

South East Lincolnshire Strategic Flood Risk Assessment March 2017



South East Lincolnshire
Joint Strategic Planning Committee

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1.1. Introduction

- 1.1.1 The South East Lincolnshire Joint Planning Unit (SELJPU) area lies to the west and south-west of the Wash estuary. The low-lying nature of the area makes it vulnerable to flooding from both rivers and the sea. The main watercourses, such as the River Witham, River Welland, River Nene and connected drainage channels have tidal influences. The area is protected from flooding by an extensive network of raised engineered defences, which provide varying standards of defence. Climate change, particularly associated with the predicted effects on sea level rise, brings an increased likelihood of flooding that could be a danger to life affecting whole settlements. Such an extreme consequence would come about as a result of the highest tides (predicted to be common in 100 years time) coupled with storm surge conditions causing major breaches in coastal/tidal defences. Even a minor flood event has the potential to inundate valuable farmland with saline water and impact productivity for many years.
- 1.1.2 The Environment Agency's Flood Map shows that almost the whole of the Borough of Boston and a large part of the South Holland District are at a high probability of flooding. Approx 85% of Boston lies within the floodplain (84% in Flood Zone 3 'high probability', 1% in Flood Zone 2 'medium probability') resulting in 26,503 residential and 1,212 commercial properties being at risk. Approximately 74% of South Holland lies within the floodplain (68% in Flood Zone 3, 6% in Flood Zone 2) resulting in 29,922 residential and 1,296 commercial properties being at risk.

1.2. National Planning Requirements

- 1.2.1 Government guidance, contained in the [National Planning Policy Framework](#) (NPPF) and the [National Planning Practice Guidance](#) (NPPG) advises that a Strategic Flood Risk Assessment (SFRA) should be carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future, taking account of the impacts of climate change, and to assess the impact that land use changes and development in the area will have on flood risk.

1.3. South East Lincolnshire SFRA

- 1.3.1 This report contains the SFRA carried out by the South East Lincolnshire Joint Planning Unit (SELJPU). It is accompanied by mapping which shows the variation in flood risk for land within the SELJPU area.
- 1.3.2 The assessment has been undertaken to ensure there is consistent evidence base against which the SELJPU can inform its Local Plan and Development Management decisions.
- 1.3.3 The previous Boston Borough Council SFRA was completed in October 2010. South Holland District Council's SFRA was completed in January 2010.
- 1.3.4 This report supersedes these existing documents and provides the latest and best available information on flood risk.
- 1.3.5 The report contains information to cover the two levels of assessment recommended by the National Planning Practice Guidance (NPPG), i.e. Level 1 and Level 2 assessments.
- 1.3.6 The Level 1 assessment is present in the form of the Environment Agency's Flood Map, Flood Map for Surface Water and Reservoir Flood Map. These maps identify the potential extent of flooding from tidal, fluvial, surface water and reservoirs (further detail on these maps is contained in the relevant sections below).
- 1.3.7 The Level 2 assessment is present in the form of hazard mapping, which classifies flood risk as Low Hazard and Danger to Some/Most/All based upon the modelling of factors including

the potential depths of flooding, the velocity of flood flows and the presence of water borne debris.

- 1.3.8 The hazard mapping covers the whole of the Boston Borough Council area (please note that the component maps for the hazard in Boston, i.e. depth and velocity, are only available for those areas where tidal risk is dominant). In the South Holland area, the hazard map covers Spalding, Pinchbeck, Surfleet, Crowland and Sutton Bridge.
- 1.3.9 Development in areas beyond the Level 2 SFRA boundaries (and the fluviially dominant areas of Boston) and within a Flood Zone will need to undertake their own assessment, relative to the scale and nature of the proposed development, to inform appropriate mitigation consistent with the appended Standing Advice.
- 1.3.10 This document has been prepared in consultation with the Environment Agency, and Lincolnshire County Council in its role as Lead Local Flood Authority. It brings together information from these organisations, as well as the Internal Drainage Boards.
- 1.3.11 The Local Authorities and the Environment Agency have agreed a framework of flood risk mitigation requirements for development proposals according to different levels of risk (standing advice - see section 10 below). This sets a level of safety over the lifetime of the development where development in areas at risk is deemed appropriate and necessary to meet local need. The Local Authorities will use the relevant parts of the standing advice to ensure a consistent approach to flood mitigation is applied and to ensure development in high hazard areas is made safe as required by the NPPF. The standing advice also gives a clear indication of where mitigation will need to be incorporated into development proposals, which will enable developers to design in these elements and include in any viability appraisal from the outset.

