >=20% of footprint falling within 1 in 1000-year outline		

A.3.2 Safeguarded Land for Flood Storage

Potential sites covering existing greenfield land that could be safeguarded for flood storage are listed in Table A.3-3. Note that parts of these sites may still be available for development, depending on the percentage area at risk and local conditions. By using the sequential approach to site layout, the LPA and developers should be able to avoid the areas at risk and leave clear for potential flood storage. See the SFRA Maps to spatially assess the areas of the sites at risk.

Table A.3-3: Potential greenfield areas to safeguard for flood storage (assessed from OS mapping)

Site ID	Location	Proposed Use	Area (ha)	Main source of risk	% area at risk
SC037	Land at Ashfield Farm, Skipton Road, Cross Hills	Housing	13.06	FZ3b RoFSW 100 year	44.3 21.2
SK049	Land east of Skipton Bypass, Skipton	Mixed use	23.48	FZ3b RoFSW 100 year	30.8 21.3
SK088	Hawbank Fields, North of Otley Road, Skipton	Housing	12.25	FZ3a RoFSW 30 year	9.4 6.7
IN035	Between industrial estate off New Road and Tatterthorn Lane, Ingleton.	Employment	2.49	FZ3a	41.2
GA009	Land off Eshton Road, north of canal, Gargrave	Housing	3.76	FZ3a RoFSW 30 year	17.4 15.1
SK061	East of canal, west of Sharpaw Avenue, Skipton	Housing	3.66	FZ3a RoFSW 100 year	23.1 7.4

A.4 Flood risk implications for individual sites

A.4.1 Potential Development Sites Review

This section of the report assesses flood risk to each individual site in the Preferred Sites list. It is important to consider that each individual site will require further investigation, as local circumstances may dictate the outcome of the recommendation. Such local circumstances may include the following:

- Existing planning permissions may exist on some site of the Preferred Sites. For these the Environment Agency may have already passed comment and/or agreed to appropriate remedial works concerning flood risk. Previous flood risk investigations/FRAs may already have been carried out at some sites. If sites have planning permission but construction has not started, the SFRA will only be able to influence the design of the development e.g. finished floor levels. New, more extensive flood extents (from new models) cannot be used to reject development where planning permission has already been granted.
- It may be possible at some sites to develop around the flood risk. Planners are best placed to make this judgement i.e. will the site still be deliverable if part of it needs to be retained to make space for flood water.
- Surrounding infrastructure may influence scope for layout redesign/removal of site footprints from risk.
- A number of sites included in the assessment are brownfield rather than greenfield sites. Thus the existing development could be taken into account as further development may not lead to increased flood risk. However, the Environment Agency may have their own views on this in regard to health warnings as new-build properties in risk areas could be built with flood protection in mind

A.4.2 Application of the Sequential Test

The following recommendations provide only a guide, based on the flood risk information made available for this Level 1 SFRA. Information regarding local, site specific information is beyond the scope of this SFRA. It is CDC's responsibility to carry out sequential testing of each site using the information provided in this SFRA and more specifically using their local, site specific knowledge and advice from the Environment Agency. These sections should be read alongside the Development Site Assessment spreadsheets.

The recommendations provided in the spreadsheets DO NOT take account of local circumstances, only the understanding of flood risk based on intersection of the site footprint with the Environment Agency Flood Zone maps.

Recommendation A - Consider Withdrawal of Site

Withdrawal of a Site is recommended to any site within the functional floodplain where any of the following criteria are true:

- **10% or greater of the site area is within Flood Zone 3b.**
- **The scale of surface water risk on the site is considered significant enough that possible mitigation of the risk on site is deemed unlikely to be achievable.**

The FRCC-PPG flood risk vulnerability classification states that only water-compatible uses and essential infrastructure should be permitted in Flood Zone 3b, though any essential infrastructure must pass the Exception Test. Land allocated for housing falls in to the more vulnerable category and sites for employment; retail; recreation and leisure; and mineral and waste are in the less vulnerable category, though waste management sites for hazardous materials fall with the more vulnerable category. Gypsy and traveller sites fall within the highly vulnerable category. Mixed use sites should be placed into the higher of the relevant classes of flood risk sensitivity. Development should not be permitted for sites within the more vulnerable and less vulnerable categories that fall within Flood Zone 3b. If the developer is able to avoid 3b however, then part of the site could still be delivered.

It should be noted that the 10% threshold is not included within any policy, however it is a practicable cut-off point at which it would likely prove difficult for developers to deliver a site, based on the NPPF. This 10% threshold does not account for local circumstances therefore it may be possible to deliver some of the sites included with Recommendation A upon more detailed investigation.

As outlined in Table A.4-1 the assessment has identified two sites where withdrawal should be considered given the large portion of site footprint which falls within the functional floodplain. The SK049 site is proposed for mixed use, although a portion of the area is planned to be used for employment only. CDC asked if the sub-area earmarked for employment only could be considered in addition to the site as a whole. Only the full area proposed as mixed use overlaps considerably with the functional floodplain. A net developable area (NDA) has been defined by CDC for site SC037, which is earmarked for residential development. This NDA has been considered in this assessment in addition to the site as a whole. Only the full area of the site has considerable overlap with the functional floodplain.

The assessment has identified one site where withdrawal should be considered given the large proportion of the site footprint which is at high risk of surface water flooding.

Table A.4-1: Sites to consider withdrawing that are within Flood Zone 3b or with high surface water flood risk

Site ID	Site Name	Proposed Use	Site Area (ha)	% area within FZ3b	% area at surface water flood risk
SC037	Land at Ashfield Farm, Cross Hills	Housing	13.06	44.34	
SK049	Land east of Skipton Bypass, Skipton	Mixed Use	23.48	30.76	
SG084	Land to east of A65 and north of Gildersleets, Giggleswick	Employment	3.09	-	72.49

Recommendation B - Exception Test

Recommendation B applies to sites where it is likely the Exception Test would be required because the development lies wholly or partially within Flood Zone 3a. Recommending that an Exception Test should be applied does not imply that there is a likelihood that the site would pass the test. These sites would need to be examined as part of a more in-depth Level 2 SFRA. The developer / LPA should attempt to avoid the risk area where possible. Also, all development proposals in Flood Zone 3a must be accompanied by a flood risk assessment.

Recommendation B applies to sites where any of the following criteria are true:

- **10% or greater of any residential site or essential infrastructure site that is within Flood Zone 3a. Only water-compatible and less vulnerable uses of land are appropriate in this zone.**
- **10% or greater of any mixed use site that may entail residential use that is within Flood Zone 3a.**

It should be noted that the 10% threshold is not based on policy; rather it is considered difficult for developers to avoid Flood Zone 3a when 10% or more of the site footprint is within it. This 10% threshold does not account for local circumstances - for some of the sites flagged for Exception Test it may be possible to avoid Flood Zone 3a altogether with careful development design.

Table A.4-2 lists the five sites where Recommendation B should apply based on the 10% threshold of the site footprint being within Flood Zone 3a. All of these have been flagged for housing and CDC has already considered reduced site footprints to minimise encroachment into FZ3 (but note the assessment is based on the full site footprint not the net). Details of these sites are given in the Development Site Assessment spreadsheets.

Table A.4-2: Sites where application of the Exception Test would be required

Site ID	Site Name	Proposed use	Site Area (ha)	% Area within FZ3a
GA009	Land off Eshton Road, north of canal, Gargrave	Housing	3.76	17.43
IN010	Caravan Park, north of River Greta, Ingleton	Housing	0.63	19.89
IN029	East of New Village and south of Low Demesne, Ingleton	Housing	15.05	10.85
SG086	Land to the east of Raines Road and immediately south of Brackenber Close, Giggleswick	Housing	0.94	12.10
SK061	East of canal, west of Sharphaw Avenue, Skipton	Housing	3.66	23.05

Recommendation C - Consider site layout and design

Any site that is classified as Recommendation C should undergo a review of site layout and/or design at the development planning stage in order for development to proceed. A Level 2 SFRA or site-specific FRA would be required to inform on site layout and design.

