

Kings Lynn Level 2 SFRA

**Appendix C Guidance for Developers on
applying the Sequential and Exception Tests**

Flood data examples

March 2019

Contents



- Overview of Level 1 and Level 2 SFRA
- Sources of data to inform the developer guidance on the Sequential and Exception Tests (Appendix C to the Level 2 SFRA)

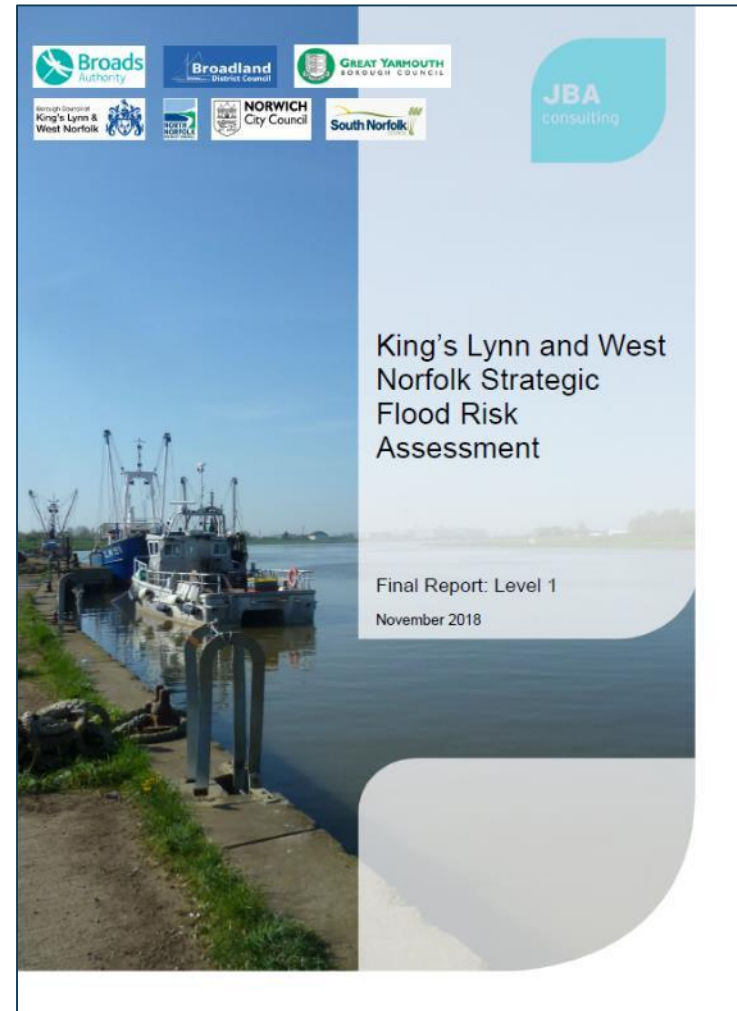
Reminder on use of SFRA data

- The SFRA is a strategic document and is not intended to replace the need for Developers to obtain detailed and site-specific flood risk information to inform Flood Risk Assessments.
- Rather it should be used to help apply the Sequential Test at an early stage and to scope and guide the contents of site specific Flood Risk Assessments and the Exception Test if it is required.

