



Engineering Support Practice Ltd

www.esp.me.uk

Engineering for life

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FLOOD RISK ASSESSMENT

FOR A PROPOSED DEVELOPMENT AT

No. 1 POPENHOE COTTAGE OFF STATION ROAD,

EMNETH, WISBECH, PE14 8DJ.

MAP REFERENCE TF 549989,308732.

THE DEVELOPMENT IS THAT OF CONSTRUCTING A RESIDENTIAL REPLACEMENT DWELLING OWING TO THE EXISTING BARN NOW BEING A NON VIABLE OPTION TO CONVERT. A RAISED GROUND FLOOR LEVEL WILL PROVIDE MITIGATION AGAINST FLOODING, THERE BEING NO FLOOD RISK GENERATED BY FAILURES OF THE TIDAL RIVER NENE OR RIVER GREAT OUSE DEFENCES, SLEEPING ACCOMODATION IS PLACED ON THE FIRST FLOOR.

Report prepared by:

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1.0 Introduction.

1.1 The site (NGR. TF 549989, 308732.) placed to the north of 1. Popenhoe Cottage, Station Road will be the subject of a Planning Application by Will Smith of Carlyon Architecture, on behalf of Mr. Mrs. Sutton. It will be for the construction of a replacement dwelling owing to the proposed conversion of the existing barn now being a non-viable option. Access / Egress to the site will be via Station Road no problems are envisaged with access or egress of the site. (Appendix 5/6)

1.2 The site is to the southeast of Station Road, north of 1. Popenhoe Cottages. (Appendix 5)

1.3 As required the site now must comply with the National Planning Policy Framework (NPPF), together with the National Planning Policy Guidance (NPPG) 2021, Section "Flood Risk and Coastal Change". (Appendix 9) A Flood Risk Assessment has been prepared to comply with the requirements of the NPPF/ NPPG. the Borough Planners and the Environment Agency (EA) that the development is within such guidelines.

1.4 The Environment Agency has been contacted to gain their advice and information on points relating to the Flood Risk Assessment. The site is identified as being within Environment Agency Flood Zone 3 and Borough Council of Kings Lynn and West Norfolk Strategic Flood Risk Assessment Fluvial Flood Risk Area Category 3. (Appendix 1,2,3) It is within the Kings Lynn Internal Drainage Board (KLIDB) District. A Boards Main Drain is identified as being 75m. to the northwest of the site running immediately on the southeast side of Station Road. Tidal Hazard Mapping is available from the Environment Agency to assist in the process of assessing appropriate flood mitigation measures and indicates that there is NO risk from theoretical breaching scenarios posing a threat to the site, therefore site specific mitigation measures will be recommended. (Appendix 1/3)

1.5 Contact has been made with the Borough Council Planning Department and information has been gained about the Strategic Flood Risk Assessment document commissioned by the Borough Council of Kings Lynn and West Norfolk. (Appendix 7) and contact has been made with the IDB and correspondence received about the levels of service provided by the Boards watercourse. (Appendix 3,4)

1.6 Engineering Support Practice Ltd., was appointed in June 2022 to provide a Flood Risk Assessment in support of the Planning application.

2.0 Location.

2.1 The development site is located on the southeast side of Station Road, Emneth, Wisbech, PE14 8DJ., the site is currently an amenity area adjacent No.1 Popenhoe Cottages. (Appendix 5,6)

2.2 The site location and the extent of the area and the general development area are shown on the enclosed plans. (Appendix 5) NGR. TF,549989,308732.

2.3 The site is located within the Kings Lynn Internal Drainage Board District and is within the Borough Council of Kings Lynn and West Norfolk Planning Area. It is shown to be within the indicative Environment Agency (EA) Flood Risk Zone 3, Borough Council Kings Lynn West Norfolk, Strategic Flood Risk Assessment (BCKLWN, SFRA) Fluvial Flood Risk Area Category 3 (Appendix 2/3)

3.0 The Site, Sequential and Exception Tests.

3.1 The site is currently occupied by an existing barn which is beyond viable repair and or conversion. Therefore, the site will be subject to a planning application for a replacement residential dwelling, the ground floor suitably raised to mitigate the remote flood risk because of being in a Flood Zone 3 designated area. The site is protected to the 1 in 200 year level of service by the existing tidal defences of the River Nene and River Great Ouse administered by the Environment Agency. It is proposed to raise the ground floor level 600mm. above the adjacent ground level, apply flood resilience measures to a height of 600mm. above the finished ground floor level and for sleeping accommodation to be placed on the first floor level. Access / Egress will be via Station Road, Emneth.

3.2 The area of the development site is restricted to that as detailed on the enclosed plans and is bounded on the northwest by Station Road and existing agricultural development to the southeast with agricultural land on other sides. The site area is approximately 0.15 ha. (Appendix 5/6)

3.3 The proposed development site is as detailed on the enclosed plans (Appendix 5) showing its location within vicinity of Popenhoe Cottages, Station Road Emneth and the drainage features as per the plans within the FRA.

3.4 The site is currently within the rural area of and to the northeast of the Village of Emneth, Wisbech as adopted by the Borough of Kings Lynn and West Norfolk Council (BCKLWN) Local Development Plan (LDP) in 1998 and the new 2015 LDP. and as such it is assumed that the development is exempt from the sequential test.

3.5 The residential development is specifically identified within the NPPG. document and represented and placed within the "More Vulnerable" classification NPPF / NPPG. TABLE. 2 and therefore allowable within the Flood Zone 3 classification taking due regard of the BCKLWN. Planning Flood Risk, design guidance document. (Appendix 7 9)

3.6 However applying the Exception Test as detailed in NPPF. Cl. 102. and the Technical Guidance document Table 3 shows that as required under:

a). It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, as identified by the Borough Council of Kings Lynn and West Norfolk, Strategic Flood Risk Assessment. (Appendix 7)

b). The site-specific flood risk assessment 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 elsewhere.

The site is compliant with a) and b. (Appendix 9)

4.0 Existing flood alleviation measures

4.1 The site is located on the southeast side of Station Road, Emneth, Wisbech, PE14 8DJ. It is within the Borough Council of Kings Lynn and West Norfolk and within the Kings Lynn Internal Drainage Board District.

4.2 A Kings Lynn Internal Drainage Board "Main Drain" is located to the northwest of the site flowing southwest. (Appendix 3/6)

4.3 The existing standard of drainage within the Kings Lynn IDB District can deal with the 1 in 100 year fluvial event and confirmation of this has been received from the IDB., within correspondence. (Appendix 4) Inspections of the appropriate watercourse indicate that a minimum of 1m free board is available within the Boards systems and is compatible with the Department of Environment Food and Rural Affairs target of services for agricultural land and residential areas.

4.4 The Kings Lynn IDB. maintain their "Main Drains" on an annual basis and when required improvements works are carried out to these watercourses to ensure that a high level of services is maintained and is therefore considered to be at a low risk of flooding from the Boards watercourses. (Appendix 3/4)

4.5 Those tidal defences which are provided by the Environment Agency i.e., those provided along the frontage of the Tidal River Nene are designed to cope with the 1 in 200 year tidal event as required under NPPF. The level of these defences is set at + 6.3m. ODN. for hard defences and +7.0m.ODN. for earth embankments and this therefore provides protection for the current requirements.

4.6 Climate change and sea level rise have been considered (Appendix 1) and it is felt the existing defences provide the appropriate requirements for NPPF at the development location at the present time and extracts from the Borough Strategic Flood Risk Assessment are included in the appendices to support this statement. (Appendix 2,7) Utilising the information provided by the EA however, (Appendix 1) sea level rise, for the now required 100 year period, indicates a calculated rise of + 1.269m. by the year 2122, adding this to the current 1 in 200 year surge event of + 6.12m. gives a total surge level of + 7.39m. It can therefore be clearly seen that improvements to the Flood Defences will have to take place to safeguard the developed and developing areas surrounding Wisbech. Should however these improvements fail to materialise, and overtopping takes place, the site being some 3.50 km. form the Tidal River Nene can be at a low risk of flooding from such an event any (Appendix 1) the excess spillage being accommodated within the Internal Drainage Boards systems.

4.7 The current maintenance standard adopted by the Environment Agency for the tidal defences and those of the Kings Lynn IDB. For its "Main Drains" is such that it could be of high standard and meet with those requirements that would ensure that the level of service is retained and maintained into the future such that it is able to cope with climate change.

4.8 The surface water discharges will be dealt with applying the Sustainable Urban Drainage Systems (SUDS) principles with appropriate BRE 365 infiltration testing providing data for the design of soakaways or alternatively it being discharged to the KLIDB. main drain at agreed run-off rates subject to the consent procedures.

5.0 Potential sources of flooding

5.1 There are four potential sources of flooding which are identified as a result of this assessment.

- a) Local failures or blockages of the adjacent and or Kings Lynn IDB. Boards "Main Drains".**
- b) The 1 in 100 year fluvial event being exceeded in the Internal Drainage Board Main Drain.**
- c) The 1 in 200 year tidal event being exceeded which would cause overtopping or major failure of the Tidal River Nene Defences.**
- d) Extreme rainfall events.**

5.2 The probability of flooding from source:

- a) Is low owing to the high maintenance standards being achieved and managed by the Kings Lynn IDB. The system which is used to service this area is one that has been maintained at a high standard over the past and thus this together with inspections applied to the Boards area enhances the protection provided. (Appendix 4)**
- b) Should the 1 in 100 year fluvial event be exceeded the flood water would take up the available freeboard within the Boards watercourse and should this be exceeded flood water will extend into the lower agricultural land.**
- c) The Tidal Defences protecting the area were improved following the 1978 and 2013 Tidal Surge events and currently provide protection against the 1 in 200 year tidal event. However, these defences are at such a height that they will not fully protect against climate change, overtopping at the year 2122. The development site being some 3.5 kilometres away from the main area of tidal defences of Tidal River Nene would be at a low risk of flooding from any such over topping which would occur over a small period during the tide cycle curve, this being confirmed by the tidal overtopping hazard mapping data. (Appendix 1)**
- d) Should an extreme rainfall event subject the site to surface water flooding the raising of the finished ground floor level 600mm. above the adjacent ground level will provide adequate mitigation.**

5.3 The existing tidal defences together with the fluvial defences are such that providing maintenance of them remains to the current standard any event in excess of the protection standard would provide minimal over spilling and therefore since the over topping of the Tidal River would be of a small duration, it and that of the on-line storage would be available to absorb such impacts, it is considered that this would not adversely affect the site. (Appendix 1)

5.4 It should be noted that due regard should now be given to NPPF, which requires an account to be taken of a 100 year period when considering flood risk assessment. It is suggested that the surge level expectation in the year 2122 could be in the region of +1.269 m. higher than that predicted for current use, this being a level of + 7.39m. ODN. this would overwhelm the current defence levels and it is suggested that appropriate measures would be undertaken to safeguard the developed areas surrounding Wisbech with defences to adequately protect the area.

5.5 With regard to the Internal Drainage Board system again considerable protection is provided within the currently improved system design and due regard should be given to the maintenance standard adhered to by the Board throughout its water courses.

6.0 Extent of known flooding

6.1 Correspondence from the KLIDB Office indicate that there is no record of flooding within the development area.

6.2 Despite the heavy rain fall periods in 1978, 1998, 2000, 2008 and 2014 the area did not suffer flooding, but this is perhaps a reflection on the high level of service and maintenance provided by the IDB.

6.3 Additionally it should be noted that during the 1978 tidal event when areas of Wisbech was inundated there was no significant water level rises observed in the Boards District at this location despite there being defences that were below the current standards and therefore despite this development site being in the classified EA. Flood Zone 3 area and BCKLWN.SFRS Flood Zone Category 3 (Appendix 2), it is considered that there is a low risk of flooding from tidal events. This was also confirmed by the 2013 event when the 1978 levels were exceeded as no over topping, or flooding of the surrounding areas occurred.

6.4 Therefore taking into account the fore mentioned situations it can be considered that the Environment Agency and the Internal Drainage Board systems currently meets and provides protection to this site to the 1 in 100 year fluvial event scenario and the tidal defences provide the 1 in 200 year protection to the BCKLWN Flood zone areas Category 3 " High Risk" (> 0.1%), therefore the site is compliant with NPPF / NPPG requirements and appropriately placed to withstand future events taking into account climate change. It should be noted that whilst the site appears to be at a high risk of fluvial flooding the sources of such inundation a situated remotely to the south of the catchment with the intervening areas of landscape being a mosaic of water accommodating channels and flood protection embankments offering a sympathetic level of additional flood protection.

7.0 Probabilities and trends of flooding

7.1 The probability of this development site flooding from the local Internal Drainage Boards system is low. It should also be noted that despite being placed within the Flood Zone 3 area on the Environment Agency flood risk map and BCKLWN.SFRA. Category 3 Fluvial Flood Zone the area is protected by the Tidal Defences on the Tidal River Nene frontage, and it is deemed that these defences provide the necessary 1 in 200 year tidal event and beyond protection and therefore this complies with NPPF. / NPPG. It should be noted that climate change and sea level rises will take place over the next 100 years however such over topping levels will not adversely affect the site because the over topping would be very small duration and contained within the existing protection systems in and around Wisbech and those provided by the KLIDB. (Appendix 1)

7.2 Taking due regard of the suggested figures for sea level rise in NPPF indicates rise in the rate of change of increasing tide levels such that it is indicated that the surge by the year 2122 would be +7.39m. ODN. Should this be the case it is almost certain that appropriate measures to improve the level of service to the developed area of Wisbech would be implemented and maintain the required standard of protection currently enjoyed under NPPF. / NPPG. for the 1 in 200 year event.

7.3 The probability of the site flooding from the Tidal River Nene is technically remote because of the existing standard of defences which provide the 1 in 200 year tidal event level protection and is some 3.5 kilometres west of the development site any such major failure or failure of defences because of the extensive distance would offer little or no effect on water levels on the adjacent proposed site.

7.4 If under extreme conditions the level of fluvial flood water rose in the KLIDB's system this would not be of a sudden nature and it is probable that sufficient time would be available to take precautionary actions to limit the extent of the potential flood event.

7.5 It should be noted that the water levels of the drainage channels throughout the area will tend to rise because of the impacts of climate change however the existing system of defences together with the protection provided by the adjacent flood plains will provide mitigation.

8.0 Impacts of flooding

8.1 It is considered that there are no significant impacts of flooding to be anticipated for the proposed site bearing in mind the protection provided by the Environment Agency and the Kings Lynn IDB. flood defence systems. The development site is at a level which is above the 1 in 100 year fluvial event and protected to the BCKLWN SFRA. Tidal, 1 in 200 year event level of service, by the existing tidal defences despite being placed in the Flood Zone Category 3 by the BCKLWN. SFRA. data.

8.2 To ensure protection against extreme rainfall events and the Environment Agency Tidal River Nene flood zonnage classification data (Appendix 1) it is recommended that the finished ground floor level is placed 600mm. above the adjacent ground level to provide appropriate mitigation against such occurrences. It is recommended that flood resilience measures should be integrated into the dwelling design to a height of 0.60m. above the finished floor level.

9.0. Residual Risks – Extreme Event

9.1 Residual risk from extreme events to this site is low despite being in EA Flood Zone 3, BCKLWN SFRA Category 3. The protection afforded by the Tidal Flood Defences of Tidal River Nene and maintained by the Environment Agency are of such a high standard that it could be considered highly unlikely for a catastrophic failure to take place and adversely affect the development site. During an extreme event the current system of monitoring together with communication systems would provide warning to the development area of any likely flooding that would occur do to back flows in the Internal Drainage Boards Drainage system owing to inundations by tidal waters.

9.2 The protection afforded by the Kings Lynn IDB is compliant with NPPF, it must be recognised however that this protection will be eroded owing to climate change, but due consideration must be given to the fact that the IDB. continues to monitor the situation.