1.4. Guidance on using this SFRA

- 1.4.1 The information within this SFRA is being used to refine information on river and sea flooding shown on the Environment Agency's [Flood Map for Planning](#). The information is being used by the SELJPU to:
- Determine the variations in risk from all sources of flooding;
 - Inform the Sustainability Appraisal of the Local Plan so that flood risk can be fully taken into account when considering allocation options and in the preparation of plan policies;
 - Apply the Sequential Test, and where necessary, the Exception Test when determining land use allocations;
 - Assist with site-specific flood risk assessments;
 - Determine the acceptability of flood risk in relation to emergency planning capability; and
 - Consider opportunities to reduce flood risk to existing communities and development through better management of surface water, provision for conveyance and of storage of flood water.
- 1.4.2 The SFRA is divided into sections, which contain a variety of information such as flood maps, guidance and advice. Please note that this SFRA does not seek to duplicate advice and guidance already contained in other planning documents. Therefore, it should be read in conjunction with government guidance on flood risk, currently contained in the [NPPF](#) and the [NPPG](#).

2. Flood Map for Planning (Rivers and Sea)

- 2.1.1 The Environment Agency's [Flood Map for Planning](#) shows areas across England that could be affected by flooding from rivers or the sea in the current day. It also shows flood

defences and the areas that benefit from them. The Flood Map is available online from the Environment Agency's web site, and it has been designed to raise awareness among the public, local authorities and other organisations of the likelihood of flooding. It aims to encourage people living and working in areas prone to flooding to find out more and take appropriate action.

- 2.1.2 The Flood Map shows the extent of Flood Zones, areas also known as flood plains, which could be affected by flooding from rivers and the sea.
- 2.1.3 These Flood Zones are defined in the Government's NPPG. They ignore the presence of existing flood defences, since defences can be 'overtopped' if a flood occurs which is higher than the defences are designed to withstand. Defences can even fail in extreme events.
- 2.1.4 Flood Zone 1 shows areas with the lowest probability of flooding from rivers and the sea, where the chance of flooding in any one year is less than 0.1% (i.e. 1 in 1000).
- 2.1.5 Flood Zone 2 shows the area between Zone 1 and Zone 3. This represents an area with the chance of flooding in any one year between 0.1% and 1% fluvial or 0.5% tidal (i.e. between a 1 in 1000 and either a 1 in 100 fluvial or a 1 in 200 tidal chance). The outer edge of this zone is referred to as the 'Extreme Flood Outline' (EFO).
- 2.1.6 Flood Zone 3 shows areas with the highest probability of flooding. The chance of flooding in any one year is greater than or equal to 1% (i.e. a 1 in 100 chance) for river flooding and greater or equal to 0.5% (i.e. a 1 in 200 chance) for coastal and tidal flooding.
- 2.1.7 The Environment Agency Flood Map should be used by Local Planning Authorities to inform planning decisions, and the Flood Zones are the starting point for applying the Sequential Test. For further information, please refer to Chapter 8 of this SFRA.
- 2.1.8 Flood Zones are also used to identify when a developer needs to carry out a Flood Risk Assessment.
- 2.1.9 A Flood Risk Assessment or Flood Risk Statement may also be required for development at risk of flooding from local sources of flooding. This is discussed in further detail in Section 5 on Local Sources of Flooding.

3. Fluvial and Tidal Hazard Mapping

- 3.1.1 This SFRA contains hazard mapping for the parts of the South East Lincolnshire study area, which incorporates both Fluvial and Tidal flood events for Boston, Spalding, Sutton Bridge, Pinchbeck, Crowland and Surfleet (see Appendix A).
- 3.1.2 The hazard mapping includes modelled flooding consequences resulting from both overtopping and breaching of flood defences.
- 3.1.3 The failure (or breaching) of flood defences is likely to cause rapid inundation of areas behind flood defences as flow in the river channel or from the sea discharges through the breach. A breach can happen with little or no warning, although they are much more likely to occur when there are extreme tides or river levels and the stresses on flood defences are highest. Flood water flowing through a breach will normally discharge at a high velocity, rapidly filling up the areas behind the defences, resulting in significant damage to buildings and a high risk of loss of life.
- 3.1.4 The crest (height) of the defences used in all modelling scenarios was based on present defence heights. Each breach was simulated individually. The width of the breach was dependent on the type and location of the defence.
- 3.1.5 The probability of a breach event is extremely difficult to determine, although overtopping will promote breaching. The modelling therefore only assesses the consequence of breaches; the assessment of the probability of a breach occurring is not required. Also, national planning guidance requires those proposing development in flood risk areas to ensure development and its future users are safe from the harmful effects of flooding therefore

appropriate mitigation against potential impacts will be required (i.e. the consequences of defence failure).

- 3.1.6 Overtopping of flood defences occurs when water levels exceed the height of the defence. The worst case occurs when the fluvial or tidal levels are above the defence level as this can lead to rapid inundation and prolonged flooding. Less severe overtopping can occur when flood levels are below defence levels, but wave action causes wave overtopping. Flood defences are commonly designed with a degree of freeboard to provide protection against overtopping from some waves.
- 3.1.7 Two scenarios were modelled: the 1 in 200 (0.5%) and 1 in 1000 (0.1%). This was undertaken for the 'present' day (2006 baseline) and 2115 (the year to which the final Defra sea level allowances related and allows for a lifetime of development).
- 3.1.8 The definition of flood hazard used in this hazard mapping follows the definition used by Defra and the Environment Agency which is translated in 'Flood Risk Assessment Guidance for New Development Phase 2, R&D Technical Report FD2320/TR2'. The classification is split into four categories, defined by the depth and velocity of flood waters and the related ability of people to evacuate the area once a flood occurs. Please refer to the table below for further information on flood hazard.