Recommendation C applies to sites where any of the following criteria are true:

- **<10% of the area of any site type is within Flood Zone 3b.**
- **<10% of any residential site is within Flood Zone 3a.**
- **<10% of any mixed use site that may entail residential use is within Flood Zone 3a.**
- **<10% of any essential infrastructure site is within Flood Zone 3a.**

The 10% threshold is not included within any policy, it is merely considered that it may be possible for developers to avoid Flood Zone 3b and Flood Zone 3a when less than 10% of the site area is at risk. This 10% threshold does not account for local circumstances.

The Development Site Assessment spreadsheets categorise as Recommendation C those Preferred Sites having less than 10% of their area within Flood Zone 3b, such that site layout should be examined with a view to removing the site footprint from Flood Zone 3b. For a number of these sites CDC have already undertaken such considerations resulting in net site areas. Depending on local circumstances, it may not be possible to successfully adjust the site boundary to remove the site footprint from Flood Zone 3b to a lower risk zone. In such cases development should not be permitted.

Also listed as Recommendation C within the spreadsheets are the sites which have a small proportion (<10%) of their footprint within Flood Zone 3a. The additional comments provided within the spreadsheets differentiate these from the sites falling under Recommendation C due to overlap with FZ3b. For these sites, site layout and/or design should be examined with a view to removing the site footprint from Flood Zone 3a or incorporating on-site storage of water into the site design. Any site layout and design should take account of the 8 metre easement buffer along watercourses where development is not permitted. This easement buffer is recommended by the Environment Agency to allow ease of access to watercourses for maintenance works. Any site redesign, where Flood Zone 3a is included within the site footprint, should allow water to flow naturally or be stored in times of flood through application of suitable SuDS. Depending on local circumstances, if it is not possible to reduce flood risk through site layout or design, then the Exception Test should be undertaken and passed as part of a site-specific FRA.

Overall there are nine potential sites to which Recommendation C applies, listed in Table A.4-3.

Table A.4-3: Sites to consider layout and design to avoid risk areas

Site ID	Site Name	Proposed Use	Site Area (ha)
CN006	Station Works, north of Cononley Lane, Cononley	Mixed Use	2.17
SC085	Land at Malsis, Glusburn	Mixed Use	12.66
SG014	Land adjacent to Lord's Close and Sandholme Close, Giggleswick	Housing	0.93
SG087	Land to the east of Raines Road, Giggleswick	Housing	2.34
SK044	Former allotments and garages, Broughton Road, Skipton	Housing	0.59
SK049 (Employment Only)	Land east of Skipton Bypass, Skipton	Employment	5.03
SK060	Business premises and land, west of Firth Street, Skipton	Housing	2.35
SK088	Hawbank Fields, North of Otley Road and South of A6132, Skipton	Housing	12.25
SK101	East of Keighley Road and south of Cawder Lane, Skipton	Housing	4.00

Recommendation D – Development could be permitted subject to FRA

For those sites classified as Recommendation D, development could be permitted if a site-specific FRA shows the site can be safe and if it is demonstrated that the site is sequentially preferable. A site within Flood Zone 2 could still be rejected if the conclusions of the FRA state that development is unsafe or inappropriate.

Recommendation D applies to sites where any of the following criteria are true:

- **Any site within Flood Zone 2 that does not have any part of its footprint within Flood Zone 3a.**
- **Employment sites within Flood Zone 3a assuming the site use falls within the less vulnerable or water-compatible category of the flood risk vulnerability classification of the FRCC-PPG. No part of the site can be within Flood Zone 3b.**
- **Any site 100% within Flood Zone 1 where surface water flood risk is considered to be significant enough so as to require investigation through a site-specific FRA.**
- **Any site 100% within Flood Zone 1 that is greater than or equal to 1 hectare in area.**

Recommendation D applies to 43 sites in the Preferred List, which are listed in Table A.4-4. Where these relate to sites proposed for residential development the recommendation is based on the full site areas and not the net ones. The sites that might fall under Recommendation D due to surface water considerations are flagged separately in Section A.4.3. Comments are also provided in the Development Assessment Spreadsheet to highlight where this is the case.

All development proposals within Flood Zone 2 or Flood Zone 3a must be accompanied by a site-specific Flood Risk Assessment. Any sites 100% within Flood Zone 1 that are equal to or greater than 1 hectare in area must be accompanied by a site-specific Flood Risk Assessment to determine vulnerability to flooding from other sources as well as fluvial and tidal. The FRA should determine the potential of increased flood risk elsewhere as a result of the addition of hard surfaces on-site and the effect of new development on surface water runoff. Paragraph 50 of the FRCC-PPG states:

"Local authorities and developers should seek opportunities to reduce the overall level of flood risk in the area and beyond. This can be achieved, for instance, through the layout and form of development, including green infrastructure and the appropriate application of sustainable drainage systems, through safeguarding land for flood risk management, or where appropriate, through designing off-site works required to protect and support development in ways that benefit the area more generally.".

Table A.4-4: Sites where development could be permitted subject to FRA

Site ID	Site Name	Proposed Use	Site Area (ha)
BR016	Gilders, Langholme, and land to the west, Skipton Road, Bradley	Housing	1.28
BU001	West of Ireby Road, Burton in Lonsdale	Housing	2.21
GA031	Land to the west of Walton Close, Gargrave	Housing	1.80
HB014	Land to east of Lairgill Row on Butts Lane, High Bentham	Housing	0.43
HB023	North of Low Bentham Road, rear of Furness Drive, High Bentham	Housing	3.16
HB025	Land to the east of Butts Lane, High Bentham	Housing	2.81
HB026	North of Springfield Crescent and east of Butts Lane, High Bentham	Housing	2.58
HB028	East of Station Road and south-west of Pye Busk, High Bentham	Mixed Use	10.91
HB033	Land east of Butts Lane and north of 1-9 Springfield, High Bentham	Housing	1.84
HB044	Land to west of Goodenber Road, High Bentham	Housing	1.87
HB052	Land to the east of Bank Head Farm and west of Robin Land, High Bentham	Housing	13.13
HE009	Land south of Townson Tractors, off Kendal Road, Hellifield	Housing	1.89
IN015	Corner of Main Street and Laundry Lane, Ingleton	Housing	0.54
IN022	Adjacent to southern edge of industrial estate, off New Road, Ingleton	Employment	1.15
IN028	Between Ingleborough Park Drive and Low Demesne, Ingleton	Housing	6.40
IN035	Between industrial estate off New Road and Tatterthorn Lane, Ingleton	Employment	2.49
KL003	Adjacent to the Old Smithy, Skipton Road, Kildwick	Housing	0.52
SC004	Land at corner of Skipton Road and Keighley Road, Cross Hills	Housing	0.27
SC036	South of Lothersdale Road, Glusburn	Housing	1.24
SC040	Land south of Sutton Lane, Sutton	Housing	3.49
SG025	Land to the south of Ingfield Lane, Settle	Mixed Use	10.27
SG032	Car park, off Lower Greenfoot and Commercial Street, Settle	Housing	0.41
SG063	Land east of Runley Bridge Farm and B6480, Settle	Housing	1.70
SG063	Land east of Runley Bridge Farm and B6480, Settle	Employment	1.70
SG064	Land south of Runley Bridge Farm and west of B6480, Settle	Employment	5.04
SG064	Land south of Runley Bridge Farm and west of B6480, Settle	Mixed Use	5.04
SG067	Land to south east of Runley Bridge Farm, B6480, Settle	Housing	1.99
SG067	Land to south east of Runley Bridge Farm, B6480, Settle	Employment	1.99
SG068	Land to the west of Brockhole Lane, Settle	Housing	2.10
SG079	Land to the north of Town Head Way, Settle	Housing	1.10
SG083	Land at the corner of the A65 and Brackenber Lane, Giggleswick	Employment	6.29
SG085	Land to the west of Raines Road, Giggleswick	Housing	1.08
SK013	East of Aldersley Avenue and south of Moorview Way, Skipton	Housing	7.78
SK018	Land west of Whinny Gill Rd (garages), Skipton	Housing	0.10
SK080 (Oct 2016)	Land north of Gargrave Road and south of A65, Skipton	Housing	2.58