9.3 The general land levels in the proposed site is above the 1 in 100 year event predictions. (Appendix 4) Considering the climate change assessment, that there will be an increase in flows of 20% up to 2050 and beyond, it is still felt that no increase flood risk will occur on the development site, however mitigation against the flood risk will be applied by setting the proposed finished ground floor level 600mm. above the adjacent ground level.

9.4 Although within the Environment Agency Flood Zone 3, BCKLWN SFRA Category 3 according to NPPF / NPPG. classification the site is assessed to be at low risk of flooding due to the current standards of drainage and flood defence maintenance levels. The site is not located within a Tidal Functional Flood Plain and is protected to a high standard and therefore can be in a passive flood plain area it is also adjacent to the KLIDB. Main Drains, which are maintained and held at NPPF standards.

9.5 It is considered that there is no risk of flooding to adjoining properties because of this proposed development site.

9.6 In the extreme event of a serious blockage of the watercourse downstream within the Internal Drainage Board system or the over topping of the tidal defences protection would be afforded by the existing flood storage which is within the existing system of the Boards main drains. Should major events occur it is expected that flood warnings given by the Environment Agency and the Kings Lynn Internal Drainage Board (KLIDB) would be forthcoming and it would be expected that any occupancy during the period would take appropriate action as recommended by the Borough Council Emergency Action Plan.

10.0 Sustainable Urban Drainage (SUDS) and Water Framework Directive.

10.1 The BCKLWN. SFRA. Annex to Level 1 (Appendix 7,8) requires that a sustainable method of dealing with surface water run-offs is adopted on site together with due consideration of the Water Framework Directives to ensure that the over- arching environmental issues are dealt with and that no dis-benefits are created by the proposed development.

10.2 Surface Water from the development site will be disposed of utilising appropriate Sustainable Urban Drainage Systems (SuDs) principles. There are two options available that comply with the SuDs hierarchal designations, roof surface water run-offs should be initially dealt with by the installation of water-butts on all downpipe systems and then discharged to soak-aways designed to BRE 365 standards. Alternatively seek consent to discharge surface water to the adjacent Boards Main Drain. Access drives will be constructed from permeable surfaces to ensure flows are retained on site.

11.0 Conclusions and recommendations

11.1 As a result of the assessment the following conclusions and recommendations have been reached.

11.2 The proposed development site despite being in Environment Agency Tidal Zone 3, BCKLWN SFRA Category 3 is not considered to be in a Functional Tidal Flood Plain, it is in the Passive Flood Plain protected by existing tidal defences to a Tidal Flood Event 1 in 200 year level of service.

11.3 The site is located within the Kings Lynn Internal Drainage Board District and the standard of drainage provided at this site complies with the 1 in 100 year NPPF / NPPG. event and this accord with the DEFRA guideline for urban development. A minimum free board is provided to the water course which provides a standard of drainage to the lowest land within the catchment and further protection and an increasing level of service will be provided as and when required to maintain the required level of service. It is recommended that the proposed finished floor level is placed 600mm. above the adjacent ground level to ensure mitigation against extreme events with flood resilience measures incorporated into the dwelling design to a height off 0.60m. above the finished floor level with the sleeping accommodation placed on the first floor.

(Appendix 1/4)

11.4 Bearing in mind all of the fore mentioned and taking due regard of climate change which will erode the 1 in 200 year protection provided by the existing tidal defences and extensive overtopping up to 2122, will have a very limited affect on the catchment and therefore the site can be considered to be protected to NPPF specifications. Attention is drawn to the revised predictions for sea level rise by the year 2122, which is the period over which the assessment must extend, this indicates that a surge tide of the 1 in 200 year event type, by that date, could reach + 7.39m. ODN. This is clearly beyond the capabilities of the current defences to provide protection to the developed area up to the 1 in 200 year standard. It is therefore assumed that appropriate measures will be taken to ensure that the correct standard is retained for the area.

11.5 The surface water discharges will be dealt with applying the Sustainable Urban Drainage Systems (SUDS) principles with retention / attenuation on site.

11.6 It is considered that the site is suitable for the proposed development, it being compliant with the necessary requirements of the National Planning Policy Framework (NPPF) / National Planning Policy Guidelines (NPPG) flood risk criteria.

11.7 Additionally it is also recommended that residents must be made aware of Emergency Procedures that reflect the importance of the safety of the public and be supplied with a Flood Emergency Preparedness Plan agreed with the BCKLWN Emergency Planning Department to assist and direct during a flood emergency event. It is felt that it would be appropriate for the residents to ensure that they are fully conversant with the Flood Warning Systems of the Environment Agency, the Borough of Kings Lynn and West Norfolk District Emergency Procedures and to familiarize themselves with the location of the Kings Lynn IDB. Office to enable access to information on Heavy Rainfall Events and or Flood Events increasing the risk of flooding to the development area. Residents should register with the Environment Agency (EA) to receive the "Direct Line Flood Warnings" service to provide notification of extreme tidal events.

APPENDIX 1

From: Enquiries_EastAnglia <Enquiries_EastAnglia@environment-agency.gov.uk>
Sent: 15 November 2021 14:22
To: ben.hornigold@btinternet.com
Subject: EAN/2021/238444 - Station Road, Emneth, Wisbech, PE14 8DJ
Attachments: Maximum Flood Depth_238444.pdf; Maximum Flood Velocity_238444.pdf; Maximum Hazard Rating_238444.pdf; Modelled Breach Locations_238444.pdf; 238444 defence info.pdf

Dear Ben

Enquiry regarding Products 4 and 8 for Station Road, Emneth, Wisbech, PE14 8DJ

Thank you for your enquiry which we received on 19 October 2021 about a site in Emneth.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

Product 4

We have consulted our Partnership and Strategic Overview team (PSO) who report that they are unable to provide a Product 4 for this site. The Flood Map for Planning (Rivers and Sea) in this area has been produced from our Fenland Flood Zone Improvements modelling. This modelling incorporated direct rainfall and an equilibrium, undrained water level, to better represent an undefended scenario for the Fens in the absence of drainage. This modelling represents the Fens in a flood scenario without flood defences and without any of the drainage infrastructure which has created the Fens as they currently are. This is a broadscale model, intended for use in catchment scale studies, and as such further detail may be required for site-specific flood risk assessments.

If you have any questions regarding the above, please do email us at enquiries_eastanglia@environment-agency.gov.uk and we will put you in contact with a member of the PSO team.

We are able to provide the attached defence information. Asset Management Data and Information can be found online using this link: <https://environment.data.gov.uk/asset-management/index.html>

Please read the Open Government Licence: www.nationalarchives.gov.uk/doc/open-government-licence/version/3/ which explains the permitted use of the defence information we have provided.

Product 8

The information we in relation to Tidal Hazard Mapping is attached to this email.

Name	Product 8
Description	Breach Hazard Map centred on Station Road, Emneth.
Licence	Open Government Licence
Information Warnings	1.0 This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped. 2.0 The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches,

	<p>other combinations of breaches, different sized tidal surges or flood flows may all give different results.</p> <p>3.0 The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.</p> <p>4.0 Please contact the Environment Agency for further information on emergency planning associated with flood risk in this area.</p>
Information Warning - OS background mapping	<p><i>The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.</i></p>
Attribution	<p>Contains Ordnance Survey data © Crown copyright 2017 Ordnance Survey 100024198. Contains Environment Agency information © Environment Agency and/or database rights.</p>

Flood Map for Planning (Rivers and Sea)

The Flood Map for Planning (Rivers and Sea) can be viewed and downloaded as a PDF file on GOV.UK by following this link: <https://flood-map-for-planning.service.gov.uk>

Long Term Flood Risk Information

Long term flood risk mapping including: Risk of Flooding from Rivers or the Sea, Flood Risk from Surface Water and Flood Risk from Reservoirs can be viewed on GOV.UK: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

Data Available Online

Many of our flood datasets are available online:

- Flood Map For Planning ([Flood Zone 2](#), [Flood Zone 3](#), [Flood Storage Areas](#), [Flood Defences](#), [Areas Benefiting from Defences](#))
- [Risk of Flooding from Rivers and Sea](#)
- [Historic Flood Map](#)
- [Current Flood Warnings](#)

Climate change allowances

Please note we have published revised **climate change allowances**, which are available online here: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. These new allowances will need to be reflected in your Flood Risk Assessment. If you want to discuss this please call our Sustainable Places team on 020 8474 5242.

What's In Your BackYard (WIYBY) is no longer available

Most of the data is still available via other sharing services such as [DATA.GOV.UK](#), [MAGIC map](#) and new [GOV.UK digital services](#). Where the datasets are no longer available as maps, you will be able to download and use within specialist applications.

To find out all the services the Environment Agency have available, please click [here](#).

Additional information

Please be aware that we now charge for planning advice provided to developers, agents and landowners. If you would like advice to inform a future planning application for this site then please complete our <https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion> and email it to our Sustainable Places team at: planning.ipswich@environment-agency.gov.uk.

They will initially provide you with a free response identifying the following:

- the environmental constraints affecting the proposal;
- the environmental issues raised by the proposal;
- the information we need for the subsequent planning application to address the issues identified and demonstrate an acceptable development;
- any required environmental permits.

If you require any further information from them (for example, a meeting or the detailed review of a technical document) they will need to set up a charging agreement. Further information can be found on our [website](#).

Please get in touch if you have any further queries or contact us within two months if you would like us to review the information we have sent.

Kind regards

Karen

Karen Brown
Customers & Engagement Officer
Customers & Engagement Team, East Anglia Area
Environment Agency

Please note that our offices are closed and we are unable to receive mail.

enquiries_eastanglia@environment-agency.gov.uk

Working at home: Monday, Tuesday, Wednesday



If you use the Defra **Data Sharing Platform (DPS)** you can use this [link](#) to find out about new and updated datasets and much more. Not using DPS yet? **Register for an account** [here](#) and you will receive email notifications direct.

**Creating a better place
for people and wildlife**



CORONAVIRUS
PROTECT YOURSELF & OTHERS

For the latest guidance:
- INTRANET.EA.GOV
- NHS.UK/coronavirus
- GOV.UK/coronavirus



Information in this message may be confidential and may be legally privileged. If you have received this message by mistake, please notify the sender immediately, delete it and do not copy it to anyone else. We have checked this email and its attachments for viruses. But you should still check any attachment before opening it. We may have to make this message and any reply to it public if asked to under the Freedom of Information Act, Data Protection Act or for litigation. Email messages and attachments sent to or from any Environment Agency address may also be accessed by someone other than the sender or recipient, for business purposes.

Flood map for planning

Your reference
emneth

Location (easting/northing)
549941/308886

Created
15 Nov 2021 16:00

Your selected location is in flood zone 3 – an area with a high probability of flooding that benefits from flood defences.

This means:

- you may need to complete a flood risk assessment for development in this area
- you should ask the Environment Agency about the level of flood protection at your location and request a Flood Defence Breach Hazard Map (You can email the Environment Agency at: enquiries@environment-agency.gov.uk)
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (find out more at www.gov.uk/guidance/flood-risk-assessment-standing-advice)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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Environment Agency

Flood map for planning

Your reference
emneth

Location (easting/northing)
549941/308886

Scale
1:2500

Created
15 Nov 2021 16:00



Selected point



Flood zone 3



Flood zone 3: areas benefiting from flood defences



Flood zone 2



Flood zone 1



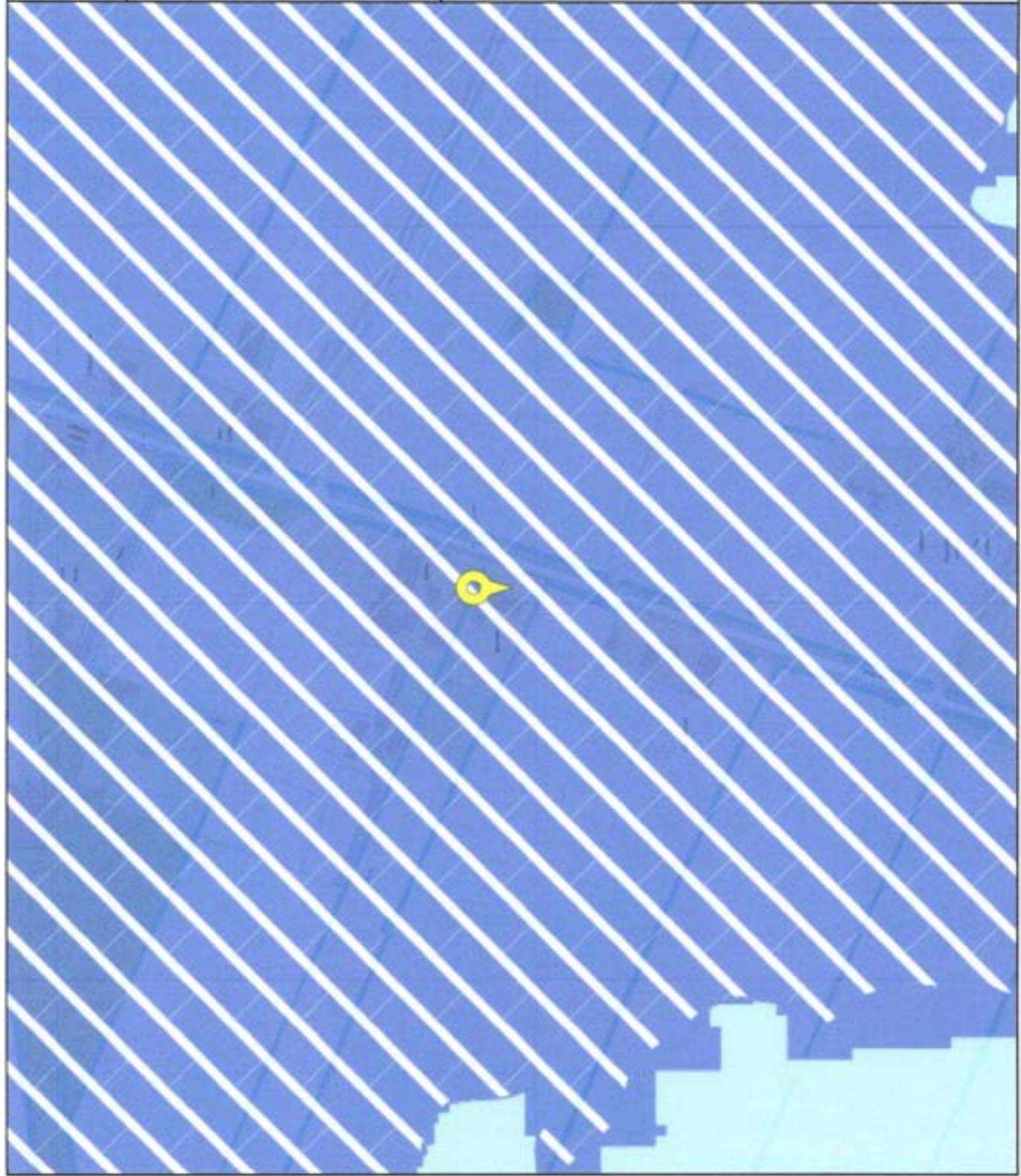
Flood defence



Main river



Flood storage area



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1. [Home](#)
2. Environment Agency
3. Historic Flood Map

Historic Flood Map

Published by:

Environment Agency

Last updated:

05 November 2021

Topic:

Not added

Licence:

Other Licence

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Summary

The Historic Flood Map is a GIS layer showing the maximum extent of individual Recorded Flood Outlines from river, the sea and groundwater springs that meet a set criteria. It shows areas of land that have previously been subject to flooding in England. This excludes flooding from surface water, except in areas where it is impossible to determine whether the source is fluvial or surface water but the dominant source is fluvial.