Table 13.1 Danger to people for different combinations of depth and velocity

Velocity (m/s)	Depth of flooding (m)											
	0.05	0.10	0.20	0.30	0.40	0.50	0.60	0.80	1.00	1.50	2.00	2.50
0.00				Yellow	Yellow	Yellow	Orange	Orange	Orange	Orange	Red	Red
0.10				Yellow	Yellow	Orange	Orange	Orange	Orange	Orange	Red	Red
0.25				Yellow	Orange	Orange	Orange	Orange	Orange	Red	Red	Red
0.50				Orange	Orange	Orange	Orange	Orange	Orange	Red	Red	Red
1.00			Yellow	Orange	Orange	Orange	Orange	Red	Red	Red	Red	Red
1.50			Yellow	Orange	Orange	Orange	Red	Red	Red	Red	Red	Red
2.00		Yellow	Yellow	Orange	Orange	Red	Red	Red	Red	Red	Red	Red
2.50		Yellow	Yellow	Orange	Red	Red	Red	Red	Red	Red	Red	Red
3.00		Yellow	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red
3.50		Yellow	Orange	Red	Red	Red	Red	Red	Red	Red	Red	Red
4.00		Yellow	Orange	Red	Red	Red	Red	Red	Red	Red	Red	Red
4.50	Yellow	Yellow	Orange	Red	Red	Red	Red	Red	Red	Red	Red	Red
5.00	Yellow	Yellow	Orange	Red	Red	Red	Red	Red	Red	Red	Red	Red

Key:

- Danger for some
- Danger for most
- Danger for all

(Source Table 13.1 of FD2320/TR2)

- 3.1.9 In addition to the areas of danger, there is also an area classified as low hazard (shown in green) on the hazard mapping. This area represents the outer extent of where flood water would reach during the breach or overtopping scenario, but should not pose a hazard to people. This represents the white boxes shown above in Table 13.1, where depths could be between 0.05m and 0.3m.

4. Fluvial and Tidal Depth Mapping

- 4.1.1 The hazard mapping shows the consequences should a breach or overtopping of existing defences occur. The results show the likely flood depths, velocities and overall hazard to a proposed site.
- 4.1.2 In particular, where hazard mapping indicates a proposed site will be inundated, the minimum finished floor levels of any development should be informed by the flood depth

maps arising from the applicable scenario (see Section 11 - Climate Change Allowances for Planning).

- 4.1.3 The Environment Agency and the Local Planning Authorities have agreed standing advice that applies to planning applications within the area covered by the Level 2 SFRA. This standing advice outlines how the flood depth maps (where available - see paragraph 1.3.8 above) should be used to inform adequate flood risk mitigation measures, along with further information on the correct scenarios to consider for each development type.
- 4.1.4 Please see Chapter 9 of this SFRA for further guidance on the Exception Test and flood risk mitigation requirements.
- 4.1.5 The Depth Maps can be found in Appendix B.

5. Local Sources of Flooding

5.1. General

- 5.1.1 The Environment Agency is responsible for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea.
- 5.1.2 Lead Local Flood Authorities are responsible for managing the risk of flooding from local sources: surface water, groundwater and ordinary watercourses. Local sources of flooding are considered in more detail in this Section.
- 5.1.3 Internal Drainage Boards are responsible for managing the risk of flooding within their Drainage Districts.

5.2. Surface Water Flooding

- 5.2.1 The NPPF requires that the risk from all sources of flooding is considered and that priority is given to the use of sustainable drainage systems. The NPPG advises that SFRAs should identify areas at risk from surface water flooding and drainage issues taking account of the surface water flood risk map published by the Environment Agency and any other available evidence, such as local flood risk management strategies. It should also identify the types of measures which may be appropriate to manage them, taking account of location, site opportunities, constraints and geology. Lead Local Flood Authorities provide expert advice to planning authorities on the management of surface water for planning.
- 5.2.2 The Environment Agency's [Flood Maps for Surface Water](#) give an indication of the broad areas likely to be at risk of surface water flooding. However, THEY ARE NOT SUITABLE FOR IDENTIFYING WHETHER AN INDIVIDUAL PROPERTY WILL FLOOD.
- 5.2.3 This is because the modelling only gives an indication of broad areas at risk, and because the Environment Agency does not hold information on floor levels, construction characteristics or designs of properties. It would need this and other detailed information to be able to say whether flooding of certain depth would enter into an individual property and cause damage.
- 5.2.4 These maps may be suitable for identifying where properties are in areas at risk of flooding for locations where surface water flooding is strongly influenced by topography.
- 5.2.5 In 2010 the Flood and Water Management Act defined 'surface runoff'.
- 5.2.6 Generally, the type of flooding shown by the Flood Map for Surface Water fits with the definition in the Act and shows:
 - The flooding that takes place from the 'surface runoff' generated by rainwater (including snow and other precipitation) which:
 - (a) is on the surface of the ground (whether or not it is moving), and
 - (b) has not yet entered a watercourse, drainage system or public sewer.