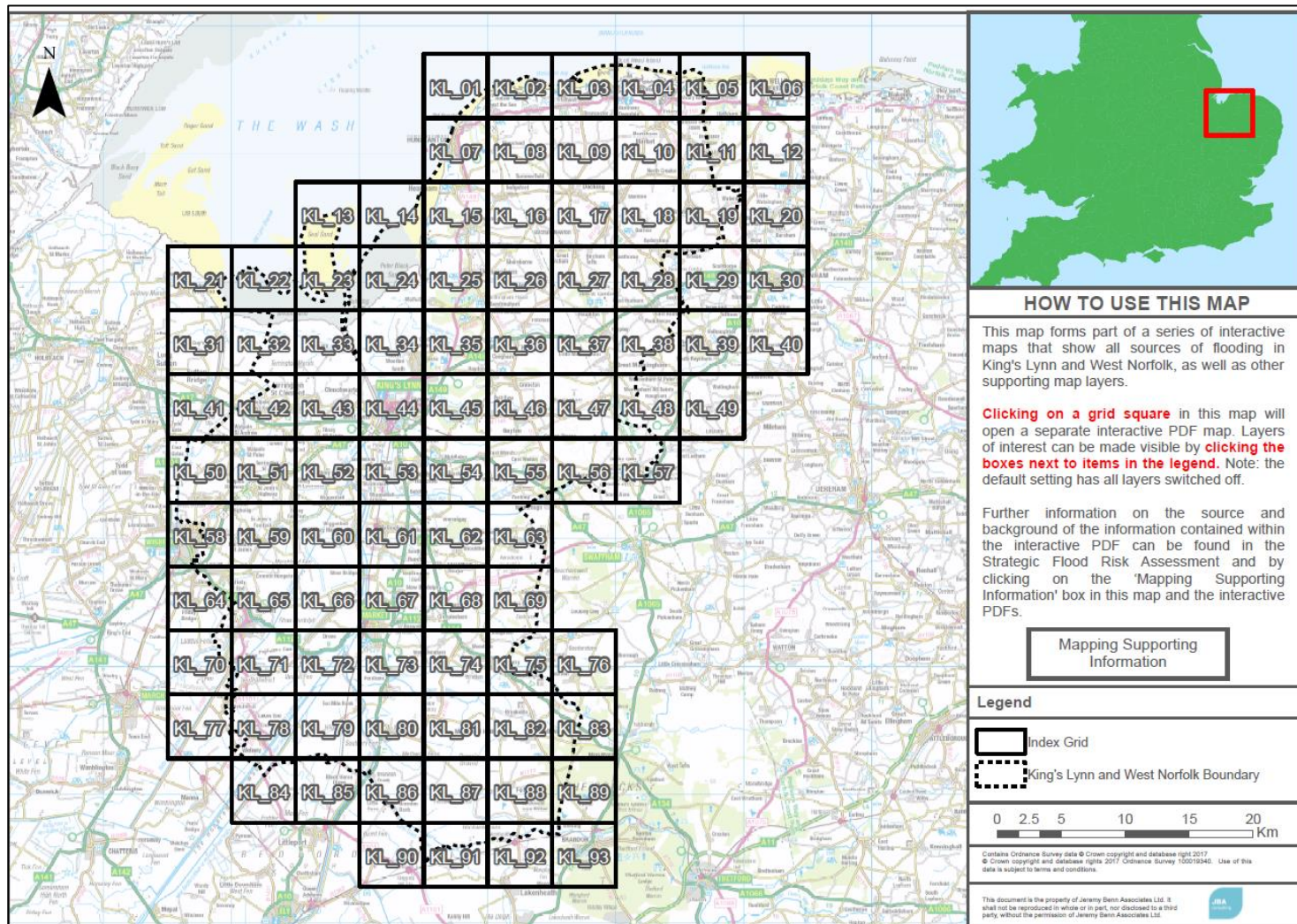
Overview of Level 1 and Level 2 SFRA

Level 1 SFRA

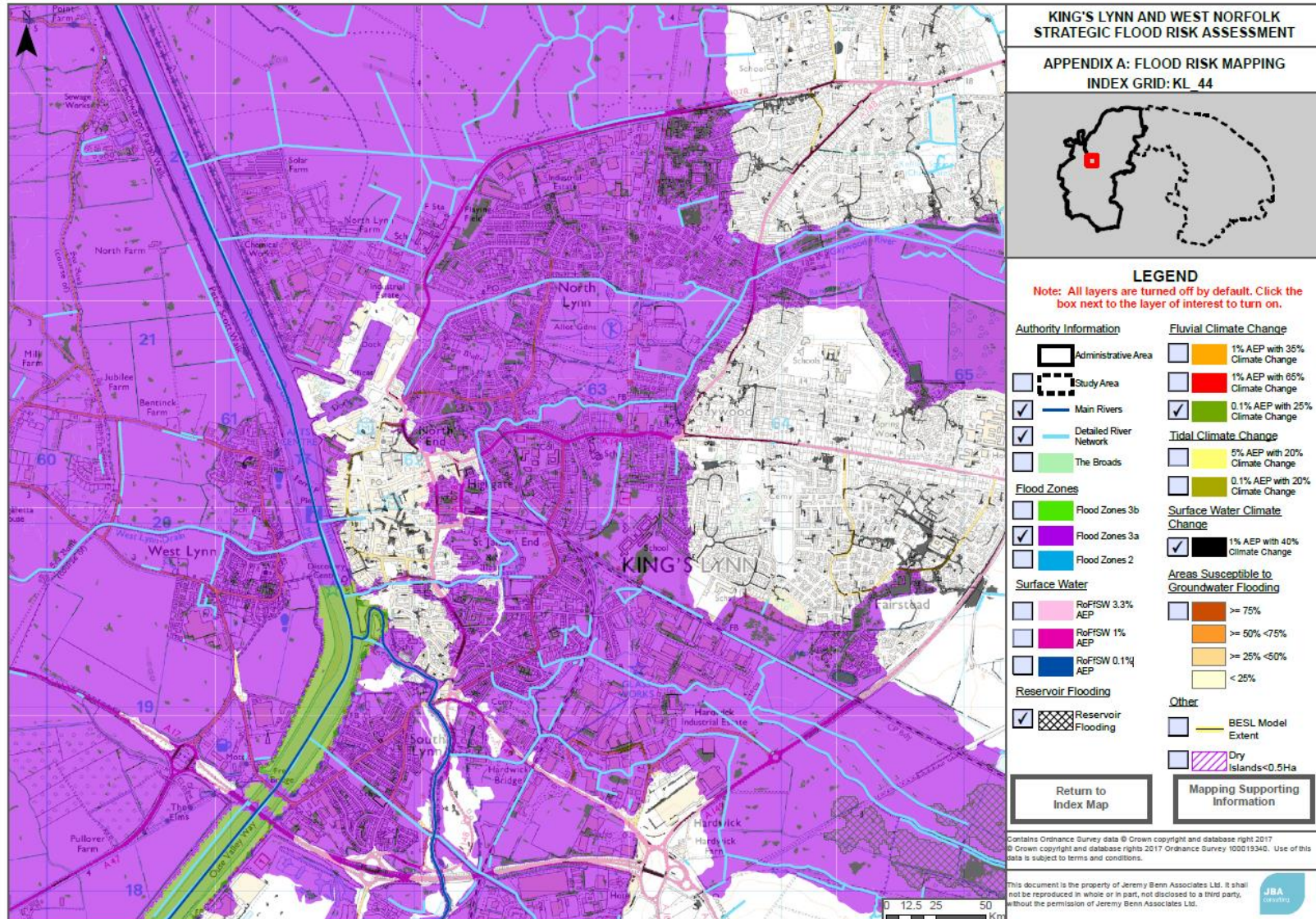
- Considers flood risk from all sources across the Council's area
- Updated climate change assessment
- Policy context
- FRAs guidance
- Surface water and SuDS
- Informs the Sequential Test



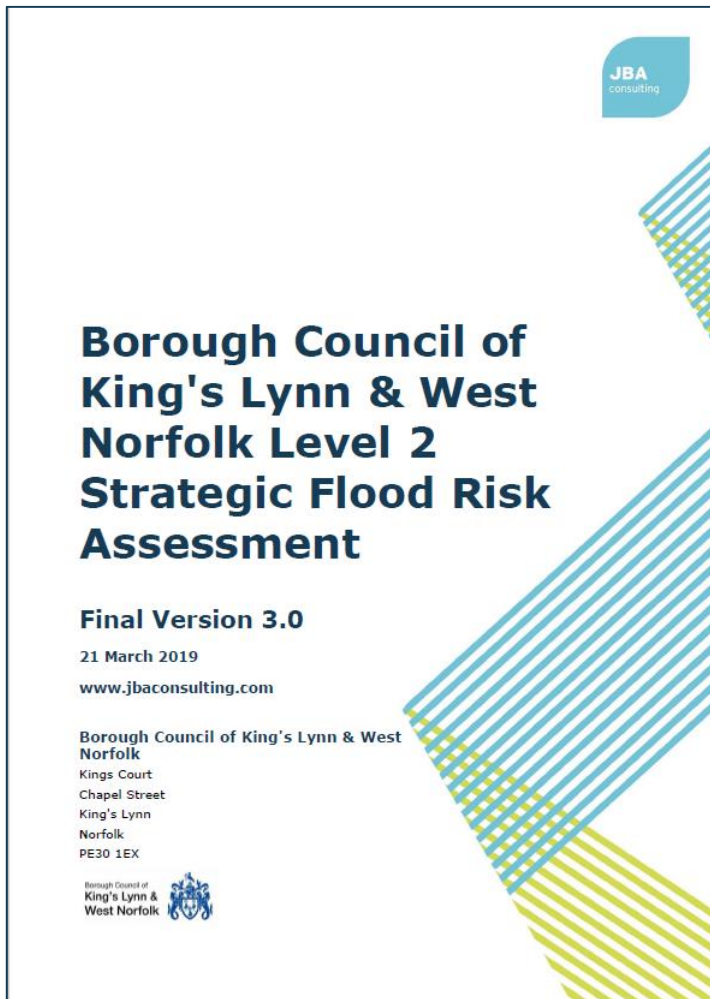
Mapping



Example Level 1 SFRA mapping



Level 2 SFRA



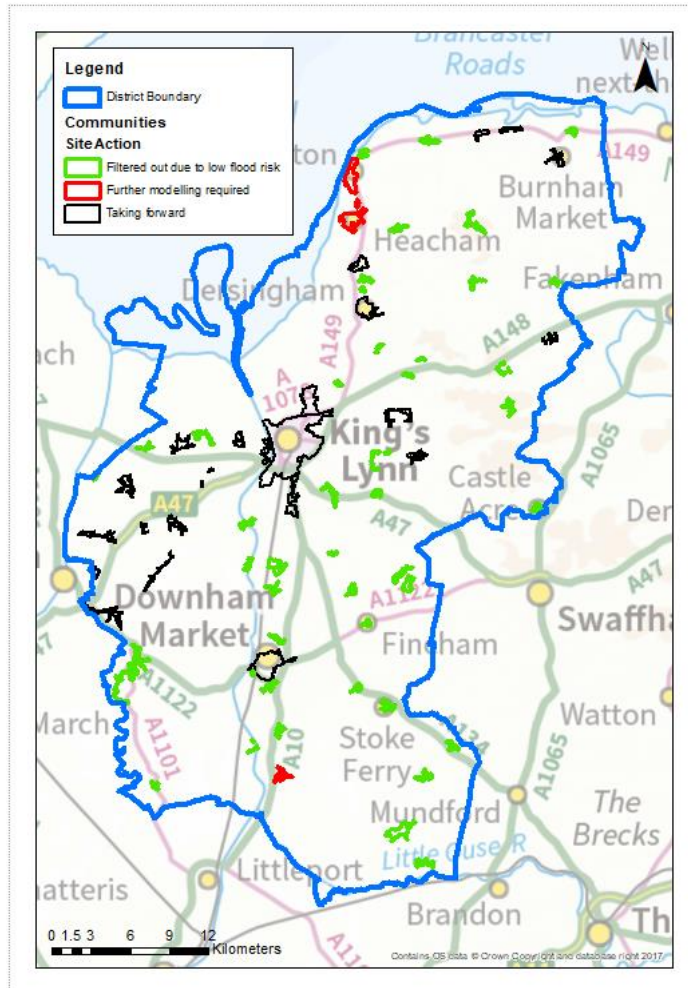
- Further ST guidance
- Further information at a Community level to inform LPA ET
- Identifies opportunities for wider FRM betterment
- Windfall sites ST and ET guidance