The majority of records began in 1946 when predecessor bodies to the Environment Agency started collecting detailed information about flooding incidents, although we hold limited details about flooding

[View full summary](#)

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Related datasets

- [Recorded Flood Outlines](#)
- [Recorded Flood Extents](#)
- [Rivers Agency \(NI\) Historical Flood Map Event Outlines \(Metadata\)](#)
- [Flood Map: Areas Benefiting from Flood Defences](#)

Search

Search

Find data

Data links

Link to the data	Format	File added	Data preview
Download Historic Flood Map ESRI REST Endpoint . Format: N/A. Dataset: Historic Flood Map	N/A	05 November 2021	Not available
Download DSP_CUSTOMER_FORUM . Format: N/A. Dataset: Historic Flood Map	N/A	05 November 2021	Not available
Download HistoricFloodMap_WFS . Format: N/A. Dataset: Historic Flood Map	N/A	05 November 2021	Not available
Download HistoricFloodMap_WMS . Format: N/A. Dataset: Historic Flood Map	N/A	05 November 2021	Not available
Download HistoricFloodMap_Download . Format: N/A. Dataset: Historic Flood Map	N/A	05 November 2021	Not available

Additional information

► Details

Contact

Enquiries

<https://support.environment.data.gov.uk/hc/en-gb>

Freedom of Information (FOI) requests

[National Customer Contact Centre Freedom of information requests for this dataset](#)

Licence information

Open Government Licence

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Flood Defence Details

Reference:		EAN/2021/23844 - 1 Popenhoe Cottage, Station Road, Emmeth, PE14 8DJ				
Watercourse:		River Great Ouse				
Defence ID	Defence Type	Location (Easting/Northing)	Standard of Protection (Return Period)	Overall Condition Grade	Downstream Crest Level (mAOD)	Upstream Crest Level (mAOD)
135374	Embankment	Defence details provided between 559684,310092 and 560274,307263	1 in 200	2	7.00	7.00
135530	Embankment		1 in 200	2	7.00	7.00
85929	Wall		1 in 200	2	7.00	7.00
85930	Wall		1 in 200	3	7.00	7.00
85931	Wall		1 in 200	3	7.00	7.00
81815	Wall		1 in 200	2	7.00	7.00
97627	Embankment		1 in 200	2	7.00	7.00

Modelled Breach Locations centred on Station Road, Emneth

NGR TF4999008682
Ref 238444
Created 09/11/2021

Environment Agency
Bromholme Lane,
Brampton,
Cambridgeshire
PE28 4NE



Legend

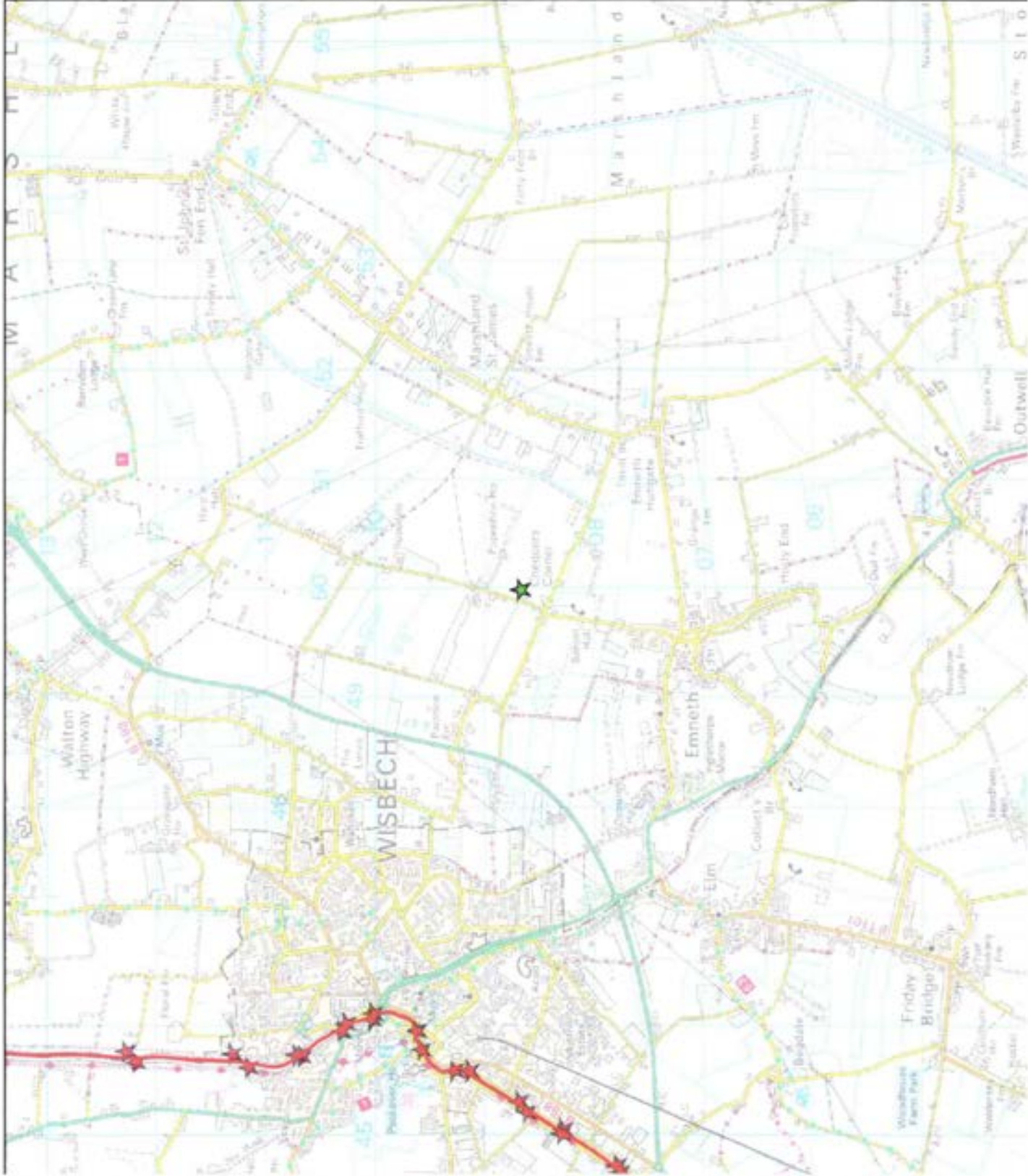
- ★ Site
- ★ Breach Locations 0.5%CC AEP



Information

1. The map shows the locations of computer simulated breaches. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, or different flood flows may all give different results.
2. If you require the results from individual breach simulations, please request these by emailing Enquiries_EastAnglia@environment-agency.gov.uk
3. The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring.
4. AEP - Annual Exceedance Probability - The probability of a given event occurring in any one year. Please note this is not a return period.

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk



Map Showing the Maximum Hazard Rating (combined breach) centred on Station Road, Emneth

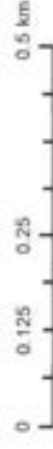
NGR TF4999008682
Ref 238444
Created 09/11/2021

Environment Agency
Bromholme Lane,
Brampton,
Cambridgeshire
PE28 4NE



Legend

- ★ Site
- Danger For All
- Danger For Most
- Danger For Some
- Low Hazard



Information

1. This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater and maximum values of these are also mapped.
2. The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.
3. The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring.

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Email: enquiries@environment-agency.gov.uk



Map Showing the Maximum Flood Velocity (combined breach) centred on Station Road, Emneth

NGR TF4999008682
 Ref 238444
 Created 09/11/2021

Environment Agency
 Bromholme Lane,
 Brampton,
 Cambridgeshire
 PE28 4NE



Legend

- ★ Site
- 0m/s to 0.3m/s
- 0.3m/s to 1m/s
- 1m/s to 1.5m/s
- 1.5m/s to 2.5m/s
- >2.5m/s



Information

1. The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.
2. The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring.

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Map Showing the Maximum Flood Depth (combined breach) centred on Station Road, Emneth

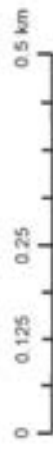
NGR TF4999008682
Ref 238444
Created 09/11/2021

Environment Agency
Bromholme Lane,
Brampton,
Cambridgeshire
PE28 4NE



Legend

- ★ Site
- 0m to 0.25m
- 0.25m to 0.5m
- 0.5m to 1m
- 1m to 2m
- >2m



Information

1. The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.
2. The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring.

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APPENDIX 2

Date	Time (24hr)	Height (m)
2021		
8 Sep	07:57	4.0
9 Sep	08:33	4.3
10 Sep	09:10	4.4
11 Sep	09:50	4.2
7 Oct	07:29	4.3
8 Oct	08:07	4.5
9 Oct	08:48	4.5
10 Oct	09:31	4.2
5 Nov	06:00	4.3
6 Nov	06:44	4.4
7 Nov	07:30	4.3
5 Dec	06:28	4.0

Date	Time (24hr)	Height (m)
2022		
19 Mar	19:10	4.0
20 Mar	19:45	4.2
21 Mar	20:23	4.1
17 Apr	19:43	4.2
18 Apr	20:23	4.3
19 Apr	21:06	4.1
16 May	19:20	4.1
17 May	20:06	4.0
14 Aug	08:40	4.1
15 Aug	09:21	4.2
16 Aug	10:00	4.0
11 Sep	07:39	4.1
12 Sep	08:18	4.3
13 Sep	08:56	4.3
14 Sep	09:33	4.1
28 Sep	08:26	4.2
29 Sep	09:02	4.1
10 Oct	07:15	4.0
11 Oct	07:53	4.2
12 Oct	08:30	4.1
26 Oct	07:23	4.1
27 Oct	08:01	4.2

Note the predicted times and dates of high tides. Be aware that high water may occur at other times, for example, during adverse weather conditions, especially Northerly gales and storms.

Full tide tables may be purchased in stationery outlets.

Note that some tide tables quote height in Chart Datum. This is 2.7m higher than those on here.

Flood Warning Information 2021-22

Emergency Planning Team, Environment & Planning

Borough Council of King's Lynn & West Norfolk, King's Quay, Chapel Street, King's Lynn, Norfolk PE30 1EX
 Tel: 01553 616200 Email: emergency.planning@west-norfolk.gov.uk
west-norfolk.gov.uk @WestNorfolkBC

Introduction

Tidal flooding may occur in some low-lying coastal and river areas when certain bad weather conditions and/or high tides coincide. This is more likely from August through the winter months to April, although it could occur at any time.

Sea defences are in place in West Norfolk but extreme conditions may cause these to be damaged or over topped.

If flooding does occur it may be only for a few hours or it may last a lot longer. In extreme situations you may be asked to leave your property and evacuate to a safe area.

Flood Risks in West Norfolk

The main risk from tidal flooding is to the coast at Hunstanton, Heacham and Snettisham, the town of King's Lynn, West Lynn and the tidal river between Denver and King's Lynn. The risk also extends eastwards along the coastal sea frontage from Hunstanton to Burnham Overy. Other areas are also at risk across the Fens.

In major flood events embankments are put under severe pressure and some overtopping and breaching is possible. If this happens the Environment Agency will issue flood warnings accordingly and a multi-agency emergency response will take place.

In addition to the areas at risk detailed, severe weather may result in localised flood events from surface run-off, in rural and urban areas or blocked culverts, drains and ditches.

Put together an Emergency Kit

If you need to evacuate your home or the power goes off, it is good to have some



essential items to hand that are useful for you. Items to consider include a first aid kit, torch (wind up is best), radio, details of prescription medication, spare glasses, important documents such as passports & insurance documents, supplies for babies or small children or if you have a special diet. Put it all in a box or bag and leave in secure place but is readily accessible if you need it.

How can I contact people?

History has shown that the telephone system may be overloaded particularly mobile phone networks. Calls should be kept short, as the emergency services need the lines for communication. If warnings are issued a pre-arranged meeting point may be beneficial. The meeting point may need to be away from home in a safe area, especially where access may have been restricted.

Bungalows and basements in higher flood risk areas

If you live in either a bungalow, a basement or ground floor flat try to make arrangements in advance to shelter with neighbours who have 'upstairs' accommodation. Leave a message with neighbours or other persons to say where you have gone.

When you receive a flood warning

- Try to stay calm
- Tell your neighbours, especially the elderly or infirm.
- Fasten your outer doors and position your flood boards, and any other flood protection products.
- Use a radio (battery portable or wind up) and continue to listen in to local news updates.
- Try to move your most valuable objects to a place of safety as quickly as possible, or protect them by tying them into plastic bags.
- Switch off gas and electricity.
- Move upstairs if possible
- Take valuables upstairs, if possible
- Keep food, bottled water, medicines, clothes, blankets, torches and candles with you.
- Fill bath, buckets and other receptacles with

water, for washing in case the main supply has to be shut off. Drinking water should be stored in clean bottles or other suitable covered containers for immediate use.

- Remember pets: have a pet carrier, some food and keep pets with you if you have to leave.

If you are flooded in your accommodation

If flooding occurs before you have had time to leave, get people above the water level and keep as dry as possible. Stay where you are and wait for the emergency services to come to you. Hang a large sheet out of a visible window to attract attention.

Hygiene in case of flooding

Protect your health and that of your household by carefully observing basic personal hygiene rules. Always wash hands in clean water before touching food and if in doubt about any food, throw it out. Keep a supply of fresh water available in case mains supply is affected. Keep drinking water in closed containers or bottles for immediate use.

It is particularly important that you do not use any contaminated foodstuffs. Utensils that have been in flood water should be cleaned and boiled (metal utensils for 2 minutes minimum; wood and pottery utensils for 10 minutes minimum) before use.

Calling emergency services

You can help by not calling the Police or other emergency services unless it is absolutely vital.

Insurance cover

If you are advised that you should evacuate, the Borough Council cannot be held responsible for your property and contents during your absence, and although the Police will try to prevent looting, you should secure your home in the best possible manner.

It is important to seek the best possible insurance cover for your home and its contents. Check your existing policies and obtain any extra cover needed - it is too late after a flood. Discuss any claims with authorised assessors only, from recognised insurance companies.

Emergency rest centres

If you are required to evacuate your premises when a flood warning has been given and you have not been able to make arrangements to go to other accommodation, the Local Authority will organise the opening of emergency rest centres as necessary. Please do not go to the rest centres unless you are advised to by the emergency services.

If you are evacuated from your accommodation

Medication
If you are taking any medication, please remember to keep it with you at all times. If you are evacuated, it will not be readily available at the reception centre.

Pets

Keep pets with you, and have a suitable pet carrier available in case you need to transport them. You may take pets with you to the reception centre but any uncaged animals must be kept in a vehicle, or designated compound. Try to arrange a "pet buddy" to look after your pets outside of the affected area.

Bedding and comfort items

If your stay in the rest centre is likely to be prolonged, take a small amount of bedding and food with you, for example a duvet, and crisps, biscuits, chocolate bars. Don't forget nappies for small children.

Financial help

Where there is urgent and immediate need, and help is not available from any other source, the Department of Work and Pensions may be able to help you with:

- cash for food and fuel during the first days of an emergency.
- payments to help replace clothing, household utensils and other essentials.
- payments to people unable to attend work as a result of flooding.

N.B. Any such payments may have to be refunded later - ask when applying.

If other sources of financial aid become available, details will be publicised on the radio and in the local media.

WEST NORFOLK FLOOD WARNING AREAS

Environment Agency Flood Warning Service

The Environment Agency issues specific warnings for flooding from most major rivers and the sea in West Norfolk.

How to find out about flood warnings

If there is a risk that your property may be affected by river and/or coastal flooding the Environment Agency will make every effort to provide advance warning. BUT it is your responsibility to take the appropriate steps to protect yourself and your property.

You can sign up to Flood Warnings online at gov.uk/flood or by dialling 0345 988 1188. Messages can be sent to you via telephone, mobile phone, text or email.

Flood warnings will be broadcast on many local radio stations. The warnings will identify the specific areas affected. If you are concerned that weather conditions may cause flooding, you should listen to:

- BBC Radio Norfolk 104.4 FM 855 & 873 MW
- During major flood events, regional television will also broadcast flood warning information.