- 5.2.7 The Flood Map for Surface Water will pick out natural drainage channels, rivers, low areas in floodplains, and flow paths between buildings, but it will only indicate flooding caused by local rainfall.
- 5.2.8 It does not show flooding that occurs from overflowing watercourses, drainage systems or public sewers caused by catchment-wide rainfall events or river flow.
- 5.2.9 The Flood Map for Surface Water shows areas where surface water would be expected to flow or pond. There are four categories of risk:
- High - the chance of flooding in any year is greater than 3.3% (1 in 30);
 - Medium - the chance of flooding in any year is 3.3% (1 in 30) or less but greater than 1% (1 in 100);
 - Low - the chance of flooding each year is 1% (1 in 100) or less but greater than 0.1% (1 in 1000);
 - Very low - the chance of flooding each year is 0.1% (1 in 1000) or less.
- However, users must note that this is the chance of this rainfall, and not of the resulting flood extent occurring. Consequently, it only provides a general indication of areas which may be more likely to suffer from surface water flooding in these rainfall probabilities.
- 5.2.10 The Flood Map for Surface Water shows predictions of flooded areas but does not show whether individual properties will be affected by surface water flooding or have been affected in the past. The Flood Map for Surface Water should not be used to predict if individual properties will flood.
- 5.2.11 Developers are strongly advised to use local knowledge in conjunction with records held by Local Authorities and other partners (for example, of drainage systems and historic surface water flooding records) to assess and understand the suitability of the Flood Map for Surface Water as an indicator for surface water flooding in a proposed development area.
- 5.2.12 The Flood Map for Surface Water is available on the Environment Agency's [website](#)
- 5.2.13 A Flood Risk Assessment or Flood Risk Statement will be required in support of a planning application if a site lies within an area shown to be at risk of flooding on the Flood Map for Surface Water.

5.3. Groundwater Flooding

- 5.3.1 "Groundwater" means all water which is below the surface of the ground and in direct contact with the ground or subsoil. Periods of abnormally high rainfall can result in groundwater flooding of basements and the emergence of groundwater at the ground level, causing damage to property and infrastructure.
- 5.3.2 The British Geological Survey (BGS) have prepared a map showing the degree of susceptibility to groundwater flooding. The BGS should be contacted for more detailed site specific information on susceptibility to groundwater flooding whilst preparing a Flood Risk Assessment or Flood Risk Statement.
- 5.3.3 The Lead Local Flood Authority will need to be consulted on any proposed development in an area at risk of groundwater flooding.

5.4. Flooding from Other Local Sources

- 5.4.1 Flooding may also occur as a result of out of bank flows from ordinary watercourses. The flood risk from ordinary watercourses with a catchment greater than 3km² in Lincolnshire is identified on the Environment Agency's Flood Map for Planning. The flood extents shown on the flood map for planning are indicative only and may not represent the full extent of flooding. A site specific Flood Risk Assessment will therefore be required to assess the flood risk for any potential development site located in Flood Zones 2 or 3 of an ordinary watercourse.

- 5.4.2 In addition to the above requirement, the Lead Local Flood Authority will also require a site specific Flood Risk Assessment to be carried out if the site lies within 10m of an ordinary watercourse.

6. Functional Floodplain

- 6.1.1 The NPPG advises that Flood Zone 3b, Functional Floodplain, should be identified by Local Planning Authorities in Strategic Flood Risk Assessments.
- 6.1.2 Functional Floodplain should not be defined solely on rigid probability parameters. However, it is generally defined as land which would naturally flood with a 5% (1 in 20) chance in any one year or greater, or is designed to flood (such as a flood attenuation scheme).
- 6.1.3 Functional Floodplain is a very important planning tool in making space for flood waters when flooding occurs. The SELJPU's approach is to direct development away from these areas informed by the Environment Agency's flood risk management plans and shoreline management plans and local flood risk management strategies produced by Lincolnshire County Council (the Lead Local Flood Authority).
- 6.1.4 Within South Holland District, the functional floodplain comprises of the designated flood storage areas of the Crowland and Cowbit Washes and the Surfleet Reservoir (please also refer to section 7 below regarding reservoir flooding).
- 6.1.5 There is currently no Functional Floodplain in the Boston Borough.
- 6.1.6 The NPPG advises at [Table 3](#) that only [Water Compatible](#) development is appropriate in the Functional Floodplain.
- 6.1.7 Essential Infrastructure that has to be there and has passed the Exception Test may also be permitted providing it is designed and constructed to:
- remain operational and safe for users in times of flood;
 - result in no net loss of floodplain storage;
 - not impede water flows and not increase flood risk elsewhere.