Site ID	Site Name	Proposed Use	Site Area (ha)
SK080a (previously SK080)	Land north of Gargrave Road and south of A65, Skipton	Housing	2.58
SK080	Land north of Skipton Auction Mart, Skipton	Employment	1.65
SK081	Land north of Gargrave Road and west of Parkwood Drive and Stirtonber, Skipton	Housing	4.97
SK089	Land at Elsey Croft, south of Otley Road, Skipton	Housing	8.20
SK090	Land north of Airedale Avenue and east of railway line, Skipton	Housing	2.62
SK108	Land west of Park Wood Drive and Stirtonber, Skipton	Housing	10.97
SK113	Land between Skipton Auction Mart and canal, Skipton	Employment	3.84
SK114	Cawder Ghyll/Horse Close and garages off Cawder Road, Skipton	Housing	4.72
SK135	Skipton Rock Quarry, Harrogate Road, Skipton	Employment	4.61

Recommendation E - Should be permitted on flood risk grounds subject to consultation with the LPA / LLFA

Recommendation E relates to cases where, based on the evidence provided within this SFRA, the development may be permitted on flood risk grounds. Further investigation may be required by the developer and the council should be consulted as to whether a FRA may be required based on any further or new information that may not have been included within this SFRA. Recommendation E applies to:

- **Any site with its area 100% within Flood Zone 1 and with either no risk or minimal risk from surface water, based on the Risk of Flooding from Surface Water map.**

As shown in Table A.4-5, 20 of the Preferred Sites appear to be suitable for permitted development, which equates to a quarter (25%) of the sites assessed. Where these relate to sites proposed for residential development the recommendation is based on the full site areas and not the net ones.

Table A.4-5: Sites where development could be permitted subject to consultation

Site ID	Site Name	Proposed Use	Site Area (ha)
BR002	Holly Tree House and land to the rear, Bradley	Housing	0.50
BU012	Richard Thorton's C.E. Primary School, Burton in Lonsdale	Housing	0.74
CA015	Carla Beck Farm, Carleton	Housing	0.98
CA016	Land to the east of The Old Byre, Carla Beck Lane, Carleton	Housing	0.67
EM006	Land on the west side of entrance to Embsay Station, Embsay	Housing	0.26
GA004	Neville House, Neville Crescent, Gargrave	Housing	0.42
HB011	Primary school, east of Robin Lane, west of Lowcroft, High Bentham	Housing	0.96
HB038	Land south of Low Bentham Road, High Bentham	Housing	0.89
IN006	CDC Car Park, Backgate, Ingleton	Housing	0.18
IN050	Land bounded by the A65 and Raber Top Lane, Ingleton	Housing	0.49
LB012	Wenning View, Low Bentham Road, Low Bentham	Housing	0.57
LB015	North of Harley Close, Low Bentham	Housing	0.55
RA001	Hollins Croft, Rathmell	Housing	0.77
RA004	Land to the south west of Gooselands, Rathmell	Housing	0.22

Site ID	Site Name	Proposed Use	Site Area (ha)
SC071	Ling Haw Hill, Cononley Road, Glusburn	Housing	0.93
SG027	Land to the south of Brockhole View and west of Brockhole Lane, Settle	Housing	0.82
SG035	West Yorkshire Garage, Duke Street, Settle	Housing	0.16
SG042	NYCC Depot, Kirkgate, Settle	Housing	0.25
SK052	Croft House, Carleton Road, Skipton	Housing	0.29
SK082	Land bounded by White Hills Lane and A65, Skipton	Housing	0.84

A.4.3 Assessment of surface water flood risk

NOTE: This assessment of surface water risk to sites DOES NOT take account of local circumstances, only that part of a site area falls within a surface water flood outline of the Risk of Flooding from Surface Water map.

The following table identifies those sites that have a significant risk of surface water flooding and as such it could prove difficult to manage this surface water on-site. For these sites, a site-specific FRA should be carried out to investigate possible mitigation measures for flood storage or infiltration techniques through appropriate SuDS. Otherwise the sites might best be withdrawn from the list of Preferred sites, particularly where the site is at higher risk or has a large percentage area at risk.

The percentage thresholds applied as representing where surface water flood risk is considered to be significant enough to impact on development are 10% of footprint within 1 in 30-year or 1 in 100-year outlines, or 20% in 1 in 1000-year outline. These are not based on policy but are representative of likely scenarios where surface water considerations might prevent development if no mitigation can be achieved.

Table A.4-6: Sites to consider withdrawing based on surface water risk

Site ID	Proposed use	Site Area (ha)	% Area within 1 in 30 Year Outline (RoFSW)	% Area within 1 in 100 Year Outline (RoFSW)	% Area within 1 in 1000 Year Outline (RoFSW)
GA009	Housing	3.76	15.07		
HB014	Housing	0.43	50.73		
IN015	Housing	0.54	17.62		
SC037	Housing	13.06		21.22	34.90
SG025	Mixed Use	10.27	25.26	18.75	36.36
SG032	Housing	0.41			31.42
SG083	Employment	6.29	16.95	11.13	21.00
SG084	Employment	3.09	72.49	10.49	
SG087	Housing	2.34			28.00
SK018	Housing	0.10			26.77
SK049	Mixed Use	23.48		21.25	

Craven District Council

Local Plan Potential Development Sites Assessment

Overall Preferred Sites

31 October 2016

Summary Table

			Flood Zone Coverage								Risk of Flooding from Surface Water					
			Flood Zone 1		Flood Zone 2		Flood Zone 3a		Flood Zone 3b (2016 SFRA)		1 in 30 year		1 in 100 year		1 in 1000 year	
Proposed Use	Number of Sites	Area (ha)	Area (ha)	No. 100%	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.
Housing	60	153.12	146.56	44	1.79	16	4.76	11	0.01	1	4.74	31	2.44	39	7.98	46
Mixed Use	2	14.83	13.42	0	0.39	2	0.92	2	0.09	1	0.33	2	0.26	2	1.55	2
TOTAL	62	168	160	44	2	18	6	13	0	2	5	33	3	41	10	48