Public Safety

People are advised to listen to local radio stations at times of heightened flood risk for more information and not to contact the emergency services for non emergency matters.

If a decision is made that people need to evacuate their homes or premises and go to a safer location eg to relatives or friends out of the affected area, information will be provided via local radio as to the best routes to take and any transport arrangements in place. The locations and opening times of any rest centres in use and any other public safety messages will also be broadcast.

What can I do to be prepared for flooding?

Flood protection products can be fitted to your home or business in advance of any flood event. They can help to minimise the damage caused by flood water. Many can be fitted by a competent DIY person or local trades person.

Further information about suitable products can be found on the National Flood Forum website at nationalfloodforum.org.uk.

The borough council does not issue sandbags, as sandbags on their own are not effective against stopping the ingress of floodwater to properties.

Keep sentimental or important items upstairs (photographs, insurance documents).

Be aware of the flood risk and high tide information for your area.

Do help any of your neighbours who are elderly or infirm to prepare and respond.

Local Sea Defence Funding

In the Heacham, Snettisham & South Hunstanton areas local contributions are required to maintain the existing sea defences. If you want to find out more about contributing please visit west-norfolk.gov.uk/seadefencesfunding.

Just dial **0345 988 1188** using your Floodline Quick Dial Code on the map below to see if there is any flooding in your area.

At the prompt select 1 and then you can use your Quick Dial Code to access the information.



Precautionary Evacuation NOTICE (PEN) - Coast at Snettisham, Heacham and Hunstanton

There are a large number of caravans and properties that lie between the flood embankments on the north west Norfolk coast at Snettisham, Heacham and Hunstanton. If evacuation is required then a great deal of time is needed to complete this task safely. Because of this emergency responders have worked together to put in place specific flood warning evacuation procedures in the area.

If the Environment Agency issue a precautionary evacuation notice (PEN) flood warning for these areas, then additional warning signs will be displayed approaching the area and roads leading to the area that will be closed. Responders will visit the affected properties in the area and caravan sites will carry out their own site evacuations.

Forecasting along this part of the coast is very complex and because of the nature of the defences in the area flooding can occur very quickly. It is important that you follow the instructions given and take action for your own safety.

Clearing up

The emergency services will obviously have a lot to do, so it will help if you keep initial requests to those that are absolutely essential. Requests for assistance when clearing up should be made as follows:-

General Information
Borough Council - 01553 616200 or 01553 616601 out of hours

Checking electrical wiring / power cuts:
UK Power Networks - 105

Checking suspect gas supplies:
National Grid - 0800 111999

These numbers should be used even when gas and electricity are supplied by different companies

Checking suspect water supplies:
Anglian Water - 03457 145 145

Other useful telephone numbers

Flood Warnings - Environment Agency Floodline
0345 988 11 88

Environment Agency Incident Line eg pollution
0800 80 70 60

Welfare Services
Norfolk County Council, Adult and Children Social Services - 0344 800 8020

Financial Aid
Department for Work and Pensions
Under 60 - 0800 055 6688
Over 60 - 0800 991 234

Sewage problems
Anglian Water Services - 08457 145 145



FLOOD ALERT

FLOODING IS POSSIBLE. BE PREPARED



FLOOD WARNING

FLOODING LIKELY TO OCCUR WITH DAMAGE



SEVERE FLOOD WARNING

SEVERE FLOODING. DANGER TO LIFE

If you are in any doubt as to whether you are in a flood risk area, contact the Environment Agency on 0345 988 1188 or visit gov.uk/flood

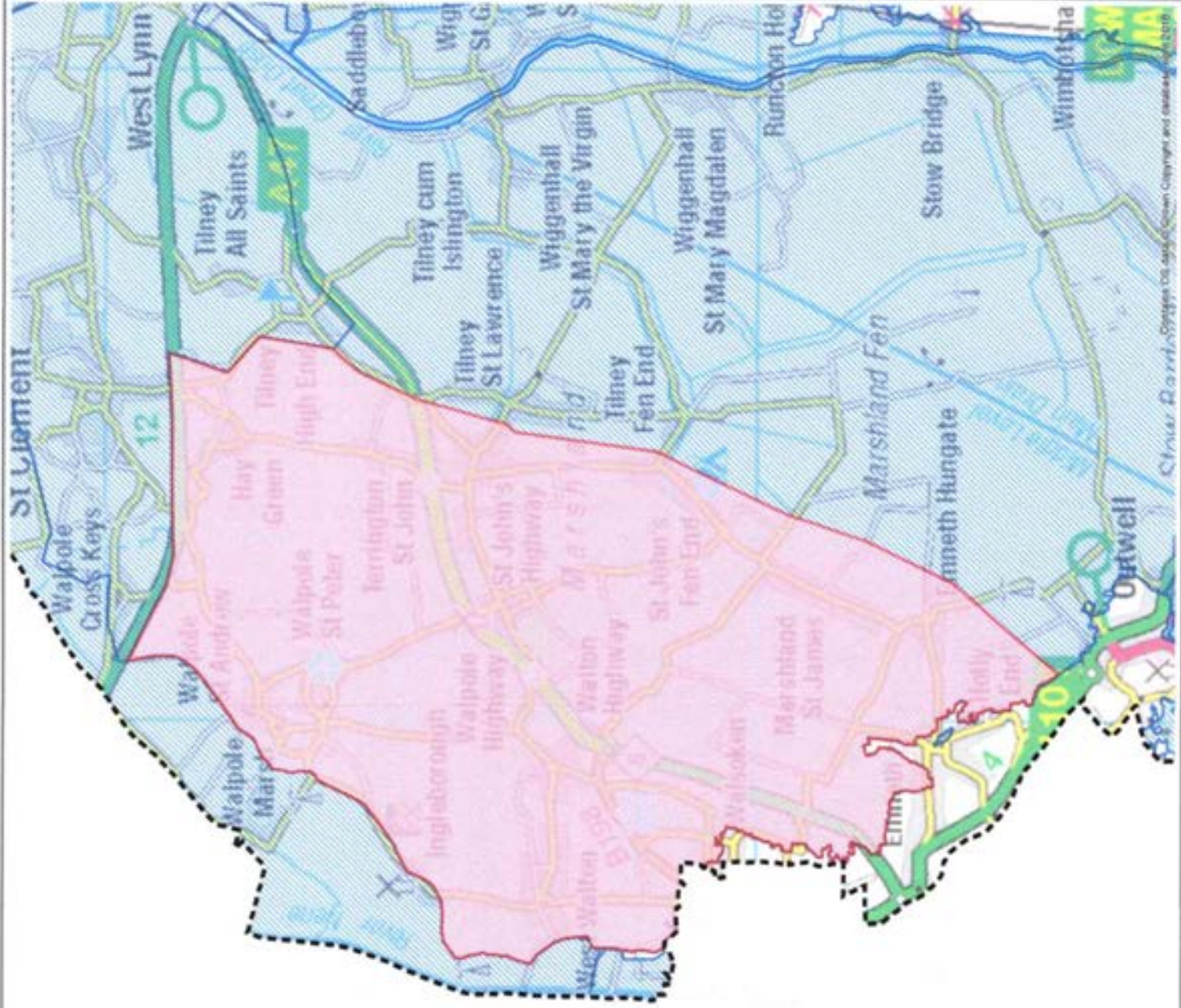
Details about how to be prepared for flooding & other emergencies can be found at norfolkprepared.gov.uk



In the event of flooding:

If you are in immediate danger call 999

If you want to report flooding to highways or properties call 0344 800 8013 or visit norfolk.gov.uk/flooding



Notes

Flood Alerts are used to warn people of the possibility of flooding and encourage them to be alert, stay vigilant and make early preparations. It is issued earlier than a flood warning to give customers advance notice of the possibility of flooding, but before we are fully confident that flooding in Flood Warning Areas is expected.

Flood Warnings warn people of expected flooding and encourage them to take action to protect themselves and their property.

Some areas may be covered by more than one flood warning area as they may be at risk of flooding from more than one watercourse.

Not all Flood Warning Areas may be visible at this scale.

A table, listing the Flood Alerts and Flood Warnings in the borough of King's Lynn and West Norfolk, can be found in the 2017 SFRA. The Flood Warning Area code, shown in the map legend, is provided in the table, alongside a description of the Flood Warning Area name, the watercourse it is associated with and the geographical coverage of the Flood Warning Area.

Key Plan



Legend

- Administrative area (dashed black line)
- Flood Alert Area (light blue shaded area)
- Flood Warning Area Code (pink shaded area)
- 052FWTTRV_BRW3 (pink shaded area)



STRATEGIC FLOOD RISK
ASSESSMENT LEVEL 1

APPENDIX C
FLOOD ALERT AND WARNING COVERAGE

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KING'S LYNN AND WEST NORFOLK
STRATEGIC FLOOD RISK ASSESSMENT

APPENDIX A: FLOOD RISK MAPPING
INDEX GRID: KL_58



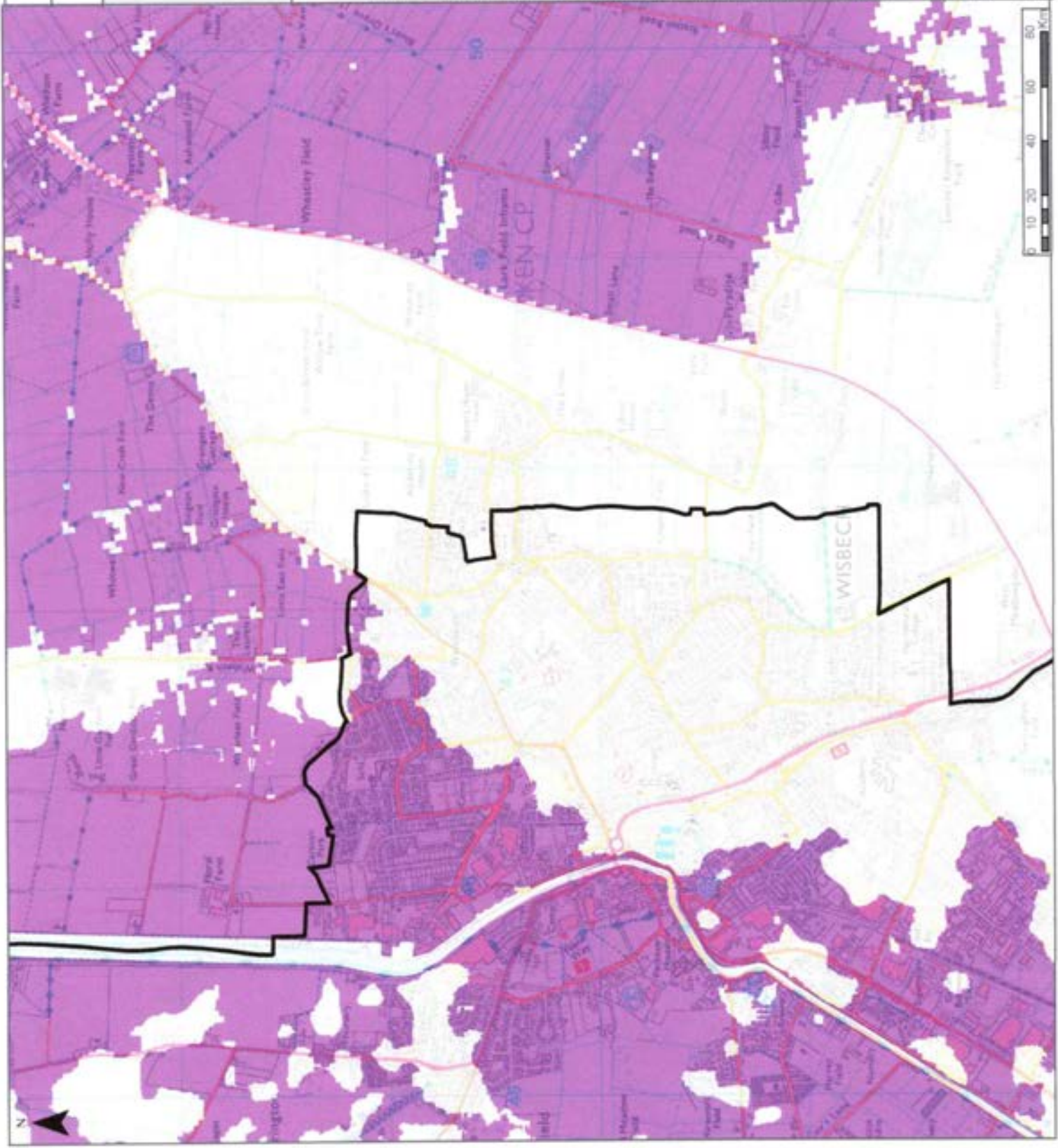
LEGEND

Note: All layers are turned off by default. Click the box next to the layer of interest to turn on.

- Authority Information
 - Administrative Area
 - Study Area
 - Main Rivers
 - Detailed River Network
 - The Breeds
- Flood Zones
 - Flood Zones 3b
 - Indicative Flood Zones 3b
 - Flood Zones 3a
 - Flood Zones 2
- Surface Water
 - RoFROW 3.3% AEP
 - RoFROW 1% AEP
 - RoFROW 0.1% AEP
- Breach
 - Fluvial Breach
 - Total Beach
- Fluvial Climate Change
 - 1% AEP with 35% Climate Change
 - 1% AEP with 65% Climate Change
 - 0.1% AEP with 25% Climate Change
- Total Climate Change
 - 0.5% AEP Climate Change
 - 0.1% AEP Climate Change
- Surface Water Climate Change
 - 1% AEP with 40% Climate Change
- Areas Susceptible to Groundwater Flooding
 - >= 75%
 - >= 50% < 75%
 - >= 25% < 50%
 - < 25%
- Reservoir Flooding
 - Reservoir Flooding
 - Other
 - Dry Islands > 0.5Ha







Return to Index Map

Mapping Supporting Information







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Surface Water

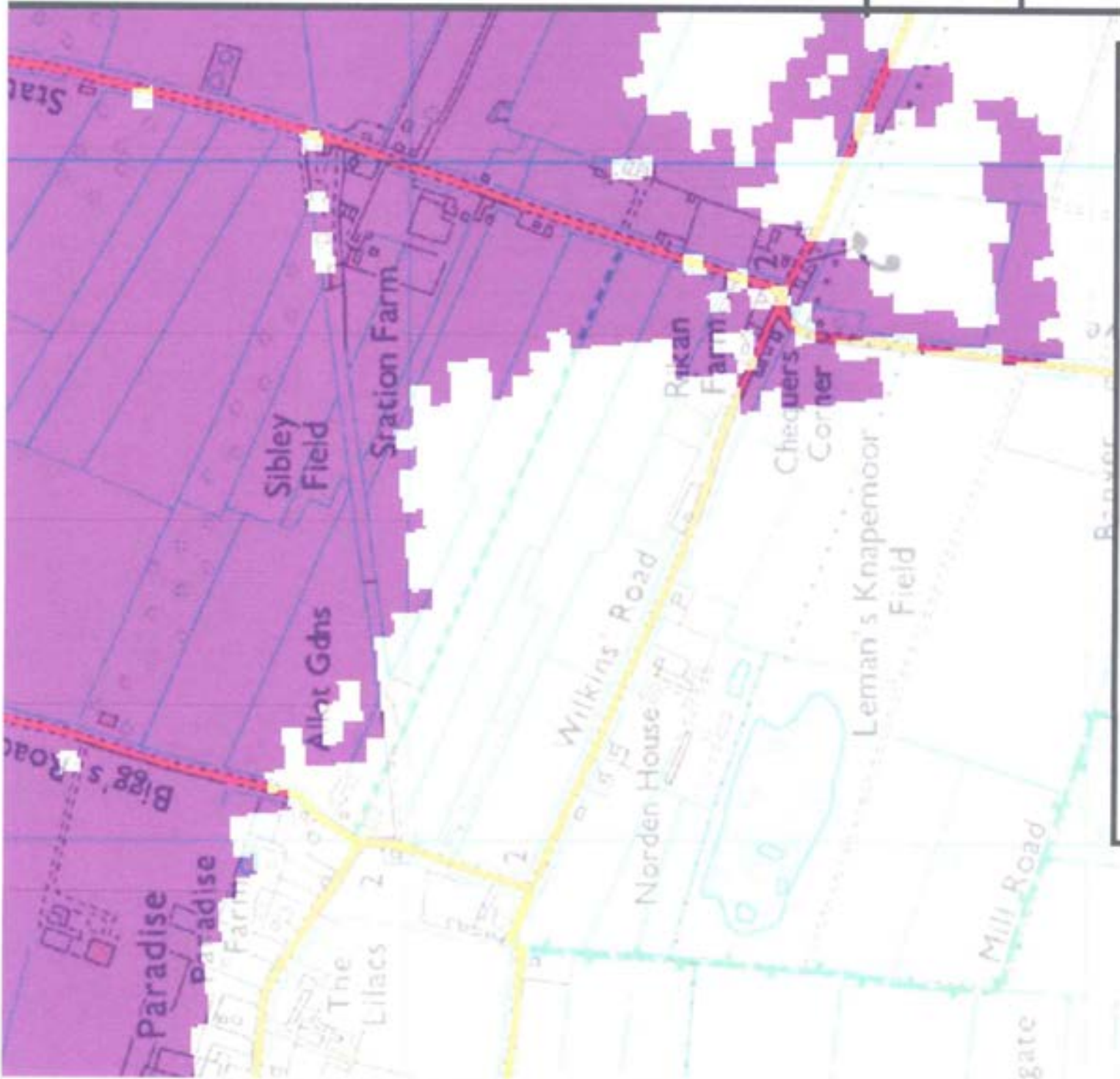
-  RoFfSW 3.3% AEP
-  RoFfSW 3.3% AEP
-  RoFfSW 1% AEP
-  RoFfSW 1% AEP
-  RoFfSW 0.1% AEP
-  RoFfSW 0.1% AEP