7. Reservoir Flooding

- 7.1.1 The NPPG requires those proposing developments to assess the risk from all forms of flooding. The failure of a reservoir is one form of flooding that has the potential to cause catastrophic damage due to the sudden release of large volumes of water. The local planning authority has to evaluate the potential damage to buildings or loss of life in the event of dam failure, compared to other risks, when considering development downstream of a reservoir.
- 7.1.2 There are two flood storage reservoirs within the district of South Holland, namely Surfleet Reservoir, and the Crowland and Cowbit Washes. The latter is designated as a large raised reservoirs under the Reservoirs Act 1975.
- 7.1.3 The Reservoirs Act 1975 applies to all large raised reservoirs in England. Large raised reservoirs are those reservoirs capable of holding 25,000m³ or more of water above natural ground level.
- 7.1.4 The following sections provide some advice on what to consider in the two most common scenarios: development of a new reservoir and development downstream of or adjacent to an existing raised reservoir.

7.2. Development of a new reservoir

- 7.2.1 Anyone proposing the development of a new reservoir that will have an above ground capacity of 25,000m³ or more must consider the potential flood risk downstream of the new reservoir, in the event of dam failure leading to an uncontrolled release of water.

- 7.2.2 Developers will also need to provide the Environment Agency's Reservoir Safety Team with a notice of their intention under Section 21 of the Reservoirs Act, not less than 28 days before work on-site is due to start.
- 7.2.3 Applicants will also need to appoint a qualified civil engineer ('construction engineer') under Section 6 of the Reservoirs Act to design and supervise the construction work. Details of suitably qualified engineers can be found [here](#) It is recommended that developers complete a dam breach analysis and reservoir flood map, although this is not a requirement of the Reservoirs Act.

7.3. Development downstream of or adjacent to an existing reservoir

- 7.3.1 Reservoir flood maps for large raised reservoir can be found [here](#)
- 7.3.2 An assessment of the risk of inundation from the reservoir must be submitted in support of any planning application (this will normally include the need for breach analysis). This should include not only the risks posed to the development but also if the development within the reservoir's flood extent could change its risk designation to high-risk.
- 7.3.3 Given the potential legal and cost implications of development downstream of a 'not high-risk' reservoir, it is also recommended that applicants notify the reservoir owner of the planning application.

7.4. Surfleet Reservoir

- 7.4.1 The Surfleet Reservoir lies immediately upstream of the Surfleet outfall on the River Glen and is classified as Flood Zone 3b Functional Floodplain. This zone comprises land where water has to flow or be stored at times of flood. The reservoir contains approximately 50 properties, which were originally built as holiday chalets and intended for temporary occupancy only. Over the years these chalets changed hands, have been renovated and replaced, often with new owners being unaware of the risks involved. Many are now occupied all year round as permanent dwellings. Historic data records several flooding incidences, most recent events occurring in 1980, 2002, 2009 and January 2013.
- 7.4.2 National planning policy requires local planning authorities to adopt proactive strategies to mitigation and adapt to climate change, taking full account of flood risk. Where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term they should seek opportunities to facilitate the relocation of development, including housing, to more sustainable locations. Due to the increased likelihood of flood events occurring in this area and the need to protect property and life, it is a recommendation of this SFRA that further development in this location is not supported and opportunities to relocate existing properties outside of the functional floodplain are explored.

8. Sequential Test

- 8.1.1 The NPPF requires Local Plans to apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property. The Strategic Flood Risk Assessment provides the basis for applying this test. The general approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. The aim is to keep development out of medium and high flood risk areas (Flood Zones 2 and 3) and areas affected by other sources of flooding where possible.
- 8.1.2 The refined information in this SFRA (i.e. the hazard mapping) incorporates the consideration of climate change and should be used when carrying out a sequential assessment. Some areas that are shown not to be at risk in the undefended scenario (i.e.

the Flood Zones) may be at risk in the defended climate change scenario (i.e. the 2115 hazard mapping).

- 8.1.3 Where no reasonably available sites in Flood Zone 1 exist then Local Planning Authorities should consider the availability of sites in Flood Zone 2. Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3a be considered.
- 8.1.4 However, as mentioned in the Introduction above, the majority of the Boston Borough area and large parts of the South Holland district lie within Flood Zone 3. For this reason, and for the reason outlined in 8.1.2 above, it is therefore necessary to use the refined flood risk information (Hazard and Depth maps) to assist with the application of the Sequential Test.

8.2. Local Plan Sequential Test

- 8.2.1 The South East Lincolnshire Joint Planning Unit has used the mapping outputs contained in this Strategic Flood Risk Assessment to apply the Sequential Test.
- 8.2.2 The sites contained in the Strategic Housing Land Availability Assessment (SHLAA) for each settlement were assessed in terms of their suitability, availability and achievability to accommodate housing. Sites concluded to be developable and deliverable were then ordered in terms of which Flood Zone they were in.
- 8.2.3 As many of the settlements, and therefore potential housing sites, are entirely or largely within Flood Zone 3, it was necessary to then consider which flood hazard category they were in. The Breach Hazard Map for the 2115 scenario was used for this assessment (as the NPPG requires residential development lifetime to be considered for a minimum 100 years).
- 8.2.4 Where there were sites within a settlement in the same hazard category, it was necessary to use the information on flood depth (again in the 2115 breach scenario) to choose the most sequentially preferable. The Flood Zone, hazard and depth categories are recorded in the SHLAA.