Community Level Assessment

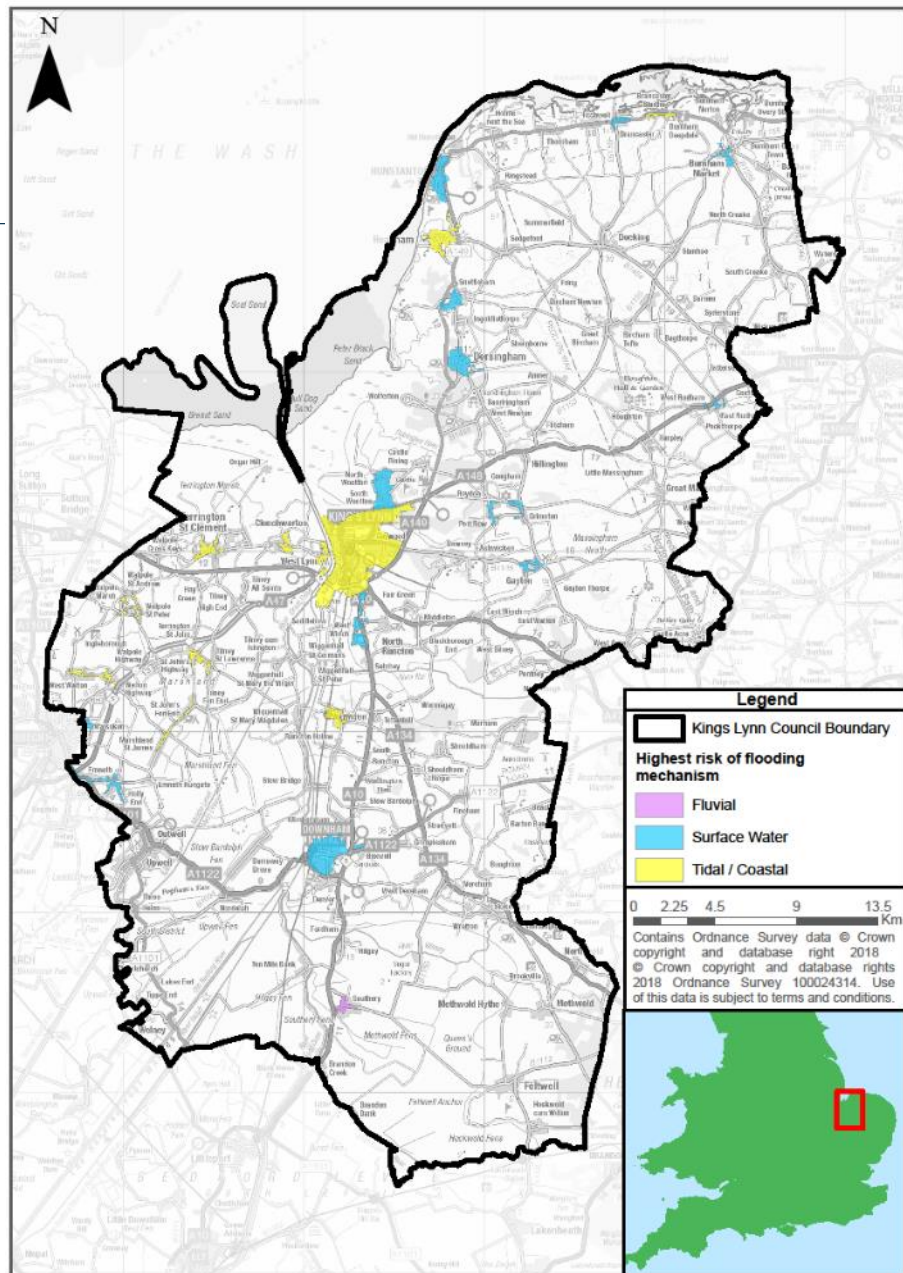
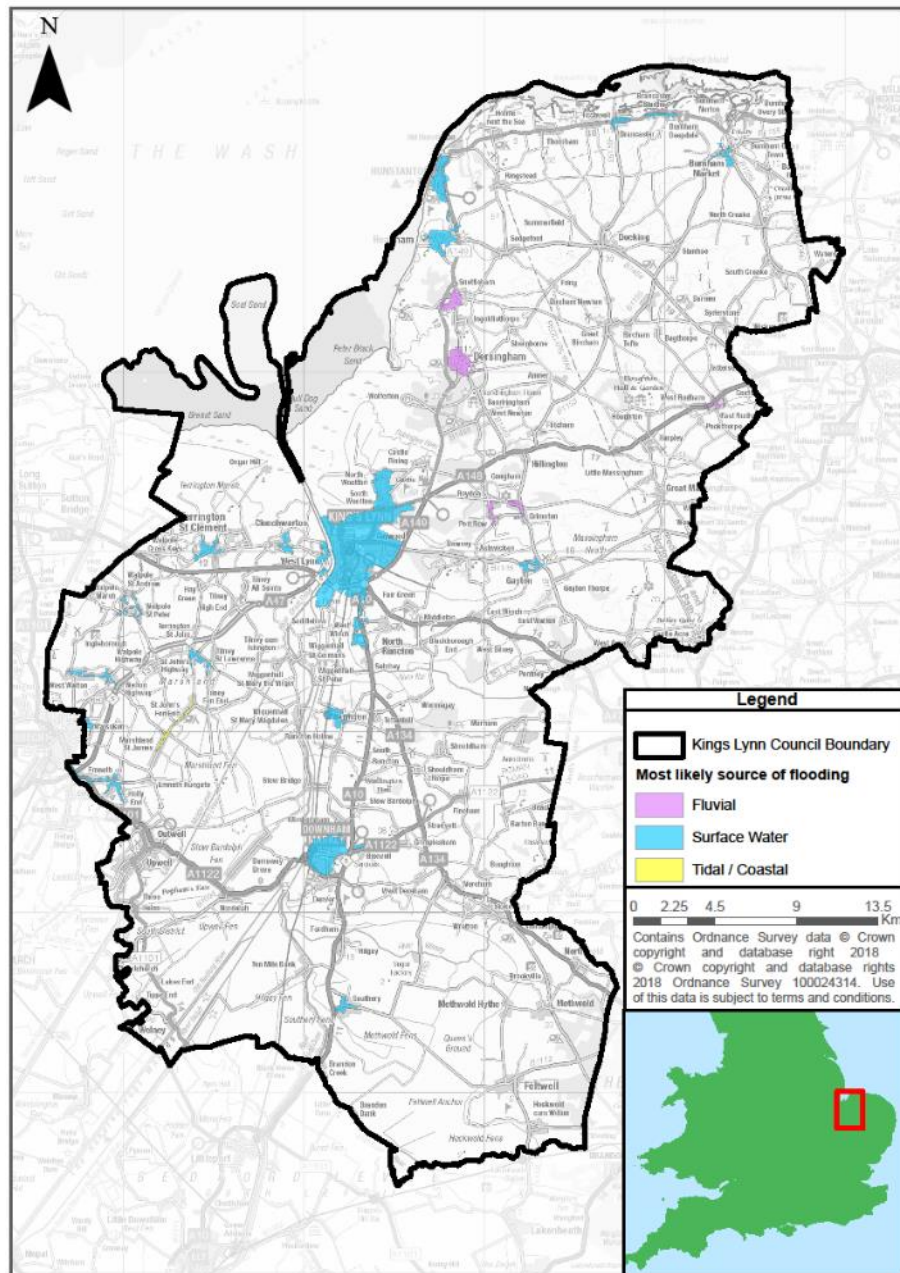


- A summary table and interactive map exist for each community
 - Highest risk and most likely source of flooding
 - Bring together flood risk information
 - Depth and hazard mapping
 - Identify Investment policy and needs
 - Consider Emergency Planning arrangements
 - Principles and guidance on the Exception Test
-