Breach

-  Fluvial Breach
-  Fluvial Breach
-  Tidal Breach
-  Tidal Breach

[Return to Index Map](#)

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KING'S LYNN AND WEST NORFOLK
STRATEGIC FLOOD RISK ASSESSMENT

APPENDIX A: FLOOD RISK MAPPING

INDEX GRID: KL_58



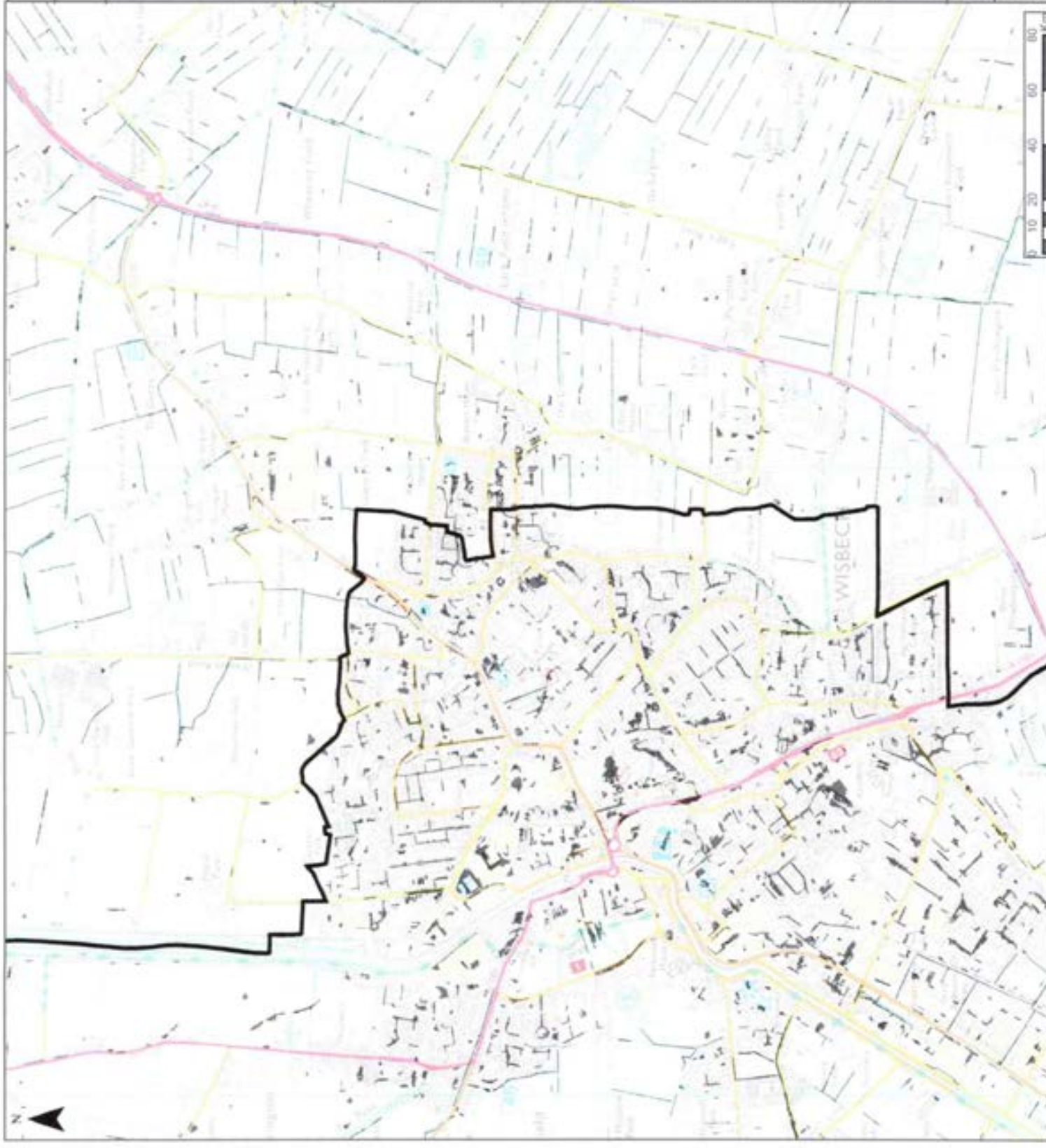
LEGEND

Note: All layers are turned off by default. Click the box next to the layer of interest to turn on.

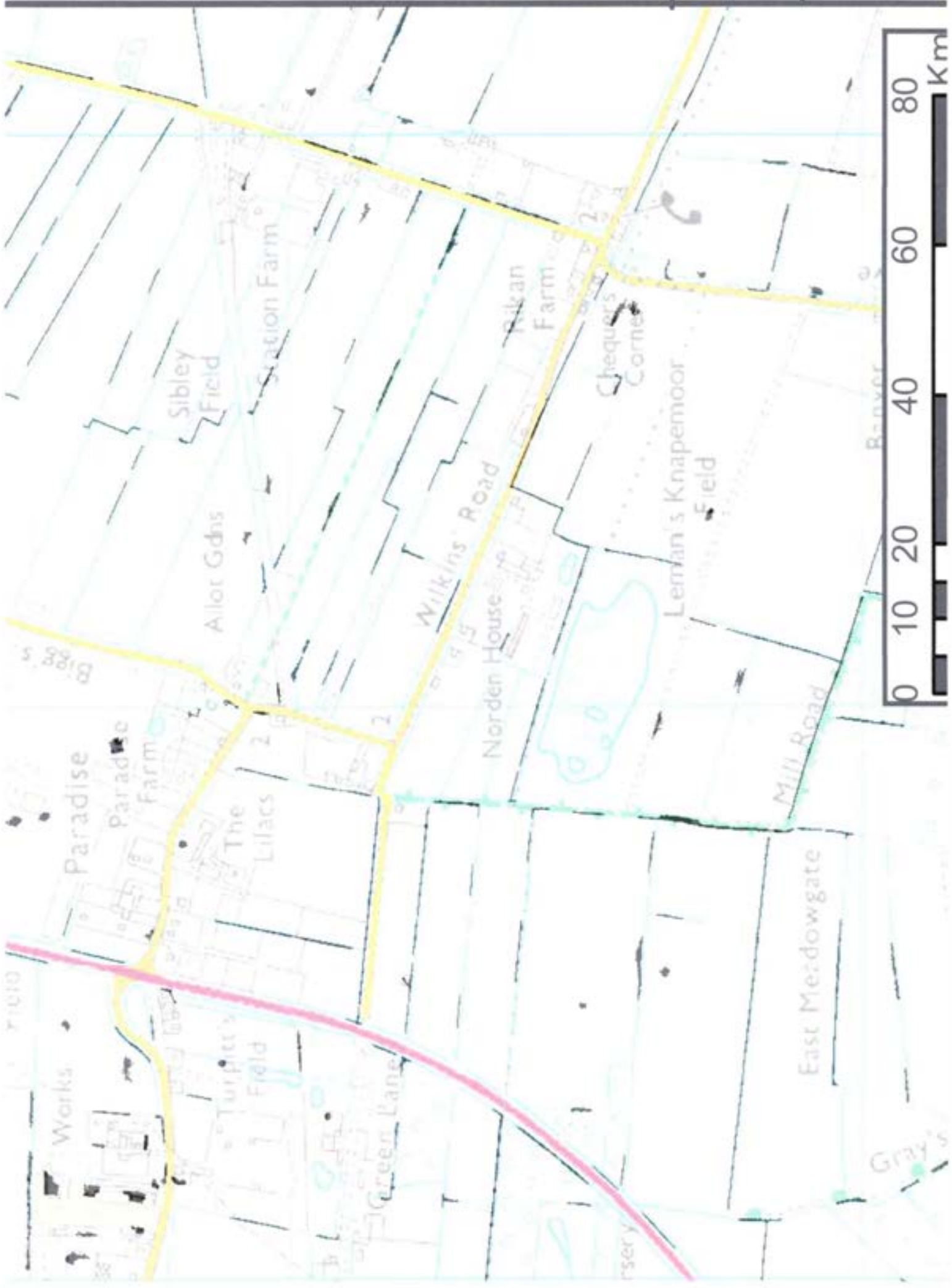
<input checked="" type="checkbox"/> Authority Information	<input type="checkbox"/> Floods: Climate Change
<input checked="" type="checkbox"/> Administrative Area	<input type="checkbox"/> 1% AEP with 35% Climate Change
<input checked="" type="checkbox"/> Study Area	<input type="checkbox"/> 1% AEP with 65% Climate Change
<input type="checkbox"/> Main Rivers	<input type="checkbox"/> 0.1% AEP with 25% Climate Change
<input type="checkbox"/> Detailed River Network	<input type="checkbox"/> Tidal Climate Change
<input type="checkbox"/> The Broads	<input type="checkbox"/> 0.5% AEP Climate Change
<input type="checkbox"/> Flood Zones	<input type="checkbox"/> 0.1% AEP Climate Change
<input type="checkbox"/> Flood Zones 3b	<input type="checkbox"/> Surface Water Climate Change
<input type="checkbox"/> Indicative Flood Zones 3b	<input checked="" type="checkbox"/> 1% AEP with 40% Climate Change
<input type="checkbox"/> Flood Zones 3a	<input type="checkbox"/> Areas Susceptible to Groundwater Flooding
<input type="checkbox"/> Flood Zones 2	<input type="checkbox"/> >= 75%
<input type="checkbox"/> Surface Water	<input type="checkbox"/> >= 50% <75%
<input type="checkbox"/> Ref RW 3.3% AEP	<input type="checkbox"/> >= 25% <50%
<input type="checkbox"/> Ref RW 1% AEP	<input type="checkbox"/> < 25%
<input type="checkbox"/> Ref RW 0.1% AEP	<input type="checkbox"/> Reservoir Flooding
<input type="checkbox"/> Breach	<input type="checkbox"/> Reservoir Flooding
<input type="checkbox"/> Fluvial Breach	<input type="checkbox"/> Other
<input type="checkbox"/> Tidal Breach	<input type="checkbox"/> Dry Islands > 0.5Ha

Return to Index Map

Mapping Supporting Information



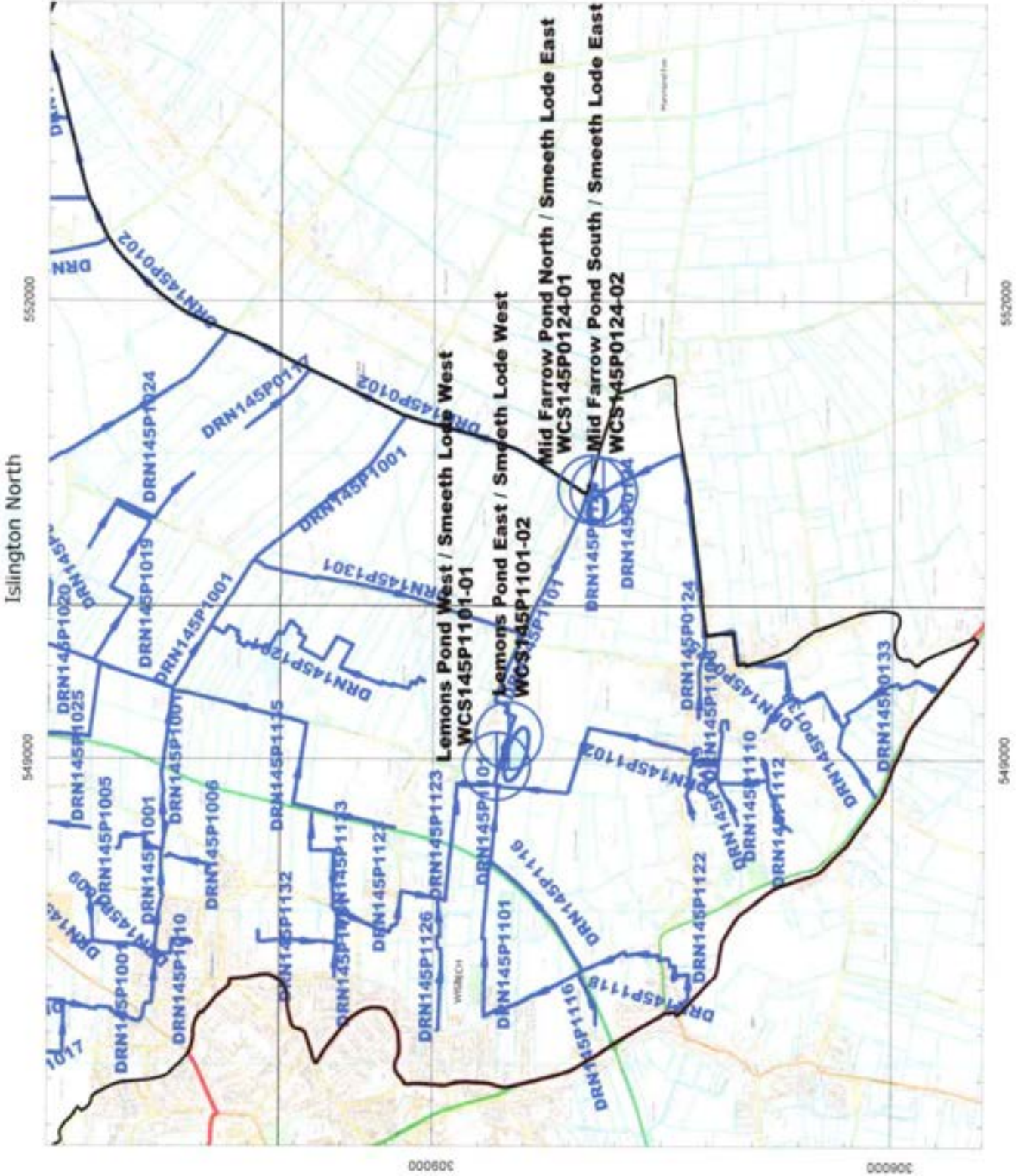
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APPENDIX 3

ISLINGTON SOUTH	
LEGEND	
	- Boards Boundary
	- Hydrological catchment
	- IDB Watercourses
	- Pumping Station
	- Water Control Structure
	- Sluice
KEY MAP	
SCALE	SHEET NUMBER
BEST FIT	<small>© Crown Copyright and database rights 2013. All rights reserved OS Licence number 100020715</small>
PLOT DATE	CMT145P
08/09/2014	
FILE NAME	
KLIDB_webmap2013	

Waltham Farm





Lemmons Pond West / Smeeth

WCS145P1101-01

Lemmons Pond East / Si

WCS145P1101-02

APPENDIX 4



FIND OUT MORE ABOUT THE BOARD →

Home

- [Board's Area](#)
- [Board's Drainage System](#)
- [Board, Members and Officers](#)
- [Filing](#)
- [Organisation](#)
- [Sustainability](#)
- [Energy, Parks and Council Services](#)
- [Operations](#)
- [Risk Management](#)
- [Emergency](#)
- [Development](#)
- [Board Members](#)
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- [Financial Statements](#)
- [Electors](#)
- [History](#)
- [Feedback](#)
- [Links](#)
- [Contact Us](#)
- [Public Notices](#)

Board's Area

The **Drainage Area** includes some of the most rapidly developing conurbations in the country and some of the most fertile arable land in Europe. The area is home to around 100,000 people and a thriving local economy, which is growing fast. The area is both locally and nationally important and worth the cost of defending and protecting, now and in future.