8.3. Sequential Test for Planning Applications

- 8.3.1 The NPPF requires those proposing development in a location which is vulnerable to flood risk to present evidence to demonstrate that there are no other locations at a lower risk of flooding that could be suitable to accommodate the proposal. In line with this requirement, the Local Planning Authority will expect planning applications to be supported by evidence to demonstrate that the Sequential Test can be passed. Guidance on the application of the [Sequential Test](#) is available in the NPPF.
- 8.3.2 The NPPF advocates that the Sequential Test should be applied to all forms of development in medium and high risk areas (Flood Zones 2 or 3), other than sites which have been allocated in the Local Plan or for applications for minor development or change of use (except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site).
- 8.3.3 Minor Development is defined as:
- Minor non-residential extensions: Industrial/Commercial/Leisure etc. extensions with a footprint less than 250m² (where subsequent 250m² extensions are proposed a Sequential Test will be required).
 - Alterations: development that does not increase the size of buildings e.g. alterations to external appearance.
 - 'Householder' development: e.g. sheds, garages, games rooms etc. within the curtilage of the existing dwelling in addition to physical extensions to the existing dwelling itself. This definition EXCLUDES any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.

- 8.3.4 Subdivision of Dwellings: Although the subdivision of a house into flats is specifically excluded from the definition of minor development, where no significant external alterations are required, it would be viewed as a Change of Use application. Change of Use applications are excluded from the Sequential Test as clarified above. So, the conversion of a barn into a dwelling or the subdivision of a dwelling into two or more dwellings does not require a Sequential Test as long as it does not involve significant external alterations/extensions. Development Management officers will provide specific advice on whether or not a development falls within this category.
- 8.3.5 Replacement dwellings: Where an individual proposes to redevelop their property in an existing flood risk area the consideration of alternative sites is not likely to be a realistic option. In such instances, the Sequential Test should include a statement as to why there is no alternative available to them to develop. This simple statement will satisfy the Sequential Test provided that they:
- 1) Do not increase the number of bedrooms; and
 - 2) Do not increase the number of dwellings in an area of flood risk (i.e. through the replacement of a single dwelling with an apartment block); and
 - 3) Do not significantly increase the floor area of the building (i.e. beyond 40% of the original).
- 8.3.6 In order to carry out a Sequential Test it is necessary to define the geographical area in which a search for alternative sites at a lower risk of flooding will be undertaken. The search area for the test should be the whole of the Council area unless the functional requirements of the development justify a reduced search area. For example, if there is a need for a doctor's surgery to serve a particular catchment area then it may be appropriate to reduce the search area to that catchment. Equally, in some circumstances it may be appropriate to expand the search area beyond the district boundary. For example the location of an oil refinery serving the whole country should be determined on a countrywide basis. The Sequential Test evidence should define the search area and include a summary of the functional requirements of the development in justification of the area chosen. Housing developments will generally need to consider reasonably available alternative sites across the whole of the Council area unless they are intended to meet a specifically identified need e.g. the need for affordable housing in a particular settlement.
- 8.3.7 It is also necessary to identify the sources of reasonably available sites. This can be done through existing evidence basis such as the Local Plan, the SHLAA, the Employment Land Review and the Town Centre and Retail Capacity Study.
- 8.3.8 Reasonably available sites should NOT be discounted on the following grounds:-
- They are not owned by the developer.
 - They are larger than the proposed site (a series of smaller sites accommodating an equivalent quantum may also be considered);
 - They do not offer sustainability benefits equivalent to the proposed site;
 - They have an extant planning permission but development has not begun.
- 8.3.9 For the reasons outline in 8.1.2 and 8.1.4 above, the Flood Map will not provide information that is refined enough to carry out a meaningful Sequential Test due to the extent of Flood Zone 3 in this area. Therefore the hazard map and depth maps should be used (in that order) to refine the information on flood risk to the site and potential alternative sites.
- 8.3.10 Evidence should be presented to clearly show the name and location of the reasonably available site options being compared to the application site, together with the hazard and depth classification of the sites.
- 8.3.11 The evidence should include reasons as to why you may or may not conclude that the site is a reasonable alternative to the application site.
- 8.3.12 On receipt of this evidence it is for the Local Planning Authority, taking advice from the Environment Agency as appropriate, to consider whether or not the Sequential Test is passed.

- 8.3.13 In order to avoid unnecessary expense, it is strongly recommended that applicants discuss the likelihood of their proposal passing the Sequential Test with the Planning Authority's Development Management Team before formulating and submitting their application.