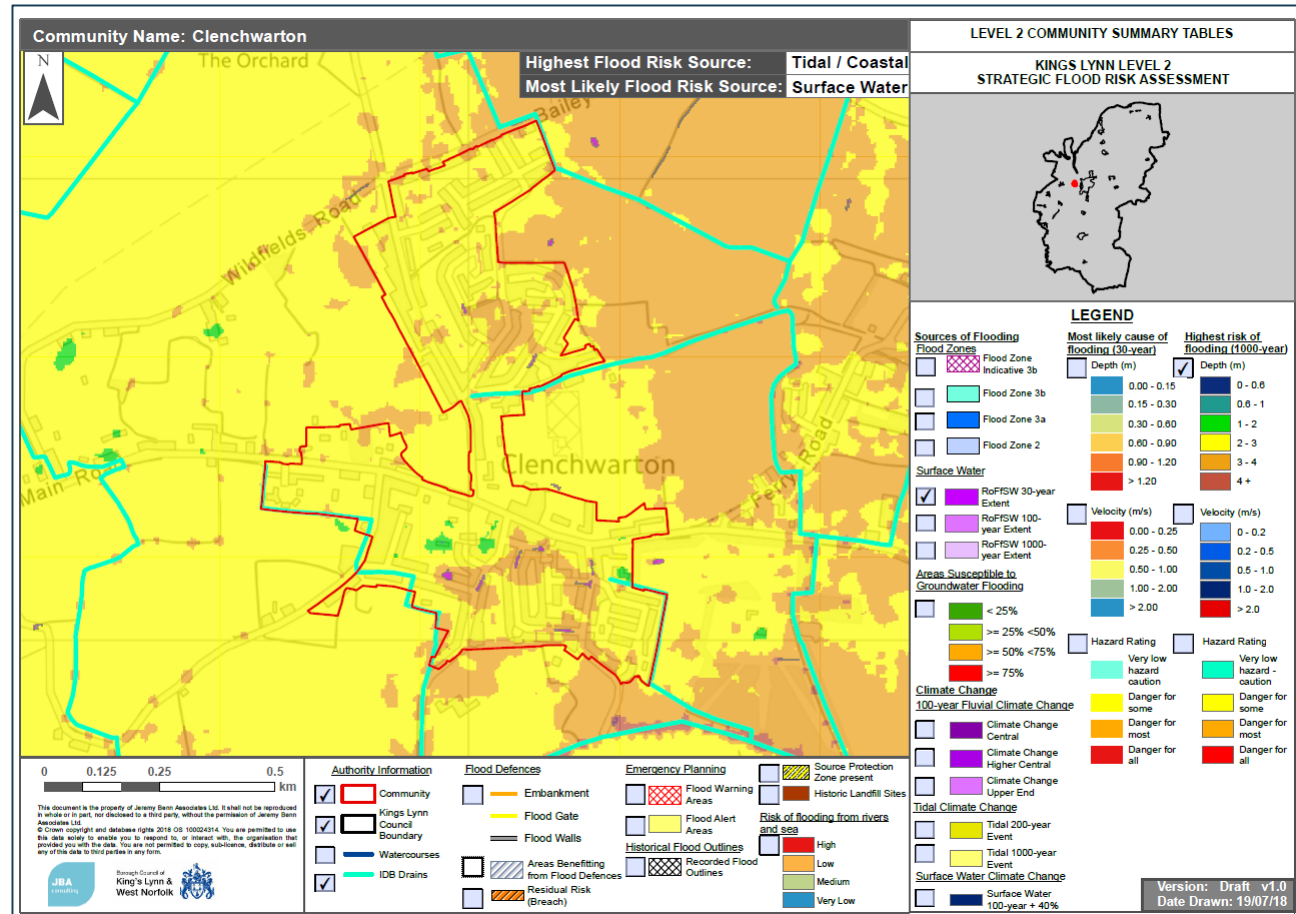
Community Area Assessments



- Brancaster with Brancaster Staithe / Burnham Deepdale
- Burnham Market
- Clenchwarton
- Dersingham
- Downham Market
- East Rudham
- Emneth
- Grimston, Pott Row with Gayton
- Heacham
- Hunstanton
- Kings Lynn including West Lynn
- Marshland St James & St John's Fen End with Tilney Fen End
- North Wootton & South Wootton
- Snettisham
- Southery
- St John's Highway/Tilney St Lawrence
- Terrington St Clement
- Walpole St Peter, St Andrew & Marsh
- Walsoken
- Watlington
- West Walton
- West Winch



Example Level 2 SFRA mapping

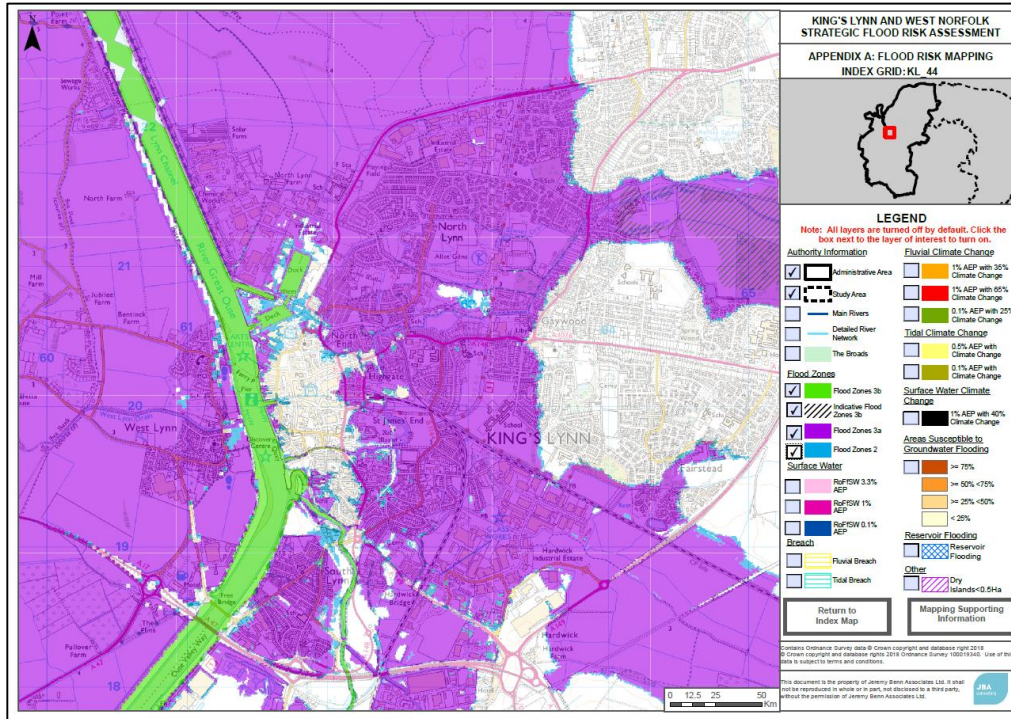


Examples to support developers to apply the guidance in Appendix C of the Level 2 SFRA



Flooding from rivers and sea

Flood map for planning



Flood Zone 2: undefended
extreme flood 1:1000
Flood Zone 3: tidal 1:200 and
river 1:100
Flood Zone 3b: functional
floodplain
Flood Zone 3a: remaining Flood
Zone 3
Flood Zone 1: everywhere else

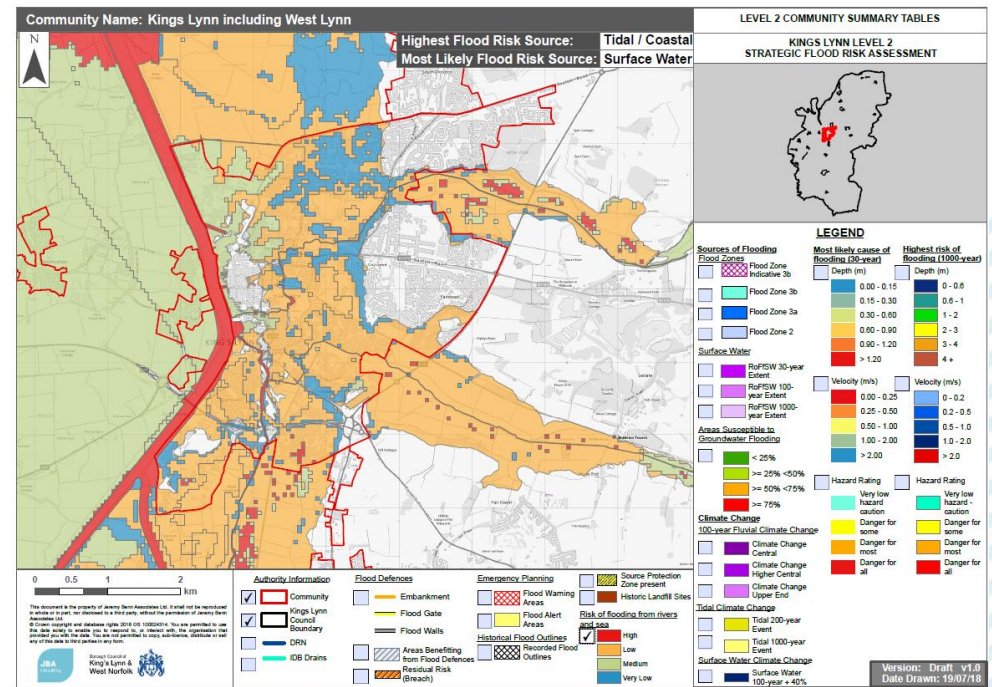
SFRA mapping may temporarily
be more up to date than gov.uk