Although the entire area is at considerable theoretical risk of river flooding and inundation from the sea, the actual risk is substantially reduced by the work that we do in partnership with Local Authorities, the Environment Agency and Natural England.

The Board's **Drainage District** does not extend to its **full watershed upstream area**, which means that we find it more difficult to control development and flows coming into the District than we would do if we had some influence in the upper reaches of our catchment. The Board's boundary is based on the principles of the **Waterby Lymne** established in 1933, which in our view needs to be changed so that we can provide an even better service.

Board's Drainage System

The **Drainage, Energy and Waste Asset Management Infrastructure** consists of watercourses, pumping stations and a number of other water level control structures. Our infrastructure can be viewed and downloaded from the **maps** available on our website - just click on the page number that you want. Detailed listings and photographs are also available by clicking on the link shown on our **Board's Area** webpage.

Not all of the defences within our Drainage District are controlled by the Board - the Environment Agency have operational responsibility for the **Main Rivers** and **Coastal Defences**. We have permissive powers to manage the other infrastructure in our Drainage District.

The Board actively maintains only the most critical ordinary watercourses that are not Main River, which equates to around 25% of the total length of ordinary watercourse in the Drainage District. It is therefore vitally important that these watercourses are regularly maintained to design levels, to properly convey flows to the Main Rivers via our pumps and other water level control structures.

It is equally as important to properly maintain the pumping stations and other structures that control the movement of water through the drainage channels. However, the efficiency of our systems and therefore the safety, security and well being of those living and working within our Drainage District is also dependent upon the Environment Agency maintaining the **Main Rivers** and **Coastal Defences**, or permitting others to do so.

Vision, Mission and Values

Our **Vision** is to make the Drainage District and watershed catchment area a safer place to live, work, learn, grow and have fun, as a model of sustainable living in a

KING'S LYNN
Internal Drainage Board

Defenders of Norfolk's Fens

- Most Land Below Sea Level
- Protecting People & Property
- Planning for Next 50 Years
- Drains - Engineering Structures that Provide a Valuable Habitat

Land within King's Lynn
108 Drainage - 11,711 hectares

high flood risk area. Our Mission, strategic aims and corporate values can all be viewed and downloaded from the group's [Business Mission and values](#) webpage.

Policy

Our [Business Plan and Policy Statement](#) sets out the standards of protection we aspire to provide and how we will go about managing risk and water levels, and delivering services in our area. The Board's Business Plan and Policy Statement and most of its tactical and operational policies can be viewed and downloaded from our [Policy](#) webpage.

Organisation

We are able to draw on the local knowledge and experience of our [Board Members](#) who give their time freely to serve you, as custodians of our lowland environment. As a member of the WMA we also have access to the group's [administration, technical support staff and works](#), in addition to the Board's own directly employed staff. For more information please visit our [Organisation](#) webpage.

Governance

The Board provides leadership within a framework of prudent and effective controls, which enables risk to be properly assessed and managed. The Board has put in place a number of plans, policies, procedures and governance arrangements to ensure best value, probity, propriety and transparency in the decision making process. For more info please check-out our [Governance](#) webpage.

Drainage Rates and Special Levies

We have two primary sources of income: the direct rating of all agricultural land and buildings from drainage ratepayers and special levy payments from Local Authorities, which reflect the extent of other property in the Drainage District. The Board sets the rate and special levies each year based on an estimate of its net expenditure, which can be [viewed and downloaded](#) from our website. Our policy is to limit any increases to the Consumer Price Index, as indicated by the [Office for Budget Responsibility](#) for October every year.

Operations

Necessary capital improvement works and regular maintenance of the drainage infrastructure are vitally important services that we provide to help keep King's Lynn Internal Drainage District safe. All of our operations are controlled and financed by the Board directly. We undertake planned maintenance and capital work annually, using a healthy mix of in-house resource and contractors. We're also able to undertake rechargeable work on behalf of [Councils](#) and other third parties. We respond to emergency situations and other events as and when they arise, in accordance with the Board's emergency procedures and scheme of delegation. For more information please visit our [Operations](#) webpage.

Work Programmes

Please check-out our [Work Programmes](#) webpage to identify the maintenance and capital work we plan to deliver.

Emergencies

We provide an emergency service, the extent of which appears to be largely unrecognised. We respond to emergencies during periods of high rainfall and during tidal surge events, utilising our workforce, board membership and state of the art telemetry system. We work closely with other operating authorities and Member Boards in the WMA. We have detailed how we shall respond in an emergency situation on our [Emergencies](#) webpage.

Development

One of the principle services that we provide is regulating, controlling and facilitating [Development](#) to secure the efficient working of the drainage system now and in the future. This is done by reasonable application of the [Drainage Byelaws](#) and the [Land Drainage Act 1961](#), and by working closely with Landowners, Developers, Local Planning Authorities, the Environment Agency and the Lead Local Flood Authority.

Board Members

The Board has a total of 21 members who collectively make the key decisions, 10 of which are elected by occupiers of agricultural land who pay Drainage Rates directly for the services they receive (the elected members), and 11 members are appointed by the constituent Councils to represent the extent of other interests in the Drainage District (the appointed members). The current list of [Board Members](#) and the entitlement of each constituent Council can be viewed and downloaded from our website.

Board Meetings

The Board meets at least 6 times a year at the office in King's Lynn. All Board meetings are public meetings and as such members of the public are welcome to attend the general business sessions. Scheduled meeting dates, notices and agenda are posted on the [Board Meetings](#) page on our website. The confirmed minutes of every Board meeting along with the Report extracts that helped to inform the decision making can also be viewed and downloaded from this webpage.



Financial Statements

The Board's Annual Accounts are audited by its independently appointed external auditor every year and when the auditor has provided their opinion, the financial statements and opinion can be viewed and downloaded from our [Financial statements](#) webpage. The unaudited Annual Accounts are also published every year and are available for inspection prior to audit on our [Public Notice](#) webpage.

Elections

Elections for membership of the Board are held every 3 years, so if you're not happy with our performance you have the opportunity to do something about it, either by exercising your vote as a drainage ratepayer or standing for election yourself. For more information please visit our [Elections](#) webpage.

History

The Board and its predecessors have been very successful in reducing flood risk over the years, with a pedigree of over 250 years in the business. So successful in fact, that many people living and working in the area know nothing of the Internal Drainage Board and the vital work that we do to help prevent flooding and facilitate land use. Our success is inevitably measured by what does not happen rather than what does happen, which means that if flooding does not occur frequently then the value of what we do is sometimes questioned. But it is precisely because we continually maintain, improve and watch over the drainage system that we are actually able to reduce the risk of flooding. For more information please visit our [History](#) webpage.

Feedback

To help us better serve you, please let us know how we're doing by completing a [Customer Feedback Form](#). It is recognised that we don't always get it right first time, so if you need to [complain](#) please give us a call. If this does not resolve your complaint, please complete our [Complaint Form](#) and send it to us by email to info@idb.org.uk. Alternatively you can print it out, complete the form and return it to our central office, the address of which is shown on the [Home page](#).

Links

In addition to the [IPFA web site](#), you may also find the sites on our [Links](#) page useful.

Contact us

You can contact us during office hours at the King's Lynn office, details of which appear on the group's [Home page](#) and [Contact us page](#). Out of hours contact details are shown on our own [Contact](#) webpage.

Public Notices

Generally, all notices that we're legally obliged to advertise are published on our [Public Notices](#) webpage. Project updates and other news can be accessed from our [Facebook page](#) and by following us on [Twitter](#).



Contact details

01329 434200
01329 434201
01329 434202
01329 434203
01329 434204
www.idb.org.uk

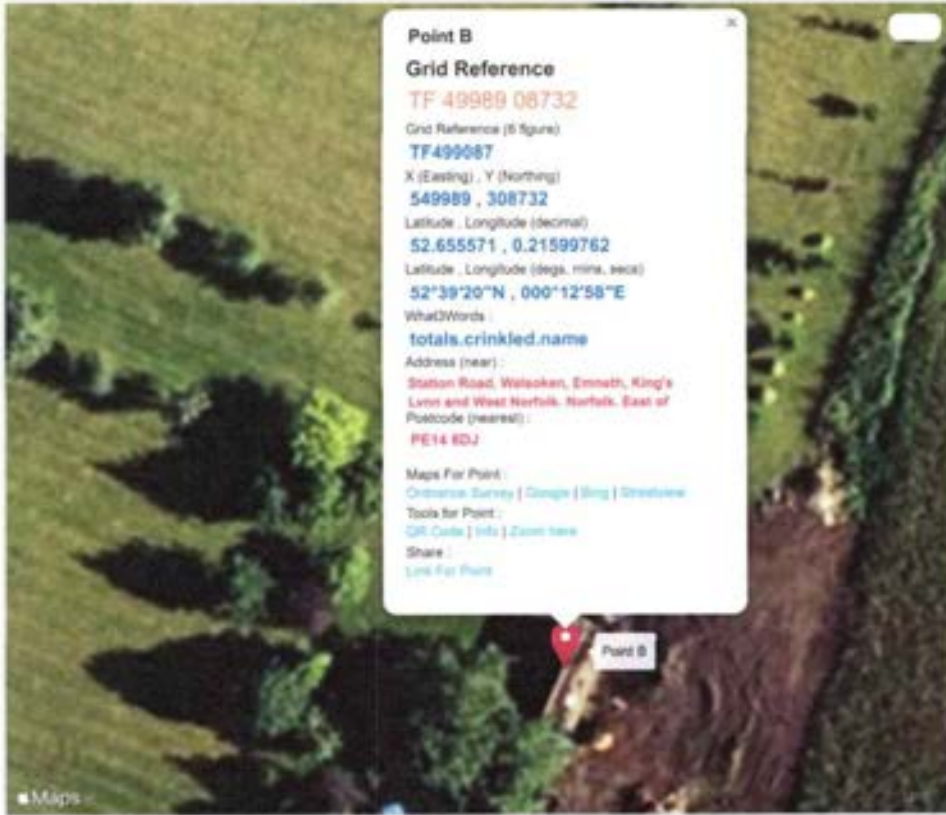
Internal Drainage Board, King's Lynn
PO Box 1000, King's Lynn, Norfolk, PE33 0SR

Out of hours

01329 434200
www.idb.org.uk
www.idb.org.uk
www.idb.org.uk
www.idb.org.uk

APPENDIX 5

UK Grid
Reference Finder



Grid Reference	X (Easting)	Y (Northing)	Latitude	Longitude	Description (Click to Edit)	Address
TF 49941 08885	549941	308885	52.656872	0.21538006	PE14 8DJ	
TF 49989 08732	549989	308732	52.655571	0.21599762	Point B	Station Road, Walsoken, Emneth, King

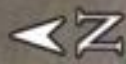
Postcode	Link	Center	Zoom	Style (click to change)	Show	Delete
PE14 8DJ						
PE14 8DJ						

PE14 8DJ

Write a description for your map.

PE14 8DJ

Legend



400 m

Google Earth

© 2021 Google





Maison Cube

Works Site Boundary
Works Site Boundary

No.	Description (Planning Ref App)	Date
1		16/03/2022

Mr & Mrs Sutton
Barn Conversion

Site/Location
Plan-Proposed

Project number	F01
Date	13/04/2022
Drawn by	WJS
Checked by	WJS

A1-01

Scale
As indicated



3 Location Plan-Proposed
1 / 1250

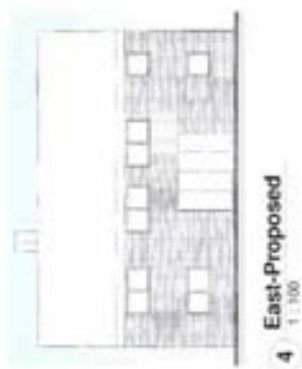


2 Site Plan-Proposed
1 / 500



No.	Description (Planning No. App.)	Date
1		14/05/2022

Mr & Mrs Sutton	
New Dwelling	
Plans-Proposed	
Project number	F01
Date	13/04/2022
Drawn by	WJS
Checked by	WS
Scale	A1-06 As indicated



4 East-Proposed
1:100



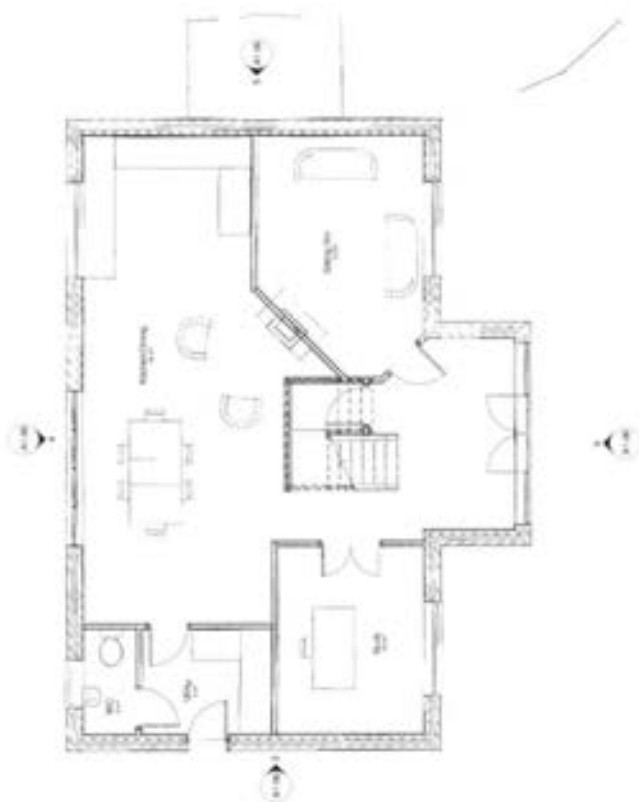
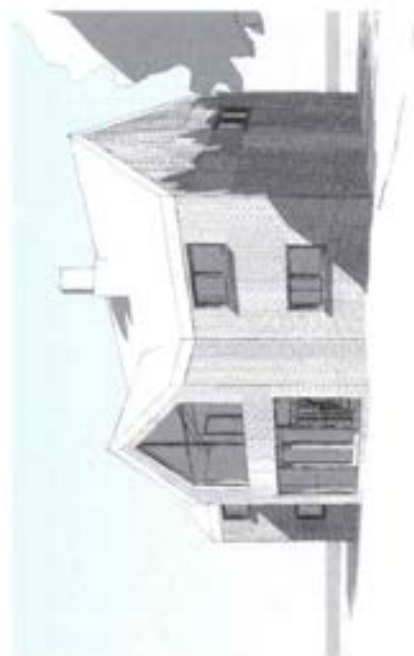
6 West-Proposed
1:100