9. Exception Test

- 9.1.1 The Exception Test provides a method of managing flood risk for developments of certain flood risk vulnerability while still allowing necessary development to occur.
- 9.1.2 The Exception Test should be applied only after the Sequential Test has been undertaken and in the circumstances set out in Table 3 of the NPPG, i.e. when 'more vulnerable' development and 'essential infrastructure' cannot be located in Flood Zones 1 and 2 and when 'highly vulnerable' development cannot be located in Flood Zone 1.
- 9.1.3 Essentially, the two parts to the Test require proposed development to show that a) it will provide wider sustainability benefits to the community that outweigh flood risk, and b) that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall.
- 9.1.4 For Part a), consideration of the wider sustainability issues draws on the criteria for assessing the effects of the South East Lincolnshire Local Plan Documents (defined in the Sustainability Appraisal Scoping Report). This document provides the most localised criteria for considering wider sustainability issues within South East Lincolnshire and a useful template for considering each Strategic Site within 'Part a' of the Exception Test.
- 9.1.5 With particular reference to Part b), there are a range of factors to be considered when determining whether or not a development is 'safe'. However, the minimum mitigation measures required for each flood hazard zone can be found in the standing advice matrix at Appendix C.
- 9.1.6 All planning applications for development on windfall sites will need to meet the requirements of the Exception Test where applicable, and this should be demonstrated in a Site Specific Flood Risk Assessment.

10. Mitigation/Standing Advice

- 10.1.1 The Environment Agency and the Local Planning Authorities have produced local flood risk standing advice in the form of a matrix. This document has been prepared to assist in the interpretation of the Strategic Flood Risk Assessment for individual developments, whilst also providing pre-application advice. This matrix forms part of the Strategic Flood Risk Assessment and is contained in Appendix C.
- 10.1.2 Please note that single storey proposals will be expected to incorporate mitigation for the extreme 1 in 1000 (0.1%) scenario.
- 10.1.3 The Environment Agency has also produced basic guidance, aimed at developers and applicants on how to [complete](#) a Flood Risk Assessment.
- 10.1.4 Developers are also advised to refer to the DCLG document '[Improving the flood performance of new buildings: flood resilient construction](#)'. This document aims to provide guidance to developers and designers on how to improve the resilience of new properties in low or residual flood risk areas by the use of suitable materials and construction details. These approaches are appropriate for areas where the probability of flooding is low (e.g. Flood Zone 1) or areas where flood risk management or mitigation measures have been put in place.

11. Climate Change Allowances for Planning

- 11.1.1 The NPPF explains the key role of planning in ensuring new development is resilient to the impacts of climate change. Local Planning Authorities must adopt strategies to mitigate and adapt to climate change, taking full account of flood risk and coastal change. Local Plans need to take account of climate change over the longer term and for residential development this is considered to be a minimum of 100 years, unless there is specific justification for considering a short period.
- 11.1.2 The lifetime of a non-residential development depends on the characteristics of that development. Developers will be expected to justify why they have adopted a given lifetime for the development in their site-specific flood risk assessment. Generally commercial development is considered against 75 years, unless otherwise agreed with the planning authority. The adopted lifetime should be agreed with the relevant Development Management Case Officer.
- 11.1.3 The impact of climate change needs to be taken into account in a realistic way and developers, the Local Planning Authorities and the Environment Agency will need to agree what allowances are acceptable for particular proposals.
- 11.1.4 The Environment Agency has published guidance to assist with assessing the impacts of climate change in site-specific flood risk assessment. The guidance includes recommended contingency allowances for net sea level rise and peak rainfall intensity, peak river flow, offshore wind speed and wave height. Developers are requested to use this [guidance](#) when undertaking a site-specific flood risk assessment.
- 11.1.5 Please note when using this guidance, you will need to refer to the peak river flow allowances for the [Anglian River Basin District](#).

12. Site Specific Flood Risk Assessment

- 12.1.1 The NPPF requires that a site-specific Flood Risk Assessment (FRA) should accompany all planning applications for development proposals of 1 ha or greater in Flood Zone 1 and all proposals for new development located in Flood Zones 2 and 3.
- 12.1.2 The FRA should identify and assess the risks of all forms of flooding to and from the development and should demonstrate how these risks will be managed, taking climate change into account.
- 12.1.3 For major developments in all Flood Zones, the FRA should identify opportunities to reduce the probability and consequences of flooding.
- 12.1.4 A FRA will also be required where the proposals (including change of use to a more vulnerable flood risk vulnerability classification) may be affected by other sources of flooding or where the Environment Agency, Internal Drainage Board or other bodies have indicated there may be drainage problems.
- 12.1.5 Any Site Specific FRA will be expected to incorporate the relevant minimum mitigation measures found in the standing advice matrix.