Main Table

				Flood Zone Coverage								Risk of Flooding from Surface Water							
				Flood Zone 1		Flood Zone 2		Flood Zone 3a		Flood Zone 3b (2016 SFRA)		1 in 30 year		1 in 100 year		1 in 1000 year			
Site Reference	Site Name	Proposed Use	Area (ha)	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Development Viability	Strategic Recommendation (see Report)	Additional Comments
BR002	Holly Tree House and land to the rear, Bradley	Housing	0.50	0.50	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
BR016	Gilders, Langholme, and land to the west, Skipton Road, Bradley	Housing	1.28	1.28	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	1.39	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha. CDC data suggests local flood risk along Skipton Road and Heath Crescent near to the site.
BU001	West of Istitv Road, Burton in Lonsdale	Housing	2.21	2.21	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.28	0.00	0.04	0.00	0.03	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
BU012	Richard Thorton's C.E. Primary School, Burton in Lonsdale	Housing	0.74	0.74	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
CA015	Carla Beck Farm, Carleton	Housing	6.98	6.98	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	2.45	0.02	1.79	0.06	6.36	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
CA016	Land to the east of The Old Byre, Carla Beck Lane, Carleton	Housing	0.67	0.67	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
CN006	Station Works, north of Cononley Lane, Cononley	Mixed Use	2.17	1.92	88.36	0.09	3.27	0.11	5.01	0.09	4.37	0.00	0.11	0.00	0.19	0.10	4.75	Consider site layout and design	Recommendation C	A small part of the site is currently in FZ3b, the northern periphery intersects with a designated flood storage area on Moorfoot Lane. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
EM006	Land on the west side of entrance to Embsay Station, Embsay	Housing	0.26	0.26	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
GA004	Neville House, Neville Crescent, Gargrave	Housing	0.42	0.42	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	8.09	0.02	4.39	0.04	9.47	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
GA009	Land off Ashton Road, north of canal, Gargrave	Housing	3.78	3.04	80.85	0.06	1.71	0.66	17.43	0.00	0.00	0.57	15.07	0.11	2.89	0.35	9.25	Exception Test	Recommendation B	10% or more of the site lies within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change. Significant risk from surface water flooding.
GA031	Land to the west of Walton Close, Gargrave	Housing	1.80	1.80	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha. CDC data suggests local flood risk along Marton Road near to the site.
HB011	Primary school, east of Robin Lane, west of Lowcroft, High Bentham	Housing	0.96	0.96	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
HB014	Land to east of Laingill Row on Butts Lane, High Bentham	Housing	0.43	0.43	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	50.73	0.03	7.81	0.05	12.29	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but with significant risk from surface water flooding.
HB023	North of Low Bentham Road, rear of Furness Drive, High Bentham	Housing	3.16	3.16	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	4.73	0.03	0.94	0.28	8.36	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
HB025	Land to the east of Butts Lane, High Bentham	Housing	2.81	2.81	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	5.38	0.04	1.54	0.10	3.60	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
HB026	North of Springfield Crescent and east of Butts Lane, High Bentham	Housing	2.58	2.58	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	1.28	0.01	0.24	0.02	0.88	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
HB033	Land east of Butts Lane and north of 1-9 Springfield, High Bentham	Housing	1.84	1.84	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	8.05	0.03	1.42	0.11	6.04	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
HB038	Land south of Low Bentham Road, High Bentham	Housing	0.89	0.89	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
HB044	Land to west of Goodenber Road, High Bentham	Housing	1.87	1.87	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.63	0.00	0.12	0.03	1.81	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
HB052	Land to the east of Bank Head Farm and west of Robin Land, High Bentham	Housing	13.13	13.13	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	2.15	0.14	1.10	0.62	4.70	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
HE009	Land south of Townson Tractors, off Kendal Road, Hellifield	Housing	1.89	1.83	96.82	0.06	3.18	0.00	0.00	0.00	0.00	0.03	1.63	0.02	0.94	0.09	4.85	Could be permitted subject to FRA	Recommendation D	Part of the site falls within FZ2. No parts of the site in FZ3. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
IN006	CDC Car Park, Backgate, Ingleton	Housing	0.18	0.18	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
IN010	Caravan Park, north of River Greta, Ingleton	Housing	0.63	0.48	75.73	0.03	4.38	0.12	19.89	0.00	0.00	0.01	1.35	0.00	0.28	0.04	6.90	Exception Test	Recommendation B	10% or more of the site lies within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
IN015	Corner of Main Street and Laundry Lane, Ingleton	Housing	0.54	0.54	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	17.62	0.04	7.74	0.03	5.50	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but with significant risk from surface water flooding.
IN028	Between Ingleborough Park Drive and Low Demesne, Ingleton	Housing	6.40	6.40	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	8.74	0.16	2.47	0.60	9.45	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
IN029	East of New Village and south of Low Demesne, Ingleton	Housing	15.05	12.93	85.90	0.49	3.25	1.63	10.85	0.00	0.00	0.86	5.70	0.43	2.87	1.25	8.33	Exception Test	Recommendation B	10% or more of the site lies within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
IN050	Land bounded by the A65 and Raber Top Lane, Ingleton	Housing	0.49	0.49	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.05	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
KL003	Adjacent to the Old Smithy, Skeiton Road, Kildwick	Housing	0.52	0.51	98.89	0.01	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.36	Could be permitted subject to FRA	Recommendation D	A small part of the site falls within FZ2. No parts of the site in FZ3. The southern edge of site borders on the historic flood map outline. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
LB012	Wanning View, Low Bentham Road, Low Bentham	Housing	0.57	0.57	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
LB015	North of Harley Close, Low Bentham	Housing	0.55	0.55	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.68	0.00	0.58	0.01	1.69	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
RA001	Hollins Croft, Rathmell	Housing	0.77	0.77	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.03	3.38	0.09	11.98	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
RA004	Land to the south west of Gooselands, Rathmell	Housing	0.23	0.23	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	8.54	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SC036	South of Lotherdale Road, Glusburn	Housing	1.24	1.24	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SC040	Land south of Sutton Lane, Sutton	Housing	3.49	3.32	95.39	0.18	4.61	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.33	0.18	4.56	Could be permitted subject to FRA	Recommendation D	Part of the site falls within FZ2. No parts of the site in FZ3. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SC071	Lino Haw Hill, Cononley Road, Glusburn	Housing	0.93	0.93	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SC085	Land at Malsis, Glusburn	Mixed Use	12.68	11.51	90.89	0.34	2.72	0.81	6.39	0.00	0.00	0.32	2.56	0.26	2.04	1.44	11.40	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change. CDC data suggests local flood risk along A6068 Colne Road adjacent to the site
SG014	Land adjacent to Lord's Close and Sandholme Close, Glusburn	Housing	0.93	0.93	99.27	0.00	0.00	0.01	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SG032	Car park, off Lower Greenfoot and Commercial Street, Settle	Housing	0.41	0.41	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.37	0.13	31.42	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but with significant risk from surface water flooding.
SG035	West Yorkshire Garage, Duke Street, Settle	Housing	0.16	0.16	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SG042	NYCC Depot, Kirkgate, Settle	Housing	0.25	0.25	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	3.46	0.00	1.00	0.05	19.93	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with some risk from surface water flooding.
SG063	Land east of Runley Bridge Farm and B6480, Settle	Housing	1.70	1.70	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG067	Land to south-east of Runley Bridge Farm, B6480, Settle	Housing	1.99	1.99	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG079	Land to the north of Town Head Way, Settle	Housing	1.10	1.10	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.20	0.01	0.69	0.20	18.54	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha. Some risk from surface water flooding.
SG085	Land to the west of Raines Road, Giggleswick	Housing	1.08	1.08	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	2.29	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG086	Land to the east of Raines Road and immediately south of Brackenber Close, Giggleswick	Housing	0.84	0.81	96.03	0.02	1.88	0.11	12.10	0.00	0.00	0.00	0.00	0.06	6.71	0.18	19.25	Exception Test	Recommendation B	10% or more of the site lies within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change. Some risk from surface water flooding.
SG087	Land to the east of Raines Road, Giggleswick	Housing	2.34	2.14	91.47	0.02	0.82	0.18	7.71	0.00	0.00	0.00	0.00	0.03	1.45	0.65	28.00	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change. Significant risk from surface water flooding.
SK013	East of Aldersley Avenue and south of Moorview Way, Skipton	Housing	7.78	7.78	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	2.75	0.08	1.03	0.24	3.14	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK018	Land west of Whinny Gill Rd (paraxes), Skipton	Housing	0.10	0.10	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	26.77	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but with significant risk from surface water flooding.
SK044	Former allotments and garages, Broughton Road, Skipton	Housing	0.59	0.25	43.05	0.29	49.75	0.04	7.21	0.00	0.00	0.00	0.51	0.00	0.45	0.08	12.86	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK052	Croft House, Carleton Road, Skipton	Housing	0.29	0.29	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SK060	Business premises and land, west of Firth Street, Skipton	Housing	2.35	2.35	99.82	0.00	0.04	0.00	0.14	0.00	0.00	0.02	0.80	0.02	0.67	0.19	7.95	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK061	East of canal, west of Shanbaw Avenue, Skipton	Housing	3.69	2.80	76.37	0.02	0.58	0.84	23.05	0.00	0.00	0.18	4.90	0.27	7.38	0.31	8.37	Exception Test	Recommendation B	10% or more of the site lies within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK080 (Oct 2016)	Land north of Gargrave Road and south of A65, Skipton	Housing	2.58	2.58	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	1.64	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK080a	Land north of Gargrave Road and south of A65, Skipton	Housing	2.58	2.58	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	1.64	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK081	Land north of Gargrave Road and west of Parkwood Drive and Skiretber, Skipton	Housing	4.97	4.97	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.32	0.01	0.12	0.25	5.05	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK082	Land bounded by White Hills Lane and A65, Skipton	Housing	0.84	0.84	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SK088	Hawbank Fields, North of Otley Road and South of A6132, Skipton	Housing	12.25	10.70	87.33	0.39	3.17	1.15	9.39	0.01	0.10	0.82	6.65	0.87	5.49	0.84	6.89	Consider site layout and design	Recommendation C	A small part of the site is currently in FZ3b, a small area upstream of the railway culvert is included in the historic flood map. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK089	Land at Elsey Croft, south of Otley Road, Skipton	Housing	8.20	8.19	99.93	0.01	0.07	0.00	0.00	0.00	0.00	0.12	1.48	0.06	0.70	0.21	2.59	Could be permitted subject to FRA	Recommendation D	Part of the site falls within FZ2. No parts of the site in FZ3. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK090	Land north of Airedale Avenue and east of railway line, Skipton	Housing	2.62	2.39	91.19	0.23	8.81	0.00	0.00	0.00	0.00	0.14	5.18	0.06	2.32	0.16	6.20	Could be permitted subject to FRA	Recommendation D	Part of the site falls within FZ2. No parts of the site in FZ3. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK101	East of Keighley Road and south of Cawder Lane, Skipton	Housing	4.00	3.99	99.84	0.00	0.01	0.01	0.15	0.00	0.00	0.01	0.20	0.00	0.09	0.03	0.86	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK108	Land west of Park Wood Drive and Stirtonber, Skipton	Housing	10.97	10.97	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.01	0.11	0.20	1.81	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK114	Cawder Ghyll/Horse Close and garages off Cawder Road, Skipton	Housing	4.72	4.72	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.25	0.02	0.48	0.11	2.23	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.