3b only available via SFRA

<https://flood-map-for-planning.service.gov.uk/>

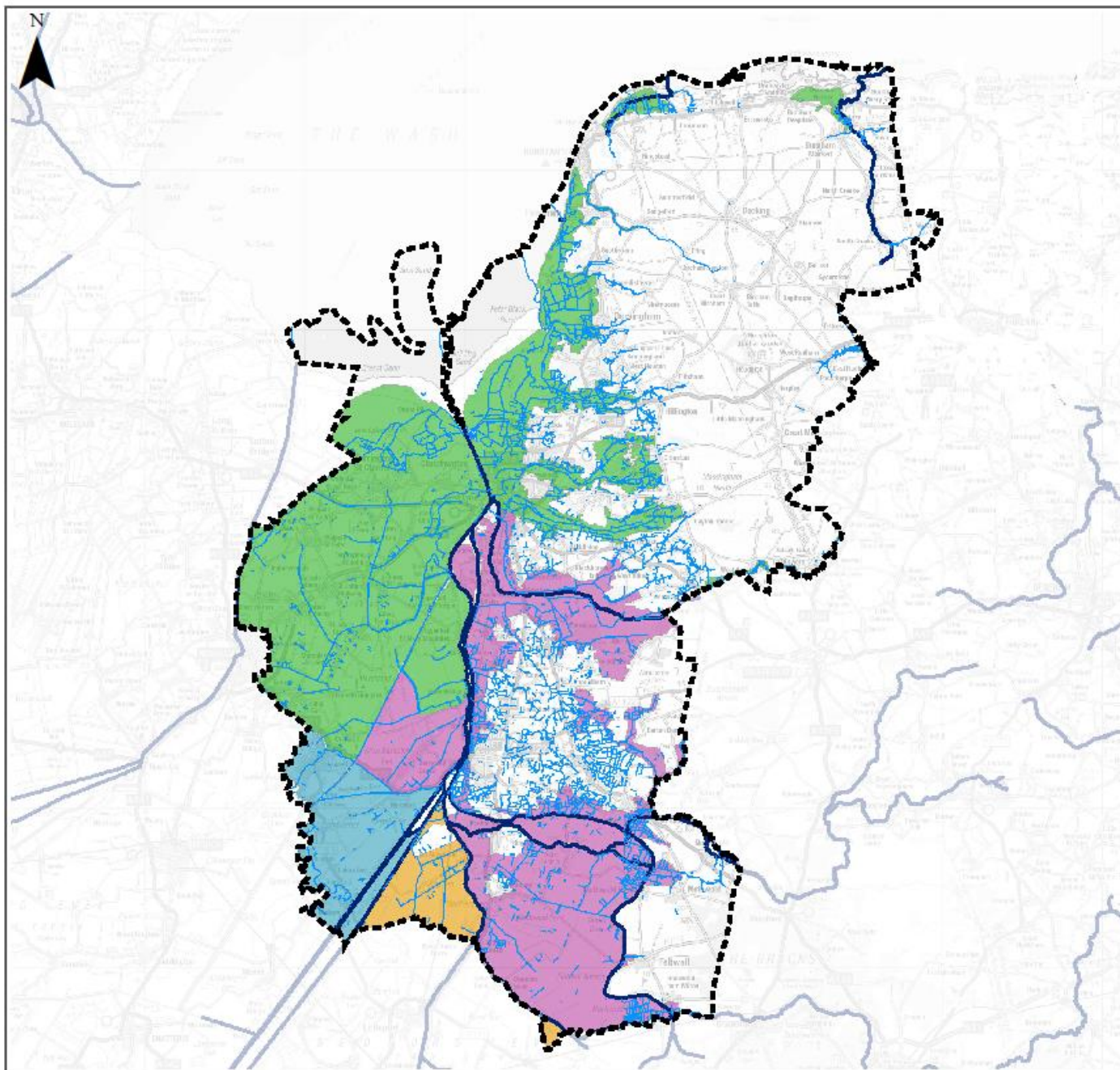
Risk of Flooding from Rivers and Sea

- A raster risk based map using national data, published online and replicated in the Level 2 SFRA mapping
- Shows risk taking flood defences into account
- Used by insurers and mortgage providers



Watercourse and coastline data

- IDB areas mapped in Level 1 SFRA
- Level 1 maps; Main Rivers and DRN (Detailed River Network – shows all watercourses)
- Level 2 maps: IDB drains and DRN
- Any watercourse that is not a Main River is an Ordinary Watercourse
- Coastline shown on all relevant maps



Notes

Watercourse information displayed in this map is taken from Norfolk County Council's version of the Environment Agency's Detailed River Network dataset.

Key Plan



Legend

- Administrative area
- Ordinary watercourses
- Main Rivers outside Kings Lynn and West Norfolk
- IDB Administrative**
 - Downham Market Group of Internal Drainage Boards
 - Ely Group of Internal Drainage Boards
 - Middle Level Commissioners
 - Water Management Alliance

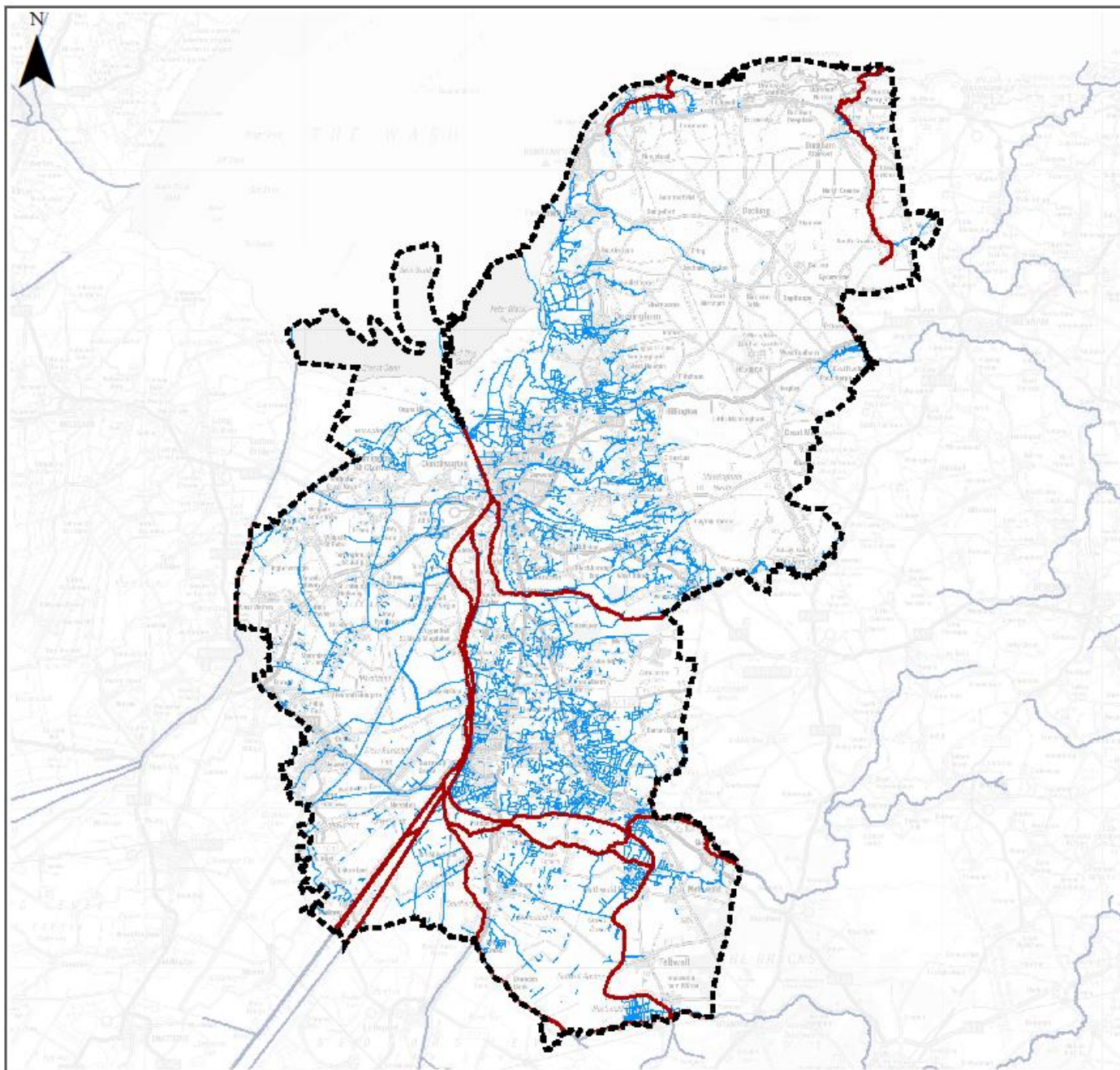
0 5 10 20 30 40 50
km

STRATEGIC FLOOD RISK ASSESSMENT LEVEL 1 APPENDIX B - IDB DISTRICTS, KING'S LYNN AND WEST NORFOLK

Reproduced from Ordnance Survey mapping with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationary Office. © Crown copyright and database right 2017
© Ordnance Survey 100019340. Use of this data is subject to terms and conditions. EA ORN:
Special licence - Non-commercial Ref. Z31900

This document is the property of Jeremy Benn Associates Ltd.
It shall not be reproduced in whole or in part, nor disclosed
to a third party, without the permission of Jeremy Benn Associates Ltd.





Notes

Watercourse information displayed in this map is taken from Norfolk County Council's version of the Environment Agency's Detailed River Network dataset.

Key Plan



Legend

-  Administrative area
-  Main Rivers within Kings Lynn and West Norfolk
-  Main Rivers outside Kings Lynn and West Norfolk
-  Ordinary watercourses

0 5 10 20 30 40 50
km

STRATEGIC FLOOD RISK ASSESSMENT LEVEL 1 APPENDIX B - ORDINARY WATERCOURSES KING'S LYNN AND WEST NORFOLK

Reproduced from Ordnance Survey mapping with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationary Office. © Crown copyright and database right 2017. © Ordnance Survey 100019340. Use of this data is subject to terms and conditions. EA ORN: Special licence - Non-commercial Ref. Z31900

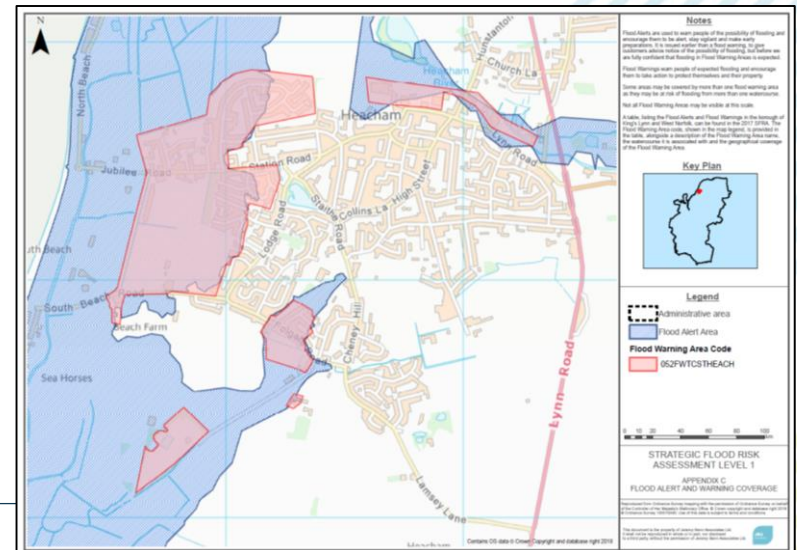
This document is the property of Jeremy Benn Associates Ltd. It shall not be reproduced in whole or in part, nor disclosed to a third party, without the permission of Jeremy Benn Associates Ltd.