3 North-Proposed
1:100



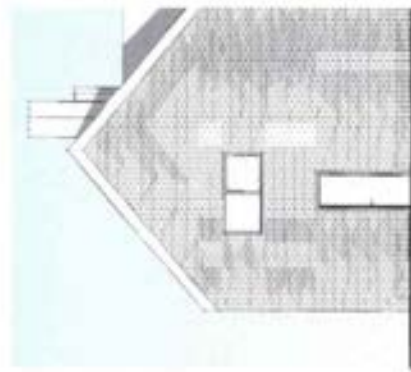
5 South-Proposed
1:100



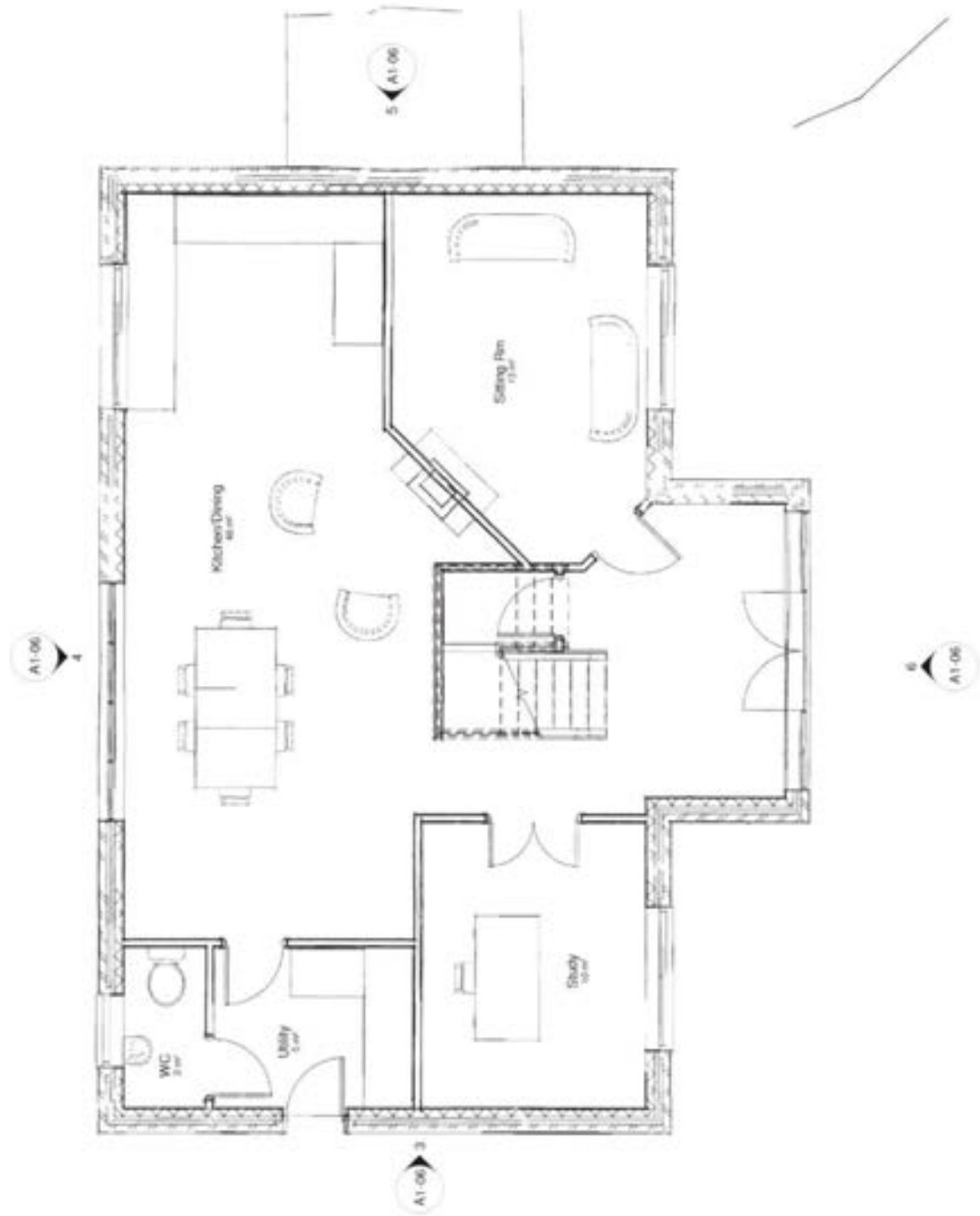
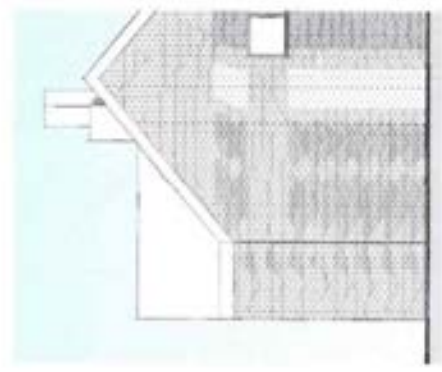
1 Ground Floor Level-Proposed
1:50



2 Roof Level-Proposed
1:50



3 North-Proposed
1 : 100



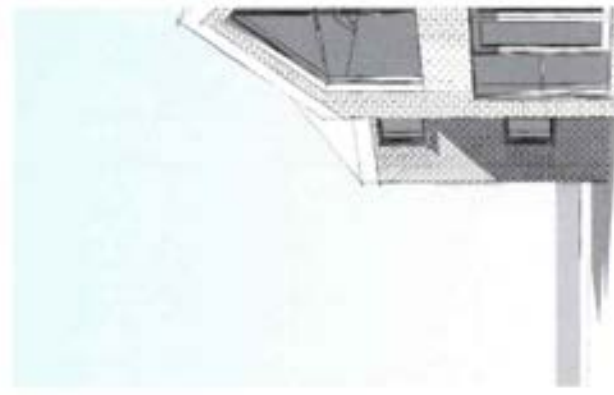
1 Ground Floor Level-Proposed

1 : 50



5 South-Proposed

1 : 100



2 Roof Level-Proposed

1 : 50

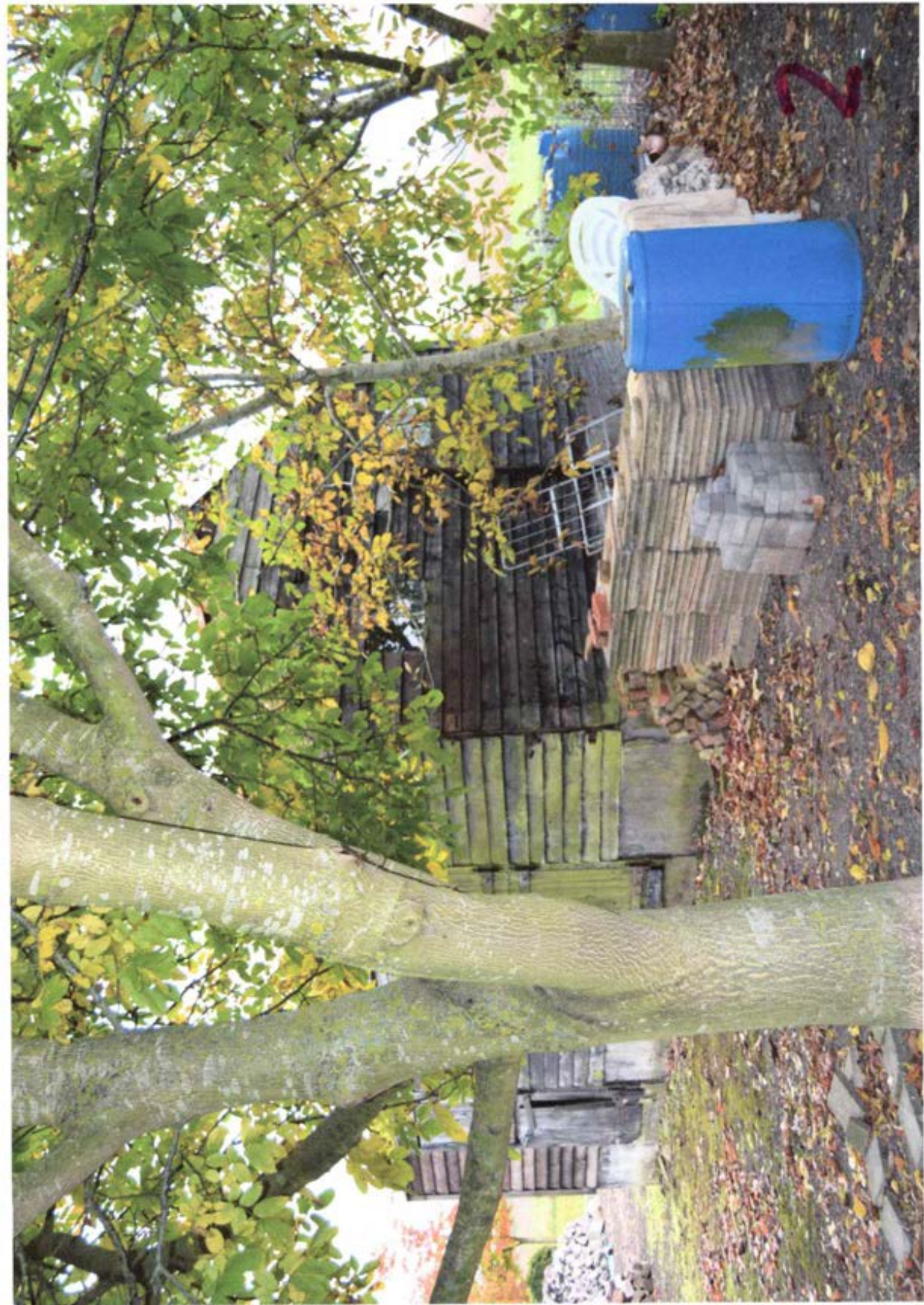
APPENDIX 6

9NW

Proloster Access
STATION RD

1











APPENDIX 7

APPENDIX C1: Proforma for Sequential and Exception Tests
(required for all sites, regardless of level of flood risk)

1	Site name and reference	LAND ADJACENT NO1 POPEHOLE COTTAGES, EMNETH PE14 8DJ.	
	Date of completion	01/07/22	
	Completed by	BEN HORNIBLOW (ESP LTD)	
2	The site is affected by (Please tick all that apply)		
	Flood Zone 3a	<input checked="" type="checkbox"/>	Residual risk (Max Depth)
	Flood Zone 3b	<input type="checkbox"/>	The Coastline (within 100m)
	Flood Zone 2	<input type="checkbox"/>	Climate Change (Fluvial)
	Fluvial/ tidal/ sea flooding/ other	<input type="checkbox"/>	Climate Change (Tidal)
	Surface Water Flooding	<input type="checkbox"/>	Climate Change (Surface Water)
	A watercourse passing through/ next to site (within 20m)	<input type="checkbox"/>	Other matters e.g. dry islands, reservoir flood risk, groundwater risk
3	Development type	RESIDENTIAL DWELLING	
4	Vulnerability to flooding (see Table 1-2)	MORE VULNERABLE	
5	Sequential Test Declaration:		
	<p>If the site is at flood risk you must demonstrate how you have considered suitable and reasonable available alternative locations at lower flood risk. You must also demonstrate why these alternatives are not suitable given wider planning considerations.</p> <p>Ownership or land owner agreement in itself is not acceptable as a reason not to consider alternatives.</p> <p style="text-align: center;">(Continue on a separate sheet if required)</p>		
6	Flood risk assessment/surface water drainage strategy: Please attach this to this proforma*		
	<p>Please confirm that the design of site will meet the flood risk design standard guidance and that the surface water drainage strategy conforms to the requirements of Norfolk County Council as LLFA</p> <p>YES/NO</p> <p>If not, please provide a further explanation</p>		

7 Where the Exception Test Applies

Please provide evidence that the development is needed for wider sustainability reasons and where possible helps to reduce risk to the wider community.

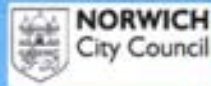
N

A .

(Continue on a separate sheet if required)

* Flood Risk Assessments are required for sites over 1 hectare and all sites in Flood Zones 2 and 3. Surface Water Drainage Strategies are required for all major developments.

Where sites in Flood Zone 1 are at risk from other sources of flooding, a Flood Risk Assessment will also be required. The SFRA can be used to help identify the sources of flooding that may affect a development site to scope the need for and content of a Flood Risk Assessment.



King's Lynn and West Norfolk Strategic Flood Risk Assessment

Final Report: Level 1

November 2018





JBA Project Manager

Hannah Coogan
The Library
St Philips Courtyard
Church Hill
COLESHILL
Warwickshire
B46 3AD

Revision History

Revision Ref / Date Issued	Amendments	Issued to
Draft rev 1.0 / Sept 2017	DRAFT for comment	SFRA Steering Group
Final Draft rev 2.0 / Aug 2018	FINAL DRAFT for comment	SFRA Steering Group
Final rev 3.0 / Nov 2018	FINAL report	SFRA Steering Group

Contract

This report describes work commissioned on behalf of a consortium of local planning authorities in Norfolk:

- Broadland District Council
- Great Yarmouth Borough Council
- Borough Council of King's Lynn and West Norfolk
- Norwich City Council
- North Norfolk District Council
- South Norfolk Council
- Broads Authority

Each authority was represented as part of a steering group for the SFRA. The steering group's representative for the contract was North Norfolk's Policy Team Leader, Iain Withington. Sophie Dusting, Ffion Wilson, Freyja Scarborough and Roberta Whittaker of JBA Consulting carried out this work.

Prepared by Roberta Whittaker BSc PGCert
Assistant Analyst

..... Sophie Dusting BSc MEPS
Analyst

Reviewed by Alastair Dale BSc PGDip MIAHR
Technical Director

..... Hannah Coogan BSc M. CIWEM C.WEM
Technical Director



Purpose

This document has been prepared as a Final Draft Report for the Borough Council of King's Lynn and West Norfolk. JBA Consulting accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared.

JBA Consulting has no liability regarding the use of this report except to the Client.



Acknowledgements

We would like to acknowledge the assistance of:

- All the commissioning authorities;
- The Lead Local Flood Authority (Norfolk County Council);
- Environment Agency;
- Internal Drainage Boards (Downham Market Group of IDBs, East Harling IDB, Middle Level Commissioners, Water Management Alliance, Waveney IDB);
- Anglian Water;
- Highways England; and,
- Planners at the neighbouring authorities and LLFAs

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JBA is aiming to reduce its per capita carbon emissions.



Executive Summary

Introduction

Norfolk Local Planning Authorities (LPAs) have a long track record of cooperation and are working together on strategic cross-boundary planning issues, through the Norfolk Strategic Framework. One of the aims of the framework is to inform the preparation of future Local Plans, through shared objectives and strategic priorities.

Strategic Flood Risk Assessments (SFRAs) form part of the evidence base of the Local Plan and can be used to inform the Sustainability Appraisal. The requirement for the preparation of SFRAs is detailed in Section 14 Paragraph 156 of the **National Planning Policy Framework (NPPF)**.

A consortium of Norfolk LPAs, comprising Broadland District Council, Great Yarmouth Borough Council, the Borough Council of King's Lynn and West Norfolk, North Norfolk District Council, Norwich City Council, South Norfolk Council and the Broads Authority, have commissioned new Level 1 SFRAs to inform strategic planning decisions, the preparation of Local Plans and to inform development management decisions. These councils are local planning authorities for their respective administrative areas, with the exception of the Broads Executive Area, where the Broads Authority is the Local Planning Authority.