Craven District Council

Local Plan Potential Development Sites Assessment

Overall Preferred Sites

27 January 2017

Summary Table

			Flood Zone Coverage								Risk of Flooding from Surface Water					
			Flood Zone 1		Flood Zone 2		Flood Zone 3a		Flood Zone 3b (2016 SFRA)		1 in 30 year		1 in 100 year		1 in 1000 year	
Proposed Use	Number of Sites	Area (ha)	Area (ha)	No. 100%	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.
Housing	4	16.25	4.25	2	6.20	2	0.00	1	5.79	1	0.39	2	2.83	2	4.67	2
Mixed Use	2	15.31	15.31	2	0.00	0	0.00	0	0.00	0	2.96	2	2.01	2	3.93	2
TOTAL	**6**	**32**	**20**	**4**	**6**	**2**	**0**	**1**	**6**	**1**	**3**	**4**	**5**	**4**	**9**	**4**

Main Table

				Flood Zone Coverage								Risk of Flooding from Surface Water							
				Flood Zone 1		Flood Zone 2		Flood Zone 3a		Flood Zone 3b (2016 SFRA)		1 in 30 year		1 in 100 year		1 in 1000 year			
Site Reference	Site Name	Proposed Use	Area (ha)	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Development Viability	Strategic Recommendation (see Report)	Additional Comments
SC004	Land at corner of Skipton Road and Keighley Road, Cross Hills	Housing	0.27	0.25	93.67	0.02	6.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Note that the flood risk in parts of the development footprint currently within FZ2 may increase to FZ3 maonitudes in future due to climate change.
SC037	Land at Ashfield Farm, Skipton Road, Cross Hills (Overall Preferred Site)	Housing	13.06	1.08	8.30	6.18	47.34	0.00	0.00	5.79	44.36	0.29	2.23	2.77	21.22	4.56	34.90	Consider withdrawal of Site	Recommendation A	A large portion of this area is within the Functional Floodplain. Further, the flood risk in parts of this area which are currently within FZ2 may increase to FZ3 magnitudes in future due to climate change. Exception test should consider surface water flood risk in particular.
SG025	Land to the south of Ingfield Lane, Settle	Mixed Use	10.27	10.27	100.00	0.00	0.00	0.00	0.00	0.00	0.00	2.60	25.26	1.93	18.75	3.74	36.35	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but note potential significant risk from surface water flooding needs to be evaluated in FRA.
SG027	Land to the south of Brockhole View and west of Brockhole Lane, Settle	Housing	0.82	0.82	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding and under 1Ha in extent
SG064	Land adjacent to B6480, Settle	Mixed Use	5.04	5.04	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	7.28	0.08	1.61	0.19	3.79	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG068	Land to the west of Brockhole Lane, Settle	Housing	2.10	2.10	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	4.71	0.06	2.85	0.11	5.23	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.

Craven District Council

Local Plan Potential Development Sites Assessment

Net Developable Areas

31 October 2016

Summary Table

Proposed Use	Number of Sites	Area (ha)	Flood Zone Coverage: Flood Zone 1 Area (ha)	Flood Zone 1 No. 100%	Flood Zone 2 Area (ha)	Flood Zone 2 No.	Flood Zone 3a Area (ha)	Flood Zone 3a No.	Flood Zone 3b (2016 SFRA) Area (ha)	Flood Zone 3b (2016 SFRA) No.	Risk of Flooding from Surface Water: 1 in 30 year Area (ha)	1 in 30 year No.	1 in 100 year Area (ha)	1 in 100 year No.	1 in 1000 year Area (ha)	1 in 1000 year No.
Housing	59	87.05	85.39	48	0.45	11	1.21	9	0.00	0	1.01	23	0.78	30	3.23	42
Mixed Use	2	14.83	13.42	0	0.39	2	0.92	2	0.09	1	0.33	2	0.26	2	1.55	2
TOTAL	**61**	**102**	**99**	**48**	**1**	**13**	**2**	**11**	**0**	**1**	**1**	**25**	**1**	**32**	**5**	**44**