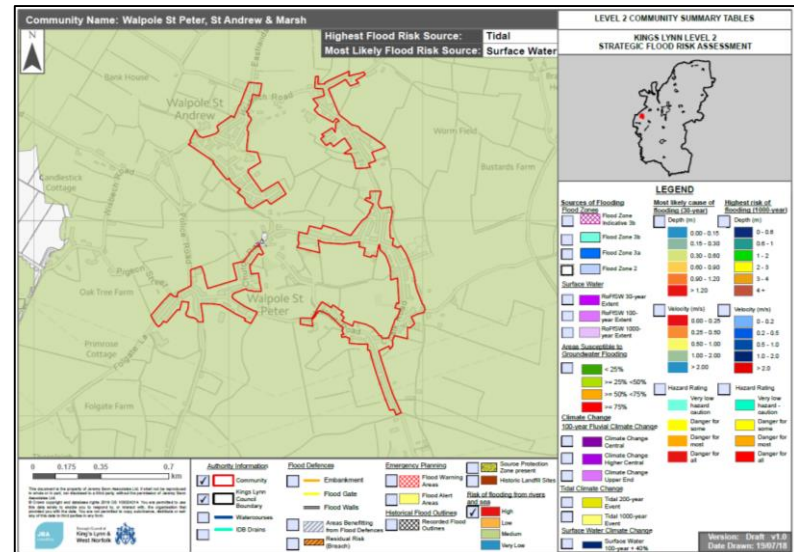
Flood defences and flood warning



Detailed defence data (type/
condition/ standard) (Level 1)
Flood warning and alert areas
(Level 1 and Level 2)



JBA
consulting



- Areas benefitting from defences (Level 2)
- Risk of flooding from rivers and the sea (Level 2)

Most likely/ highest risk data

- The Level 2 SFRA identified which sources of flood risk were the most likely and highest risk for each community
 - These are shown on the maps for those communities
 - More likely: the type of flooding experienced most frequently
 - Highest risk: the type of flooding that would cause the highest damage if it occurred
-

- Community Name: Kings Lynn including West Lynn**

Highest Flood Risk Source: Tidal / Coastal
Most Likely Flood Risk Source: Surface Water

LEVEL 2 COMMUNITY SUMMARY TABLES

KINGS LYNN LEVEL 2 STRATEGIC FLOOD RISK ASSESSMENT

LEGEND

Sources of Flooding

Flood Zones

 - Flood Zone Indicative 3b
 - Flood Zone 3b
 - Flood Zone 3a
 - Flood Zone 2

Surface Water

 - RoFSW 30-year Extent
 - RoFSW 100-year Extent
 - RoFSW 1000-year Extent

Areas Susceptible to Groundwater Flooding

 - < 25%
 - >= 25% < 50%
 - >= 50% < 75%
 - >= 75%

Climate Change

100-year Fluvial Climate Change

 - Climate Change Central
 - Climate Change Higher Central
 - Climate Change Upper End

Tidal Climate Change

 - Tidal 200-year Event
 - Tidal 1000-year Event

Surface Water Climate Change

 - Surface Water 100-year - 40%

Hazard Rating

Very low hazard - caution

Danger for some

Danger for most

Danger for all

Flood Defences

 - Community
 - Kings Lynn Council Boundary
 - DRN
 - IDB Drains
 - Embankment
 - Flood Gate
 - Flood Walls
 - Areas Benefiting from Flood Defences Residual Risk

Emergency Planning

 - Flood Warning Areas
 - Flood Alert Areas
 - Historical Flood Outlines
 - Recorded Flood Outlines

Source Protection

 - Source Protection Zone present
 - Historic Landfill Sites

Risk of flooding from rivers and sea

 - High
 - Low
 - Medium
 - Very Low

Scale: 0 0.5 1 2 km

Authority Information:

 - Community
 - Kings Lynn Council Boundary
 - DRN
 - IDB Drains

Emergency Planning:

 - Flood Warning Areas
 - Flood Alert Areas
 - Historical Flood Outlines
 - Recorded Flood Outlines

Source Protection:

 - Source Protection Zone present
 - Historic Landfill Sites

Risk of flooding from rivers and sea:

 - High
 - Low
 - Medium
 - Very Low

Climate Change:

100-year Fluvial Climate Change:

 - Climate Change Central
 - Climate Change Higher Central
 - Climate Change Upper End

Tidal Climate Change:

 - Tidal 200-year Event
 - Tidal 1000-year Event

Surface Water Climate Change:

 - Surface Water 100-year - 40%

Hazard Rating:

Very low hazard - caution

Danger for some

Danger for most

Danger for all

Flood Defences:

 - Community
 - Kings Lynn Council Boundary
 - DRN
 - IDB Drains
 - Embankment
 - Flood Gate
 - Flood Walls
 - Areas Benefiting from Flood Defences Residual Risk

Emergency Planning:

 - Flood Warning Areas
 - Flood Alert Areas
 - Historical Flood Outlines
 - Recorded Flood Outlines

Source Protection:

 - Source Protection Zone present
 - Historic Landfill Sites

Risk of flooding from rivers and sea:

 - High
 - Low
 - Medium
 - Very Low

Scale: 0 0.5 1 2 km

Authority Information:

 - Community
 - Kings Lynn Council Boundary
 - DRN
 - IDB Drains

Emergency Planning:

 - Flood Warning Areas
 - Flood Alert Areas
 - Historical Flood Outlines
 - Recorded Flood Outlines

Source Protection:

 - Source Protection Zone present
 - Historic Landfill Sites

Risk of flooding from rivers and sea:

 - High
 - Low
 - Medium
 - Very Low

Climate Change:

100-year Fluvial Climate Change:

 - Climate Change Central
 - Climate Change Higher Central
 - Climate Change Upper End

Tidal Climate Change:

 - Tidal 200-year Event
 - Tidal 1000-year Event

Surface Water Climate Change:

 - Surface Water 100-year - 40%

Hazard Rating:

Very low hazard - caution

Danger for some

Danger for most

Danger for all

Flood Defences:

 - Community
 - Kings Lynn Council Boundary
 - DRN
 - IDB Drains
 - Embankment
 - Flood Gate
 - Flood Walls
 - Areas Benefiting from Flood Defences Residual Risk

Emergency Planning:

 - Flood Warning Areas
 - Flood Alert Areas
 - Historical Flood Outlines
 - Recorded Flood Outlines

Source Protection:

 - Source Protection Zone present
 - Historic Landfill Sites

Risk of flooding from rivers and sea:

 - High
 - Low
 - Medium
 - Very Low

Scale: 0 0.5 1 2 km

Authority Information:

 - Community
 - Kings Lynn Council Boundary
 - DRN
 - IDB Drains

Emergency Planning:

 - Flood Warning Areas
 - Flood Alert Areas
 - Historical Flood Outlines
 - Recorded Flood Outlines

Source Protection:

 - Source Protection Zone present
 - Historic Landfill Sites

Risk of flooding from rivers and sea:

 - High
 - Low
 - Medium
 - Very Low

Climate Change:

100-year Fluvial Climate Change:

 - Climate Change Central
 - Climate Change Higher Central
 - Climate Change Upper End

Tidal Climate Change:

 - Tidal 200-year Event
 - Tidal 1000-year Event

Surface Water Climate Change:

 - Surface Water 100-year - 40%

Hazard Rating:

Very low hazard - caution

Danger for some

Danger for most

Danger for all

Flood Defences:

 - Community
 - Kings Lynn Council Boundary
 - DRN
 - IDB Drains
 - Embankment
 - Flood Gate
 - Flood Walls
 - Areas Benefiting from Flood Defences Residual Risk

Emergency Planning:

 - Flood Warning Areas
 - Flood Alert Areas
 - Historical Flood Outlines
 - Recorded Flood Outlines