13. Emergency Planning and Evacuation

13.1. Are flood warning and evacuation plans needed?

- 13.1.1 The National Planning Practice Guidance advises one of the considerations to ensure that any new development is safe, including where there is a residual risk of flooding, is whether adequate flood warnings would be available to people using the development. A flood warning and evacuation plan is a requirement for sites at risk of flooding used for holiday or

short-let caravans and camping and are important at any site that has transient occupants (e.g. hostels and hotels).

13.2. What are the important considerations for flood warning and evacuation plans?

- 13.2.1 The National Planning Practice Guidance advises flood warning and evacuation plans will need to take account of the likely impacts of climate change, e.g. increased water depths and the impact on how people can be evacuated. In consultation with the authority's emergency planning staff, the local planning authority will need to ensure that evacuation plans are suitable through appropriate planning conditions or planning agreements.
- 13.2.2 In advising the local planning authority, the emergency services are unlikely to regard developments that increase the scale of any rescue that might be required as being safe. Even with defences in place, if the probability of inundation is high, safe access and egress should be maintained for the lifetime of the development. The practicality of safe evacuation from an area will depend on:
- the type of flood risk present, and the extent to which advance warning can be given in a flood event;
 - the number of people that would require evacuation from the area potentially at risk;
 - the adequacy of both evacuation routes and identified places that people could be evacuated to (and taking into account the length of time that the evacuation may need to last), and;
 - sufficiently detailed and up to date evacuation plans being in place for the locality that address these and related issues.
- 13.2.3 Lincolnshire County Council has prepared an evacuation plan for East Coast Flooding which includes signed [evacuation routes](#).

13.3. Who should be consulted on emergency planning issues and in relation to reservoirs?

- 13.3.1 There are two flood storage reservoirs within the district of South Holland, namely Surfleet Reservoir, and the Crowland and Cowbit Washes. The latter is designated as large raised reservoirs under the Reservoirs Act 1975.
- 13.3.2 The National Planning Practice Guidance advises local planning authorities to consult with their emergency planning officers as early as possible during the preparation of Local Plans, and also regarding any planning applications which have implications for emergency planning. Where issues affecting emergency services are identified it may be relevant to contact the local resilience forum – multi-agency partnerships made up of representatives from local public services which prepare for local incidents and catastrophic emergencies. Or in some cases, it may be appropriate for the local planning authority to consult the emergency services on specific emergency planning issues related to new developments.
- 13.3.3 Local planning authorities are also advised to consult with the owners/operators of raised reservoirs, to establish constraints upon safe development.

14. Sustainable Drainage

- 14.1.1 Surface water flood risk on site should be managed using sustainable drainage systems such as swales, filter drains, bio retention basins, permeable paving, rain gardens, green roofs, etc. Sustainable drainage systems (SuDS) should be designed to control surface water runoff as close to where it falls as possible and mimic the natural catchment process. The design should aim to reduce runoff by integrating stormwater controls throughout the site in small discrete units rather than using large flow attenuation and flow control structures.

- 14.1.2 SuDS provide opportunities to:
- reduce surface water run-off;
 - encourage natural groundwater recharge;
 - reduce pollution;
 - enhance amenity and biodiversity.
- 14.1.3 The National Planning Practice Guidance requires sustainable drainage systems to be provided for all proposed [major development](#), unless demonstrated to be inappropriate, and states that priority must be given to the use of [sustainable drainage systems](#) in areas at risk of flooding. All developments, regardless of scale and constraints, should seek to incorporate sustainable drainage.
- 14.1.4 Good SuDS design involves:
- managing surface runoff at its source where it is reasonably practicable to do so;
 - managing surface runoff on the surface where it is reasonably practicable to do so;
 - using public space where it serves more than one property and is reasonably practicable to do so;
 - being cost-effective to operate and maintain over the life of the development;
 - taking account of the likely impacts of climate change and changes in impermeable area over the design life of the development where it is reasonably practicable to do so.
- 14.1.5 Generally, the aim should be to discharge surface water runoff as high up the following hierarchy of drainage options as reasonably practicable:
- into the ground (infiltration);
 - to a surface water body;
 - to a surface water sewer, highway drain, or another drainage system;
 - to a combined sewer.
- 14.1.6 SuDS design is an integrated process and must be considered early in the design process at the master planning stage. The runoff from properties and highways should be integrated and appropriate treatment stages applied. Flows should be managed in sequential sub-catchments (a management train) as close to the source as possible.
- 14.1.7 The minimum standards for SuDS are set out in the [non-statutory Technical Guidance for Sustainable Drainage Systems](#).
- 14.1.8 Surface water management schemes should be designed to provide multiple benefits, contributing to the enhanced amenity of developed areas, providing wildlife habitats and opportunities for biodiversity enhancement, as well as providing flood risk management function.
- 14.1.9 Clear arrangements must be in place for the on-going maintenance and/or adoption of the proposed drainage system for the lifetime of the development. These arrangements must be approved at the planning or reserved matters stage for all major development.

15. Appendices

- Appendix A: Fluvial and Tidal Hazard Mapping
- Appendix B: Fluvial and Tidal Depth Mapping
- Appendix C: Standing Advice