Main Table

Site Reference	Site Name	Proposed Use	Area (ha)	Flood Zone Coverage: Flood Zone 1 Area (ha)	Flood Zone 1 %	Flood Zone 2 Area (ha)	Flood Zone 2 %	Flood Zone 3a Area (ha)	Flood Zone 3a %	Flood Zone 3b (2016 SFRA) Area (ha)	Flood Zone 3b (2016 SFRA) %	Risk of Flooding from Surface Water: 1 in 30 year Area (ha)	1 in 30 year %	1 in 100 year Area (ha)	1 in 100 year %	1 in 1000 year Area (ha)	1 in 1000 year %	Development Viability	Strategic Recommendation (see Report)	Additional Comments
BR002	Holly Tree House and land to the rear, Bradley	Housing	0.31	0.31	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
BR016	Gilders, Langholme, and land to the west, Skipton Road, Bradley	Housing	0.96	0.96	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.20	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding. CDC data suggests local flood risk along Skipton Road and Heath Crescent near to the site.
BU001	West of Ireby Road, Burton in Lonsdale	Housing	1.25	1.25	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
BU012	Richard Thorton's C.E. Primary School, Burton in Lonsdale	Housing	0.74	0.74	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
CA015	Carla Beck Farm, Carleton	Housing	0.98	0.98	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	2.45	0.02	1.70	0.06	6.36	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
CA016	Land to the east of The Old Byre, Carla Beck Lane, Carleton	Housing	0.67	0.67	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
CN006	Station Works, north of Cononley Lane, Cononley	Mixed Use	2.17	1.92	88.36	0.05	2.27	0.11	5.01	0.09	4.37	0.00	0.11	0.00	0.10	0.10	4.75	Consider site layout and design	Recommendation C	A small part of the site is currently in FZ3b, the northern periphery intersects with a designated flood storage area on Moorfoot Lane. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
EM006	Land on the west side of entrance to Embsay Station, Embsay	Housing	0.26	0.26	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
GA004	Neville House, Neville Crescent, Gargrave	Housing	0.42	0.42	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	8.09	0.02	4.39	0.04	9.47	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
GA009	Land off Eshton Road, north of canal, Gargrave	Housing	1.68	1.68	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.53	0.02	1.24	0.08	4.69	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
GA031	Land to the west of Walton Close, Gargrave	Housing	1.61	1.61	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha. CDC data suggests local flood risk along Marton Road near to the site.
HB011	Primary school, east of Robin Lane, west of Lowcroft, High Bentham	Housing	0.96	0.96	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
HB014	Land to east of Lairgill Row on Butts Lane, High Bentham	Housing	0.43	0.43	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	50.73	0.03	7.81	0.05	12.29	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but with significant risk from surface water flooding.
HB023	North of Low Bentham Road, rear of Furness Drive, High Bentham	Housing	2.02	2.02	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	2.99	0.02	0.76	0.21	10.17	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
HB025	Land to the east of Butts Lane, High Bentham	Housing	0.64	0.64	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
HB026	North of Springfield Crescent and east of Butts Lane, High Bentham	Housing	0.58	0.58	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
HB033	Land east of Butts Lane and north of 1-9 Springfield, High Bentham	Housing	0.75	0.75	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.13	0.00	0.48	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
HB038	Land south of Low Bentham Road, High Bentham	Housing	0.89	0.89	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
HB044	Land to west of Goodenber Road, High Bentham	Housing	1.87	1.87	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.63	0.00	0.12	0.03	1.81	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
HB052	Land to the east of Bank Head Farm and west of Robin Land, High Bentham	Housing	4.63	4.63	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.22	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
HE009	Land south of Townson Tractors, off Kendal Road, Hellifield	Housing	1.10	1.10	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	2.89	0.02	1.65	0.05	4.56	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
IN006	CDC Car Park, Backgate, Ingleton	Housing	0.18	0.18	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
IN010	Caravan Park, north of River Greta, Ingleton	Housing	0.27	0.25	95.65	0.00	0.02	0.01	4.33	0.00	0.00	0.00	0.00	0.00	0.00	0.03	10.46	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
IN015	Corner of Main Street and Laundry Lane, Ingleton	Housing	0.37	0.37	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	13.51	0.04	10.11	0.03	7.76	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but with significant risk from surface water flooding.
IN028	Between Ingleborough Park Drive and Low Demesne, Ingleton	Housing	1.66	1.66	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
IN029	East of New Village and south of Low Demesne, Ingleton	Housing	1.37	1.29	94.18	0.08	5.81	0.00	0.01	0.00	0.00	0.13	9.75	0.09	6.79	0.17	12.59	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
IN050	Land bounded by the A65 and Raber Top Lane, Ingleton	Housing	0.49	0.49	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.05	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
KL003	Adjacent to the Old Smithy, Skipton Road, Kildwick	Housing	0.52	0.51	98.89	0.01	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.36	Could be permitted subject to FRA	Recommendation D	A small part of the site is currently in FZ2. The southern edge of the site borders on the historic flood map outline.
LB012	Wenning View, Low Bentham Road, Low Bentham	Housing	0.57	0.57	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
LB015	North of Harley Close, Low Bentham	Housing	0.55	0.55	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.68	0.00	0.58	0.01	1.69	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
RA001	Hollins Croft, Rathmell	Housing	0.77	0.77	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.03	3.38	0.09	11.98	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
RA004	Land to the south west of Gooselands, Rathmell	Housing	0.22	0.22	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	8.56	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SC036	South of Lothersdale Road, Glusburn	Housing	1.24	1.24	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SC040	Land south of Sutton Lane, Sutton	Housing	0.88	0.88	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05	5.61	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SC071	Ling Haw Hill, Cononley Road, Glusburn	Housing	0.93	0.93	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SC085	Land at Malsis, Glusburn	Mixed Use	12.66	11.51	90.89	0.34	2.72	0.81	6.39	0.00	0.00	0.32	2.56	0.26	2.04	1.44	11.40	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change. CDC data suggests local flood risk along A6068 Colne Road adjacent to the site.
SG014	Land adjacent to Lord's Close and Sandholme Close, Giggleswick	Housing	0.93	0.93	99.27	0.00	0.00	0.01	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SG032	Car park, off Lower Greenfoot and Commercial Street, Settle	Housing	0.41	0.41	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.37	0.13	31.42	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but with significant risk from surface water flooding.
SG035	West Yorkshire Garage, Duke Street, Settle	Housing	0.16	0.16	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SG042	NYCC Depot, Kirkgate, Settle	Housing	0.25	0.25	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	3.46	0.00	1.00	0.05	19.93	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SG063	Land east of Runley Bridge Farm and B6480, Settle	Housing	1.70	1.70	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG067	Land to south east of Runley Bridge Farm, B6480, Settle	Housing	1.99	1.99	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG079	Land to the north of Town Head Way, Settle	Housing	0.48	0.48	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	2.21	0.00	0.68	0.02	3.16	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SG085	Land to the west of Raines Road, Giggleswick	Housing	1.08	1.08	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	2.29	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG086	Land to the east of Raines Road and immediately south of Brackenber Close, Giggleswick	Housing	0.94	0.81	86.03	0.02	1.88	0.11	12.10	0.00	0.00	0.00	0.00	0.06	6.71	0.18	19.25	Exception Test	Recommendation B	10% or more of the site lies within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SG087	Land to the east of Raines Road, Giggleswick	Housing	2.34	2.14	91.47	0.02	0.82	0.18	7.71	0.00	0.00	0.00	0.00	0.03	1.45	0.65	28.00	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK013	East of Aldersley Avenue and south of Moorview Way, Skipton	Housing	4.84	4.84	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	1.19	0.02	0.36	0.08	1.71	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK018	Land west of Whinny Gill Rd (garages), Skipton	Housing	0.10	0.10	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	26.77	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but with significant risk from surface water flooding.
SK044	Former allotments and garages, Broughton Road, Skipton	Housing	0.59	0.25	43.05	0.29	49.75	0.04	7.21	0.00	0.00	0.00	0.51	0.00	0.45	0.08	12.86	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK052	Croft House, Carleton Road, Skipton	Housing	0.29	0.29	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SK060	Business premises and land, west of Firth Street, Skipton	Housing	2.35	2.35	99.82	0.00	0.04	0.00	0.14	0.00	0.00	0.02	0.80	0.02	0.67	0.19	7.95	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK061	East of canal, west of Sharphaw Avenue, Skipton	Housing	3.66	2.80	76.37	0.02	0.58	0.84	23.05	0.00	0.00	0.18	4.90	0.27	7.38	0.31	8.37	Exception Test	Recommendation B	10% or more of the site lies within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK080	Land north of Gargrave Road and south of A65, Skipton	Housing	0.83	0.83	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	3.78	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SK081	Land north of Gargrave Road and west of Parkwood Drive and Stirtonber, Skipton	Housing	0.08	0.08	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.59	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SK082	Land bounded by White Hills Lane and A65, Skipton	Housing	0.52	0.52	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding.
SK088	Hawbank Fields, North of Otley Road and South of A6132, Skipton	Housing	5.84	5.84	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.42	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK089	Land at Elsey Croft, south of Otley Road, Skipton	Housing	4.69	4.69	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	1.91	0.03	0.67	0.09	1.96	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK090	Land north of Airedale Avenue and east of railway line, Skipton	Housing	1.27	1.27	99.46	0.01	0.54	0.00	0.00	0.00	0.00	0.03	2.07	0.01	0.99	0.05	4.10	Could be permitted subject to FRA	Recommendation D	Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK101	East of Keighley Road and south of Cawder Lane, Skipton	Housing	4.00	3.99	99.84	0.00	0.01	0.01	0.15	0.00	0.00	0.01	0.20	0.00	0.09	0.03	0.86	Consider site layout and design	Recommendation C	Part of the site falls within FZ3a. Note that the flood risk in parts of the development footprint currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK108	Land west of Park Wood Drive and Stirtonber, Skipton	Housing	10.20	10.20	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.01	0.12	0.20	1.94	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK114	Cawder Ghyll/Horse Close and garages off Cawder Road, Skipton	Housing	4.72	4.72	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.25	0.02	0.48	0.11	2.23	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.