Source Protection:

 - Source Protection Zone present
 - Historic Landfill Sites

Risk of flooding from rivers and sea:

 - High
 - Low
 - Medium
 - Very Low

Scale: 0 0.5 1 2 km

Authority Information:

 - Community
 - Kings Lynn Council Boundary
 - DRN
 - IDB Drains

Emergency Planning:

 - Flood Warning Areas
 - Flood Alert Areas
 - Historical Flood Outlines
 - Recorded Flood Outlines

Source Protection:

 - Source Protection Zone present
 - Historic Landfill Sites

Risk of flooding from rivers and sea:

 - High
 - Low
 - Medium
 - Very Low

Climate Change:

100-year Fluvial Climate Change:

 - Climate Change Central
 - Climate Change Higher Central
 - Climate Change Upper End

Tidal Climate Change:

 - Tidal 200-year Event
 - Tidal 1000-year Event

Surface Water Climate Change:

 - Surface Water 100-year - 40%

Hazard Rating:

Very low hazard - caution

Danger for some

Danger for most

Danger for all

Flood Defences:

 - Community
 - Kings Lynn Council Boundary
 - DRN
 - IDB Drains
 - Embankment
 - Flood Gate
 - Flood Walls
 - Areas Benefiting from Flood Defences Residual Risk

Emergency Planning:

 - Flood Warning Areas
 - Flood Alert Areas
 - Historical Flood Outlines
 - Recorded Flood Outlines

Source Protection:

 - Source Protection Zone present
 - Historic Landfill Sites

Risk of flooding from rivers and sea:

 - High
 - Low
 - Medium
 - Very Low

Scale: 0 0.5 1 2 km

Authority Information:

 - Community
 - Kings Lynn Council Boundary
 - DRN
 - IDB Drains

Emergency Planning:

 - Flood Warning Areas
 - Flood Alert Areas
 - Historical Flood Outlines
 - Recorded Flood Outlines

Source Protection:

 - Source Protection Zone present
 - Historic Landfill Sites

Risk of flooding from rivers and sea:

 - High
 - Low
 - Medium
 - Very Low

Climate Change:

100-year Fluvial Climate Change:

 - Climate Change Central
 - Climate Change Higher Central
 - Climate Change Upper End

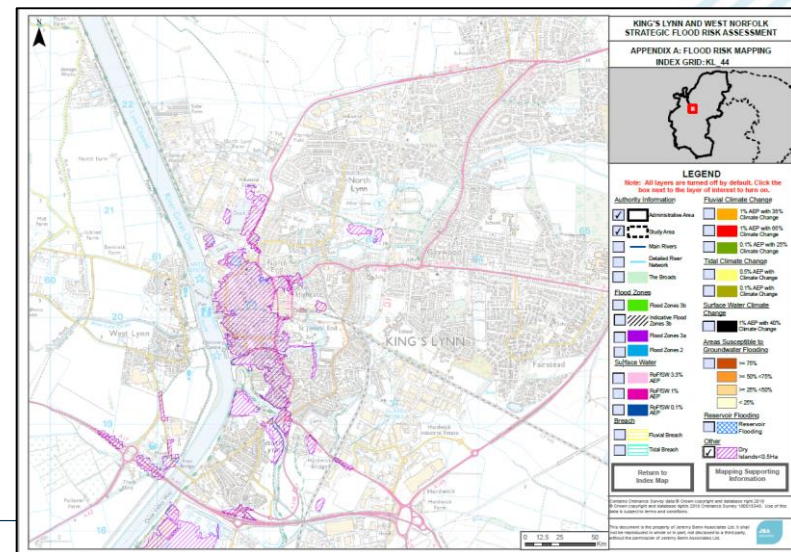
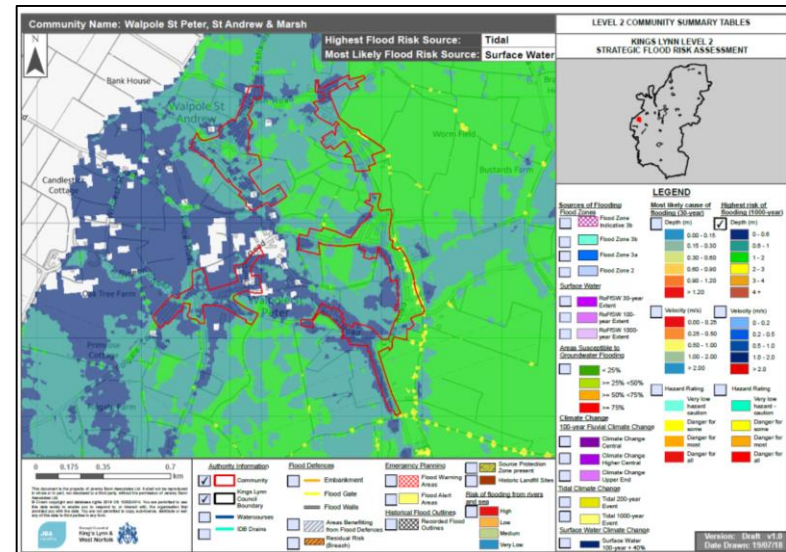
Tidal Climate Change:

 - Tidal 200-year Event
 - Tidal 1000-year Event

Surface Water Climate Change:

 - Surface Water 100-year - 40%

Hazard Rating



- Residual risk (breach) (Level 1/ Level 2)
- Tidal/ fluvial undefended hazard (Level 2)
- Dry islands (Level 1)

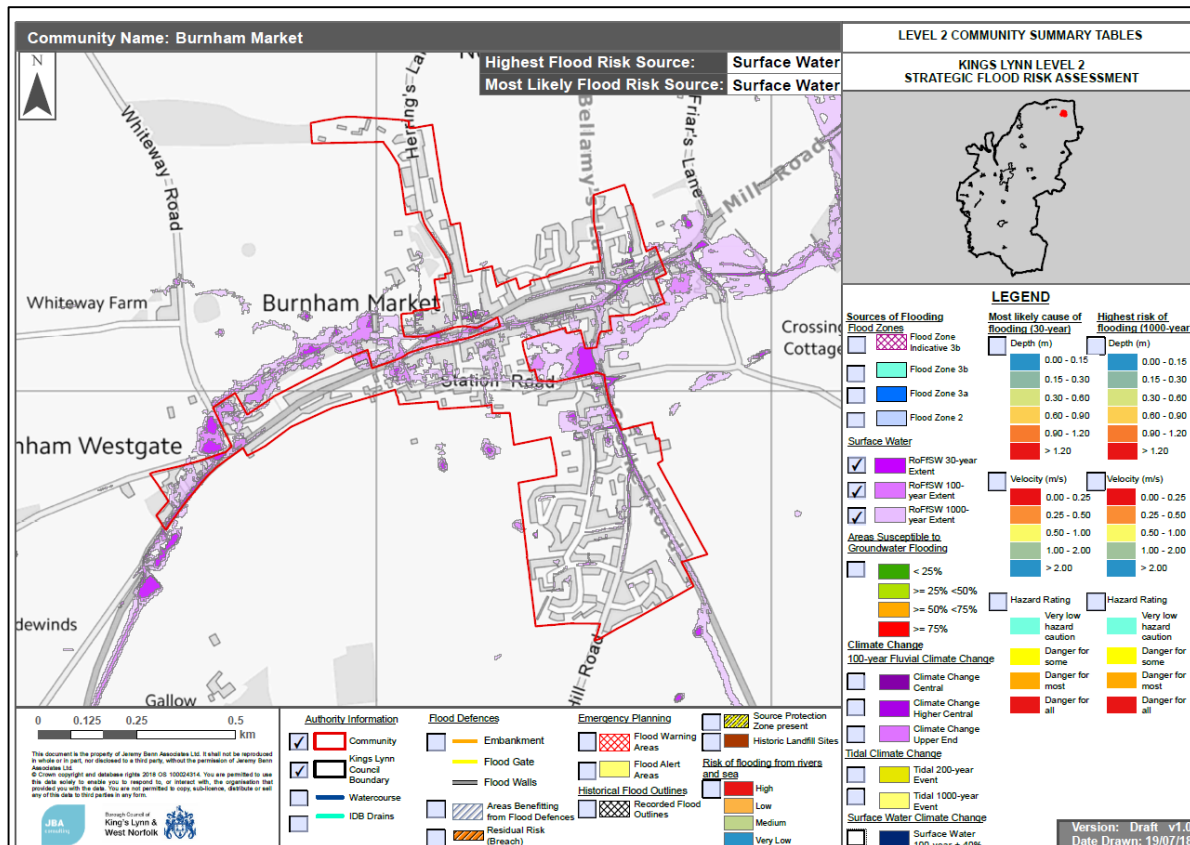
- [illegible]