Craven District Council

Local Plan Potential Development Sites Assessment

Net Developable Areas

27 January 2017

Summary Table

Proposed Use	Number of Sites	Area (ha)	Flood Zone Coverage								Risk of Flooding from Surface Water					
			Flood Zone 1		Flood Zone 2		Flood Zone 3a		Flood Zone 3b (2016 SFRA)		1 in 30 year		1 in 100 year		1 in 1000 year	
			Area (ha)	No. 100%	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.
Housing	4	3.97	3.95	3	0.02	1	0.00	0	0.00	0	0.10	1	0.06	1	0.13	2
Mixed Use	2	14.31	14.31	2	0.00	0	0.00	0	0.00	0	2.98	2	2.01	2	3.93	2
TOTAL	6	18	18	5	0	1	0	0	0	0	3	3	2	3	4	4

Main Table

Site Reference	Site Name	Proposed Use	Area (ha)	Flood Zone Coverage								Risk of Flooding from Surface Water						Development Viability	Strategic Recommendation (see Report)	Additional Comments
				Flood Zone 1		Flood Zone 2		Flood Zone 3a		Flood Zone 3b (2016 SFRA)		1 in 30 year		1 in 100 year		1 in 1000 year				
				Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%			
SC004	Land at corner of Skipton Road and Keighley Road, Cross Hills	Housing	0.27	0.25	93.67	0.02	6.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Note that the flood risk in parts of the development footprint currently within FZ2 may increase to FZ3 maintitudes in future due to climate change.
SC037	Land at Ashfield Farm, Skipton Road, Cross Hills	Housing	0.79	0.79	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding and under 1Ha in extent
SG025	Land to the south of Ingfield Lane, Settle	Mixed Use	10.27	10.27	100.00	0.00	0.00	0.00	0.00	0.00	0.00	2.60	25.28	1.93	18.75	3.74	36.38	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but note potential significant risk from surface water flooding needs to be evaluated in FRA.
SG027	Land to the south of Brockhole View and west of Brockhole Lane, Settle	Housing	0.82	0.82	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Should be permitted on flood risk grounds	Recommendation E	Entirely in FZ1, with minimal or no risk from surface water flooding and under 1Ha in extent
SG064	Land adjacent to B6480, Settle	Mixed Use	5.04	5.04	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	7.28	0.08	1.61	0.19	3.79	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG068	Land to the west of Brockhole Lane, Settle	Housing	2.10	2.10	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	4.71	0.06	2.85	0.11	5.23	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.

Craven District Council

Local Plan Potential Development Sites Assessment

Employment Sites

31 October 2016

Summary Table

Proposed Use	Number of Sites	Area (ha)	Flood Zone Coverage: Flood Zone 1 Area (ha)	Flood Zone 1 No. 100%	Flood Zone 2 Area (ha)	Flood Zone 2 No.	Flood Zone 3a Area (ha)	Flood Zone 3a No.	Flood Zone 3b (2016 SFRA) Area (ha)	Flood Zone 3b (2016 SFRA) No.	Risk of Flooding from Surface Water: 1 in 30 year Area (ha)	1 in 30 year No.	1 in 100 year Area (ha)	1 in 100 year No.	1 in 1000 year Area (ha)	1 in 1000 year No.
Employment	6	22.16	17.40	2	3.25	4	1.41	2	0.10	1	0.92	4	0.29	5	1.35	6
Mixed Use	4	49.39	32.24	1	8.66	3	1.05	3	7.33	2	1.14	4	4.48	4	4.77	4
TOTAL	10	71	50	3	12	7	2	5	7	3	2	8	6	9	7	10

Main Table

Site Reference	Site Name	Proposed Use	Area (ha)	Flood Zone Coverage: Flood Zone 1 Area (ha)	Flood Zone 1 %	Flood Zone 2 Area (ha)	Flood Zone 2 %	Flood Zone 3a Area (ha)	Flood Zone 3a %	Flood Zone 3b (2016 SFRA) Area (ha)	Flood Zone 3b (2016 SFRA) %	Risk of Flooding from Surface Water: 1 in 30 year Area (ha)	1 in 30 year %	1 in 100 year Area (ha)	1 in 100 year %	1 in 1000 year Area (ha)	1 in 1000 year %	Development Viability	Strategic Recommendation (see Report)	Additional Comments
CN006	Station Works, north of Coniston Lane, Coniston	Mixed Use	2.17	1.92	88.36	0.05	2.27	0.11	5.01	0.09	4.37	0.00	0.11	0.00	0.10	0.10	4.75	Consider site layout and design	Recommendation C	Limited parts of the defined area are currently in FZ3a and FZ3b. Also the flood risk in parts of this area which are currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change. Northern periphery of site intersects with a designated flood storage area on Moorfoot Lane in FZ3b.
HB028	East of Station Road and south-west of Pye Busk, Hellifield	Mixed Use	10.91	10.91	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	7.75	0.24	2.24	1.05	9.62	Development could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
IN022	Adjacent to southern edge of industrial estate, off New Road, Ingleton	Employment	1.15	1.09	94.83	0.06	5.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.83	Development could be permitted subject to FRA	Recommendation D	Part of the site falls within FZ2. No parts of the site in FZ3. The flood risk in parts of this area which are currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
IN035	Between industrial estate off New Road and Tatterthorn Lane, Ingleton	Employment	2.49	1.31	52.52	0.18	6.98	1.03	41.18	0.00	0.00	0.07	2.78	0.03	1.39	0.35	14.17	Development could be permitted subject to FRA	Recommendation D	Parts of the defined area are currently in FZ3a, but this is acceptable for Employment sites. Note that the flood risk in parts of this area which are currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SC085	Land at Malsis, Glusburn	Mixed Use	12.69	11.51	90.89	0.34	2.72	0.81	6.39	0.00	0.00	0.32	2.56	0.26	2.04	1.44	11.40	Consider site layout and design	Recommendation C	Parts of the defined area are currently in FZ3a. Also, the flood risk in parts of this area which are currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change. CDC data suggests local flood risk along A6068 Colne Road adjacent to the site.
SG064	Land south of Runley Bridge Farm and west of B6480, Settle	Employment	5.04	5.04	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	7.29	0.08	1.61	0.19	3.79	Development could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK049	Land east of Skipton Bypass, Skipton	Mixed Use	23.48	7.91	33.68	8.27	35.21	0.08	0.35	7.22	30.76	0.07	0.30	4.99	21.25	2.68	11.39	Consider withdrawal of Site	Recommendation A	A large portion of this area is within the Functional Floodplain (FZ3b). Further, the flood risk in parts of this area which are currently within FZ2 may increase to FZ3 magnitudes in future due to climate change. North-eastern tip and part of south-western edge overlap with historic flood map.
SK135	Skipton Rock Quarry, Harrogate Road, Skipton	Employment	4.61	4.61	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	4.01	0.11	2.29	0.37	7.99	Development could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SK113	Land between Skipton Auction Mart and canal, Skipton	Employment	3.84	3.44	89.66	0.01	0.20	0.39	10.14	0.00	0.00	0.30	7.75	0.05	1.42	0.11	2.83	Development could be permitted subject to FRA	Recommendation D	Parts of the defined area are currently in FZ3a, but this is acceptable for Employment sites. Note that the flood risk in parts of this area which are currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.
SK049 (Employment Only)	Land east of Skipton Bypass, Skipton	Employment	5.65	1.95	37.93	3.57	69.06	0.06	0.93	0.10	2.01	0.00	0.06	0.07	0.45	0.53	6.76	Consider site layout and design	Recommendation C	Limited parts of the defined area are currently in FZ3b. Also the flood risk in parts of this area which are currently within FZ2 could potentially increase to FZ3 magnitudes in future due to climate change.