Surface water flood risk

Surface water flood map

Risk of flooding from surface water map (Level 1 and Level 2)
Shown as high, medium and low on gov.uk

<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

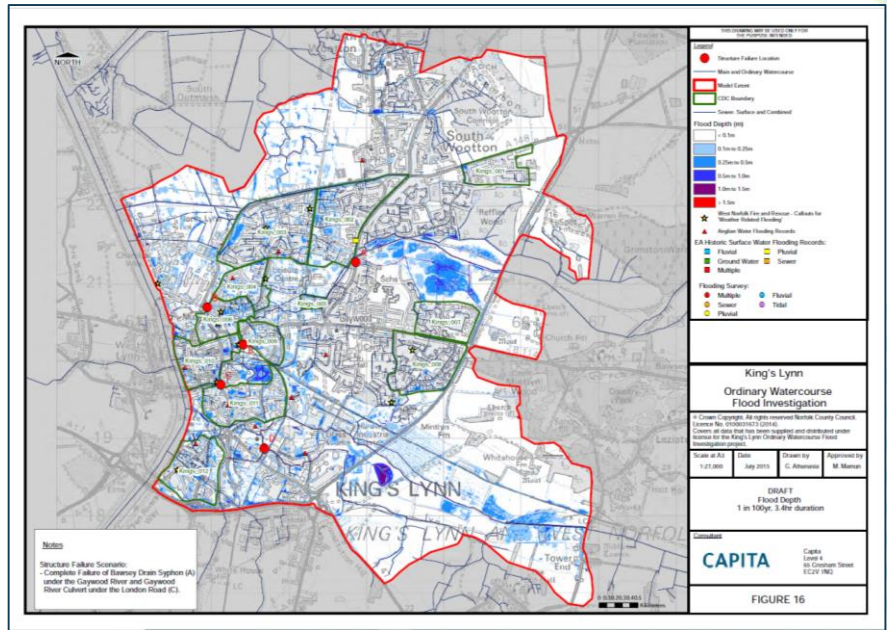


Most likely/ highest risk data

- The Level 2 SFRA identified which sources of flood risk were the most likely and highest risk for each community
 - These are shown on the maps for those communities
 - More likely: the type of flooding experienced most frequently
 - Highest risk: the type of flooding that would cause the highest damage if it occurred
-

Surface Water Management Plan

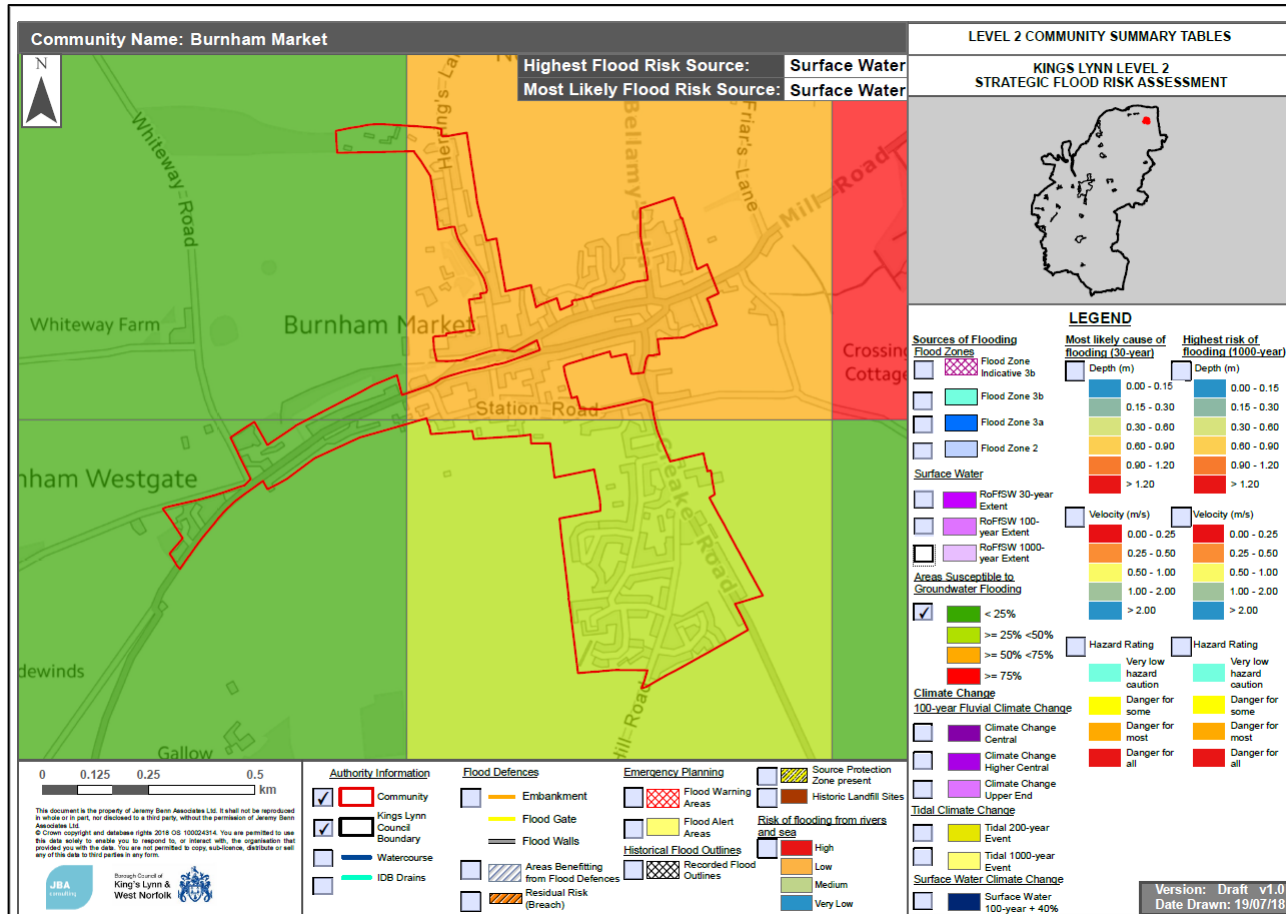
- King's Lynn, Downham Market, Wimbotsham, Snettisham and Heacham
- Critical Drainage Catchments and modelling outputs
- Take into account in FRAs and identify whether the development can contribute to SWMP actions



<https://www.west-norfolk.gov.uk/info/20098/water-management-and-flooding/173/surface-water>

Groundwater flood risk

Flooding from groundwater



Areas susceptible to groundwater flooding (Level 1 and Level 2)

Other sources

Other sources of flooding

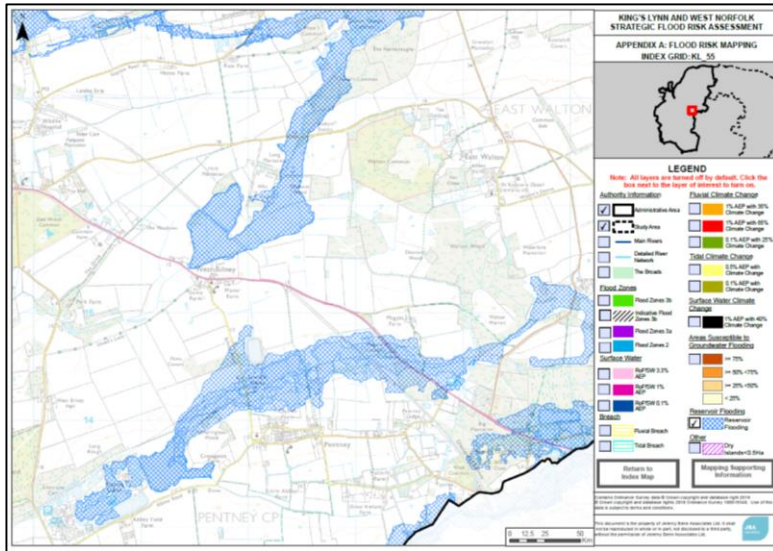


Table 6-2: Sewer flooding register for the Borough of King's Lynn and West Norfolk

Location	Postcode	Recorded flood incidents
Wisbech	PE14 0	2
Walton Highway/ West Walton	PE14 7	5
Emneth	PE14 8	7
King's Lynn	PE30 1	1
King's Lynn	PE30 2	6
King's Lynn	PE30 3	8
King's Lynn	PE30 4	11
King's Lynn	PE30 5	5
Ingoldisthorpe	PE31 6	1
Heacham	PE31 7	13
Burnham Deepdale/ Brancaster Straithe	PE31 8	2
Pott Row/ Grimston/ Middleton/ Roydon/ Gayton	PE32 1	24
Watlington/ West Winch	PE33 0	4

Reservoir flooding (Level 1)

IDB drains and standard of protection (Level 1)

Descriptions: historic flooding, sewers, highway drainage (Level 1 and Level 2)

Climate change information