Craven District Council

Local Plan Potential Development Sites Assessment

Employment Sites

27 January 2017

Summary Table

			Flood Zone Coverage								Risk of Flooding from Surface Water					
			Flood Zone 1		Flood Zone 2		Flood Zone 3a		Flood Zone 3b (2016 SFRA)		1 in 30 year		1 in 100 year		1 in 1000 year	
Proposed Use	Number of Sites	Area (ha)	Area (ha)	No. 100%	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.
Employment	5	14.71	14.71	5	0.00	0	0.00	0	0.00	0	3.31	2	1.02	2	1.58	3
Mixed Use	2	14.31	14.31	2	0.00	0	0.00	0	0.00	0	2.98	2	2.01	2	3.03	2
TOTAL	7	29	29	7	0	0	0	0	0	0	6	4	3	4	6	5

Main Table

				Flood Zone Coverage								Risk of Flooding from Surface Water								
				Flood Zone 1		Flood Zone 2		Flood Zone 3a		Flood Zone 3b (2016 SFRA)		1 in 30 year		1 in 100 year		1 in 1000 year				
Site Reference	Site Name	Proposed Use	Area (ha)	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Development Viability	Strategic Recommendation (see Report)	Additional Comments
SG025	Land to the south of Ingfield Lane, Settle	Mixed Use	10.27	10.27	100.00	0.00	0.00	0.00	0.00	0.00	0.00	2.60	25.28	1.93	18.75	3.74	36.39	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but note potential significant risk from surface water flooding needs to be evaluated in FRA.
SG063	Land east of Rurley Bridge Farm and B6480, Settle	Employment	1.39	1.39	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG064	Land adjacent to B6480, Settle	Mixed Use	5.04	5.04	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	7.28	0.08	1.61	0.19	3.79	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG067	Land to south east of Rurley Bridge Farm, B6480, Settle	Employment	1.99	1.99	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.
SG083	Land at the corner of the A65 and Brackenber Lane, Giggleswick	Employment	6.29	6.29	100.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07	16.95	0.70	11.13	1.32	21.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but note potential significant risk from surface water flooding needs to be evaluated in FRA.
SG084	Land to east of A65 and north of Gildersleets, Giggleswick	Employment	3.09	3.09	100.00	0.00	0.00	0.00	0.00	0.00	0.00	2.24	72.49	0.32	10.49	0.26	8.25	Consider withdrawal of Site	Recommendation A	A large portion of this site is at high risk of surface water flooding. Mitigation of this risk on site is unlikely to be achievable.
SK080	Land north of Skipton Auction Mart, Skipton	Employment	1.65	1.65	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Could be permitted subject to FRA	Recommendation D	Entirely in FZ1, but site extent exceeds 1Ha.

B SFRA Maps

Interactive GeoPDF Maps

The starting point for viewing the interactive maps is the Overview Map. This should be opened in Adobe Acrobat (2016s4408_Craven_SFRA_Overview.pdf). It contains several index squares covering the district. When an index square is clicked, a hyperlink is activated and an Index Map for that area opens up.

Each Index Map contains a further set of index squares covering different areas of the district. Clicking on one of these index squares will open up a more detailed map of that area, at a scale of 1:10,000, by way of a hyperlink.

Within the detailed maps, there are tools allowing the user to zoom in or out and the hand tool can be used to move around the map. In the legend on the right-hand side of the detailed maps, there is a dropdown list which enables the user to select the group of layers which is displayed. The preferred development site reference labels can also be switched on and off if, for example, smaller sites are obscured by the labels.

C Functional Floodplain Delineation

Technical note explaining the methodology behind the delineation of the current functional floodplain (Flood Zone 3b) for this SFRA.

NOTE TO FILE

JBA Project Code	2016s4408
Contract	Craven DC SFRA - Level 1 Update
Client	Craven District Council
Day, Date and Time	31 October 2016
Author	Jacqueline Wallace
Subject	Functional Floodplain Note

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, as indicated in the table below, 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.

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% annual exceedance probability) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme flood (0.1% annual exceedance probability), should provide a starting point for consideration and discussions to identify the functional floodplain. Generally, development should be directed away from these areas.

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 Functional Floodplain Delineation

2.1 Available Data

The following datasets were available for use in delineating the current functional floodplain for the Craven district:

Supplied by the Environment Agency

- 2006 Lune 2 tributaries flood risk mapping study
- 2006 Settle and Low Moor flood mapping study
- 2008 Ingleton Jenkin JFlow study
- 2009 Wigglesworth JFlow study
- 2011 Clapham Beck flood risk mapping study
- 2013 Hellifield Beck flood mapping study
- 2014 Skipton FAS pre-scheme interim deliverables

Open Data obtained from data.gov.uk

- Flood Storage Areas (FSA)
- Historic Flood Map (HFM)
- Areas Benefitting from Defences (ABD)

Supplied by CDC

- OS Vector Map (1 to 10,000 scale)

2.2 GIS methodology for deriving the current functional floodplain

- A GIS file containing the previous functional floodplain for the Craven district was used as a baseline for the current FZ3b layer *(FZ3b_2009_DRAFT_v2_CR.shp)*.

  The functional floodplain delineated for the previous SFRA in 2010 used flood extents derived from the following modelling studies:

  - 2000 Eller Beck Section 105 studies
  - 2006 Lune 2 Tributaries Flood Risk Mapping Study
  - 2006 Settle and Low Moor Flood Mapping Study
  - 2008 Upper Aire Strategy (an update of the 2005 study)
  - 2008 Glusburn Beck SFRM

- Modelled flood outlines from relevant studies covering the Craven district were consulted and incorporated into the current functional floodplain if applicable *(2016s4408_Craven_FZ3b_2016_DRAFT_v1.shp)*.

  Where modelled flood outlines were supplied for studies undertaken before 2010, the previous functional floodplain layer was checked to ensure the model outlines had been incorporated. For Environment Agency modelling studies undertaken since the previous SFRA was completed in 2010, modelled flood outlines were incorporated into the current functional floodplain layer where suitable outlines were available. These studies were:

  - 2011 Clapham Beck SFRM – 20-year undefended outline
  - 2013 Hellifield Beck – 25-year defended outline

  Final modelled flood outlines from the Skipton Flood Alleviation Scheme study are not yet available. Therefore, the current FZ3b shapefile does not include updated outlines for Skipton, or areas designated for flood storage as part of the Skipton FAS. It is recommended that the FZ3b is reviewed once outputs from the Skipton FAS are available.

- The Environment Agency Flood Storage Areas (FSA) GIS file was checked and found to be a little more extensive than the FZ3b in some places along the Aire Valley. The FSA was therefore incorporated into the current FZ3b. *(Craven_FZ3b_2016_DRAFT_v2.shp)*
- The Environment Agency Historic Flood Map (HFM) GIS file was found to be a little more extensive in the River Aire valley than the previous functional floodplain (which was based on the Upper Aire Strategy (2005/2008). *(Craven_FZ3b_2016_DRAFT_v3.shp)*. The HFM was not incorporated into the current FZ3b in Hellifield as there has been a recent modelling study completed here.
- The Environment Agency Areas Benefitting from Defences (ABD) GIS file was compared to the recent modelling study ABDs and defended model outlines, and was found to be up-to-date. Any areas of FZ3b which coincided with ABDs were removed *(Craven_FZ3b_2016_DRAFT_v4.shp)*.
- Any FZ3b within the Yorkshire Dales National Park area was removed *(Craven_FZ3b_2016_DRAFT_v5.shp)*.
- 'Built up' areas were determined using the 1:10,00 scale mapping background data. FZ3b was removed where it coincided with built up/urban areas and infrastructure *(Craven_FZ3b_2016_DRAFT_v6.shp)*.
- The functional floodplain layer was trimmed to incorporate the Environment Agency HFM data only up to the limits of the current Environment Agency Flood Map for Planning Flood Zone 3 extent *(Craven_FZ3b_2016_DRAFT_v8.shp)*.
- The areas in the final draft current FZ3b GIS file were then removed from FZ3 to derive FZ3a.

3 Considerations for the LPA, Environment Agency and LLFA

- The attributes of the functional floodplain GIS file provide the source of the polygons which make up the functional floodplain.
- The 1:10,000 map background has been used to delineate urban areas for removing from the FZ3b. If there are any further built up areas which should be excluded based on local knowledge, the FZ3b should be updated.
- The modelled flood outline for Clapham Beck incorporated into FZ3b is undefended. Defences are not thought to be present in Clapham. If defences are present, then the FZ3b should be updated.
- The current FZ3b does not include the recent modelling outlines provided as interim deliverables for the Skipton Flood Alleviation Scheme (FAS) study. Outlines were not available for a suitable return period and scenario for inclusion in the FZ3b. Details of the flood storage areas being installed as part of the FAS are not available. Fluvial modelling will be undertaken once the scheme is built. The areas designated as flood storage as part of the FAS should be included in the functional floodplain, to ensure they are protected from development in the future. **Once the FAS final model outputs are available, a review of the functional floodplain is recommended, to provide an understanding of the expected change in flood risk to Skipton and the impact on the pool of preferred development sites.**

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