The Level 1 SFRAs comprise the following four reports:

- 2017 Greater Norwich Area SFRA, covering the Norwich City Council, Broadland District Council, South Norfolk Council and parts of the Broads Authority administrative areas
- 2017 North Norfolk SFRA covering the North Norfolk District Council and parts of the Broads Authority administrative areas
- 2017 Great Yarmouth SFRA covering the Great Yarmouth Borough Council and parts of the Broads Authority administrative areas
- 2018 King's Lynn and West Norfolk SFRA covering the Borough Council of King's Lynn and West Norfolk

Within this 2018 SFRA report, when reference is made to the '*combined study area*' and this is the whole area covered by the four reports listed above.

The 2018 SFRA document replaces the previous King's Lynn and West Norfolk SFRA originally published in 2008. The main purpose of the 2018 SFRA is to inform the selection of options for the Local Plan allocations and support determination of planning applications for King's Lynn and West Norfolk Borough.

SFRA objectives

The key objectives of the 2018 Strategic Flood Risk Assessment are:

- To provide up to date information and guidance on flood risk for King's Lynn and West Norfolk Borough, taking into account the latest flood risk information and the current state of national planning policy;
- To determine the variations in risk from all sources of flooding in King's Lynn and West Norfolk Borough, taking into account climate change;
- To identify the requirements for site-specific flood risk assessments;
- To consider opportunities to reduce flood risk to existing communities and developments;
- To enable the Borough Council of King's Lynn and West Norfolk to apply the Sequential Test;
- To aid the Borough Council of King's Lynn and West Norfolk in identifying when the Exception Test is required and when a more detailed Level 2 SFRA will be required, when determining strategic site allocations; and,
- To inform the Sustainability Appraisal of the Borough Council of King's Lynn and West Norfolk Local Plan, so that flood risk is taken into account when considering strategic site allocations.



SFRA outputs

This report fulfils the Level One SFRA requirement.

To meet the objectives, the following outputs have been prepared:

- Assessment of all potential sources of flooding (see Sections 5 and 6)
- Assessment of the potential impact of climate change on flood risk (see Sections 4 and 5)
- Mapping of all potential sources of flooding including climate change (see Appendix A)
- Mapping of location and extent of functional floodplain (see Appendix A)
- Mapping of "dry islands" (see Appendix A)
- Assessment of standard of protection provided by existing flood risk management infrastructure (see Section 7)
- Mapping of areas covered by Environment Agency Flood Warnings (see Section 6.10.2 and Appendix C)
- Review of opportunities to reduce flood risk to existing communities and development (see Section 10)
- Guidance for developers including requirements for site-specific flood risk assessments and general advice on the requirements and issues associated with Sustainable Drainage Systems (SuDS) (see Sections 8 and 9)
- Recommendations of the criteria that should be used to assess future development proposals and the development of a Sequential Test and sequential approach to flood risk (see Section 3).

Summary of the SFRA

Appraisal of flood risk

- There have been a number of recorded flood incidents across the Borough, from a combination of sources. The predominant source of flooding is from tidal sources, although recent flooding has been largely from surface water. Under Section 19 of the Flood and Water Management Act, Norfolk County Council in their role as Lead Local Flood Authority, have published two reports within the Borough of King's Lynn and West Norfolk; one investigation concerning the event on 6th November and 23rd December 2012 at Sutton Road, Walpole Cross Keys and another investigation concerned the rainfall events that caused 42 properties to flood in the Borough between early June and late November 2014. Section 19 reports are available to download from Norfolk County Council's [website](#). A total of 47 flood incidents along the A47 highway have been recorded since July 2008, by Highways England. Most recently, surface water flooding affected the Borough in July 2018. Historic flooding is discussed further in Section 6.1.
- Fluvial flooding is one of the primary sources of flood risk within the Borough of King's Lynn and West Norfolk. The most significant watercourse in terms of fluvial risk is the River Great Ouse; however, there are several other watercourses that pose a significant risk. Due to their low-lying elevations, many settlements across the Fens area are at risk of flooding from watercourses that are substantially influenced by high tide levels. In addition, fluvial/tidal flooding also gives rise to the risk of flooding in the event of overtopping / breach from embanked watercourses that are higher than the adjacent land. As water levels in the Fens area are heavily managed by Internal Drainage Boards (IDBs), a mechanical or structural failure of engineering installations such as land drainage pumps, sluice gates, lock gates, outfall flap valves etc. or their support infrastructure (i.e. power supplies in the case of drainage pumps) could exacerbate flooding. Fluvial flooding is discussed further in Section 6.4.
- The low-lying areas in the west and south of the Borough that belong to the Fens are highly susceptible to tidal flooding. The actual tidal flood risk within the Great Ouse catchment is generally considered to be low, due to the defences in place and the standard of protection provided. Tidally influenced water levels have the potential to rise over embankments and inundate the land behind them in the Nene catchment. The greatest risk related to tidal flooding in the Borough would be if a spring tide coincided with a major storm surge event.



Tidal flood defences are essential to preventing the inundation of the Fens and with them a significant portion of the study area. Tidal flooding is discussed further in Section 6.5.

- Coastal erosion is a predominant process along Hunstanton Cliffs causing potential threats to settlements and coastal defences. The emerging **Hunstanton Coastal Management Plan** will address these issues by defining a plan to manage the coastline at a local level. The (2010) **North Norfolk Shoreline Management Plan (SMP)** covering Hunstanton to Kelling and the (2010) **The Wash SMP** covering Gibraltar Point to Old Hunstanton describe the high level strategy and coastal policies. It should be noted that the policies described in the SMPs do not always focus on the "hold the line" approach. For example, at Hunstanton Cliffs, in the short and medium term the strategy of no active intervention will be used, allowing the cliffs to erode naturally. Section 2.9 outlines the SMP strategies in the Borough and coastal flood risk is discussed further in Section 6.6.
- Watercourses in IDB districts are managed for water level and flood risk management. There are 18 IDBs which operate in the Borough of King's Lynn and West Norfolk; the IDBs are administered by four organisations: Downham Market Group of Internal Drainage Boards, Ely Group of Internal Drainage Boards, Middle Level Commissioners and Water Management Alliance. The full list of IDBs in the Borough is contained in Section 2.12.4; the coverage of IDB districts is shown in Appendix B. The IDB policy statements on flood protection and water level management have been used to determine the general standard of flood protection provided to each IDB District:
 - Downham Market Group: The policy statements for **Downham and Stow Bardolph, the East of Ouse, Polver and Nar, the Northwold, the Southery and District, the Stoke Ferry and Stringside** IDBs state that the board seeks to maintain a general standard of protection for agricultural land and developed areas of 1 in 20-years and 1 in 100-years respectively. The policies acknowledge that the likely return period cannot be taken literally and should be considered as a chance of some over-spilling from the system taking place each year as being 5% and 1% respectively.
 - The Ely Group of Internal Drainage Boards: The **Burnt Fen policy statement** and the **Littleport and Downham policy statement** state that, the board seeks to maintain for agricultural land and developed areas of land, a standard of protection of 1 in 20-years and 1 in 100-years respectively. The policies acknowledge that the return period cannot be taken literally and should be considered as a chance of some over spilling from the system taking place each year as being 5% and 1% respectively.
 - Middle Level Commissioners: The **Churchfield and Plawfield, Euximoor, Hundred Foot Washes, Hundred of Wisbech, Manea and Welney, Needham and Laddus, Nordelph and Upwell** policy statements provide varying standards of protection levels and should be referred to separately.
 - Water Management Alliance: The **King's Lynn IDB policy statement** and the **Norfolk Rivers IDB policy statement** states that the Boards will seek to maintain a general standard of protection against flooding of 1 in 10-years with 600mm of freeboard to agricultural land and 1 in 100-year with 300mm freeboard to developed areas. The policy statement acknowledges that the standards cannot be taken literally and that some over-spilling from the systems may occur during these events.
- The Risk of Flooding from Surface Water (RoFfSW) dataset shows that surface water predominantly follows topographical flow paths of existing watercourses or dry valleys, with some isolated ponding located in low-lying areas. The Stage 1 **King's Lynn and West Norfolk Settlements Surface Water Management Plan (SWMP)** initially addressed several localities that had suffered surface water flooding or carry a high surface water flood risk. The Stage 2 work focused on producing surface water flood risk mapping for the four highest priority areas: King's Lynn, Downham Market, Heacham and Snettisham. The SWMP identified six critical drainage catchments in King's Lynn, two critical drainage catchments at Downham Market and a critical drainage catchment at Wimbotsham, Snettisham and Heacham. Surface water flood risk is discussed further in Section 6.7.
- Groundwater plays a role in coastal erosion, as water within the rock strata can create instabilities within coastal cliffs. The Areas Susceptible to Groundwater flooding (ASfGWf) dataset shows that areas more susceptible to groundwater flooding are generally



associated with the valleys of watercourses and along coastline areas. The ASStGW dataset is shown in Appendix A. Due to the characteristics of The Wash and the underlying Chalk features there is the potential for groundwater flooding. The lowest lying areas however tend to be the Fens and are highly managed, so it is reasonable to assume that the pumping infrastructure operated by the Internal Drainage Board maintains a low water table. This reduces the probability of groundwater flooding. Groundwater flooding is discussed further in Section 6.8.

- Historical incidents of flooding are detailed by Anglian Water in their sewer flooding register. This database records incidents of flooding relating to public foul, combined or surface water sewers and identifies which properties suffered flooding. A total of 118 recorded flood incidents have been identified on the sewer flooding register for the Borough of King's Lynn and West Norfolk. Flood risk from sewers is discussed further in Section 6.9.1.
- There are no records of flooding from reservoirs impacting properties inside the study area. Flood risk from reservoirs is discussed further in Section 6.9.2 and is mapped in Appendix A.
- Currently there are 14 Flood Alert Areas and 31 Flood Warning Areas (FWAs) covering the study area. Mapping showing the coverage of the Flood Alert Areas and FWAs is provided in Appendix C.
- A high-level review was undertaken to identify the main settlements where flood risks / extents are more prominent; this is shown in Table 6-6. If a settlement is not listed in this table this does not mean that the settlement is not at flood risk. The mapping provided in Appendix A can be used as a high-level screening exercise, to identify whether a location or site has a potential risk of flooding.
- The mapping of all potential sources of flooding including climate change is provided in Appendix A.

Climate change

The NPPF and accompanying Planning Practice Guidance set out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. The Environment Agency published **updated climate change guidance** on 19 February 2016 (further updated on 3 February 2017), which supports the NPPF and must now be considered in all new developments and planning applications. UK Climate Predictions are currently being updated and are due for release in late 2018. Following this, the Environment Agency guidance will be updated.

The climate change allowances used in the Strategic Flood Risk Assessment are detailed in Sections 4 and 5. Climate change modelling for watercourses and coastal areas across the combined study area was undertaken where detailed models exist and were available and supplied at the time of preparing this SFRA. Where existing detailed models were not re-run and mapped for climate change, this is documented in Appendix D. Further details and guidance for developers is contained in Section 4 and 8. The mapping of all potential sources of flooding including climate change is provided in Appendix A.

Flood defences

There are a number of Environment Agency assets throughout King's Lynn and West Norfolk Borough. The assets comprise a mixture of embankments, dunes, bridge abutments, demountable defences, walls and Flood Storage Areas. The standard of protection provided by these assets varies, as does the condition. The flood risk analysis in Section 7 indicates that much of the Borough is heavily dependent on flood defences to protect settlements from flooding, particularly from tidal / coastal sources. For example, the 2015 breach modelling of the Great Ouse shows that significant areas of the Borough of King's Lynn and West Norfolk are at risk should the defences breach.

Further information on flood defences and schemes in the Borough is provided in Section 7. Mapping showing the location, type and condition flood defences across the Borough is provided in Appendix E; this also displays the design standard of protection offered by the defences.

Development and flood risk

The Sequential and Exception Test procedures for both Local Plans and Flood Risk Assessments (FRAs) are documented in Section 3, along with guidance for planners and developers throughout



the report. Links are provided to various relevant guidance documents and policies published by other Risk Management Authorities, such as the LLFA and the Environment Agency.

Dry Islands

Dry islands can present specific hazards, primarily the provision of safe access and egress during a flood event. The results show that there are 564 dry islands in the Borough of King's Lynn and West Norfolk. These are mainly in the southern and western areas of the Borough and a few dry islands cross administrative boundaries into neighbouring districts.

Dry islands are discussed in Section 6.10.3; this section expands further on the assumptions used to map dry islands and further considerations. Dry islands are mapped in Appendix A.

Relevant studies

There are many relevant regional and local studies which complement the SFRA and have been considered, such as the Catchment Flood Management Plan, River Basin Management Plan, the Preliminary Flood Risk Assessment, Local Flood Risk Management Strategies and SMPs. Other policy considerations have also been incorporated, such as sustainable development principles, climate change and flood risk management. Relevant policy is discussed in Section 2 and policy considerations have been referenced throughout the report.

Policy Recommendations

The following policy recommendations are to be considered by the Borough Council of King's Lynn and West Norfolk in the development of the Local Plan.

Development and planning considerations

Sequential approach to development

It is recommended that the sequential approach is adopted for all future developments within the Borough of King's Lynn and West Norfolk.

New development and re-development of land should wherever possible seek opportunities to reduce overall level of flood risk at a site.

Sequential and Exception tests

The SFRA has identified that areas of King's Lynn and West Norfolk Borough are at high risk of flooding from tidal, coastal, fluvial and surface water sources. Therefore, proposed development sites will be required to satisfy the Sequential and, where necessary, Exception Tests in accordance with the NPPF. The Borough Council of King's Lynn and West Norfolk should use the information in the 2018 SFRA when deciding which development sites to take forward in their Local Plan.

Site-specific Flood Risk Assessments

Local Planning Authorities should steer all development to Flood Zone 1 and take a sequential approach to development. If this is not possible, developers should, where required, undertake more detailed hydrological and hydraulic assessments of the watercourses to verify flood extent (including latest climate change allowances), to inform the sequential approach within the site and prove, if required, whether the Sequential and Exception Tests are satisfied (for windfall sites not included in the plan evidence on the Sequential Test must be submitted in FRAs).

The Flood Zones, whilst generally accurate on a large scale, are not provided for land where the catchment of the watercourse falls below 3km². There are a number of small watercourses and field drains which may pose a risk to development. Therefore, whilst these smaller watercourses may not be shown as having flood risk on the flood risk mapping, it does not necessarily mean that there is no flood risk. As part of a site-specific FRA the potential flood risk and extent of flood zones should be determined for these smaller watercourses. The Risk of Flooding from Surface Water map can be a useful starting point for identifying floodplains in small catchments.

Where a site-specific FRA has produced modelling outlines which differ from the EA's Flood Map for Planning (Rivers and Sea) then the model can be submitted to the EA for an Evidence Based Review. Where the modelling and results are deemed acceptable to the EA, amendments to the Flood Map for Planning (Rivers and Sea) may take place.

Where the watercourses are embanked, the effect of overtopping and breach must be considered and appropriately assessed.



All new development within the 1% Annual Exceedance Probability (AEP) flood extent including an allowance for climate change (for the lifetime of the development) must not normally result in a net loss of flood storage capacity. Annual Exceedance Probability is the probability (expressed as a percentage) of a flood event occurring in any given year. Where possible, opportunities should be sought to achieve an increase in the provision of floodplain storage. Where proposed development results in a change in building footprint, the developer should ensure that it does not impact upon the ability of the floodplain to store or convey water and seek opportunities to provide floodplain betterment. Similarly, where ground levels are elevated to raise the development out of the floodplain, compensatory floodplain storage within areas that currently lie outside the floodplain should normally be provided to ensure that the total volume of the floodplain storage is not reduced.

There are a number of guidance documents which provide information on the requirements for site-specific FRAs:

- **Standing Advice on Flood Risk (Environment Agency);**
- **Flood Risk Assessment for Planning Applications (Environment Agency);** and,
- **Site-specific Flood Risk Assessment: CHECKLIST (NPPG, Defra).**

The Environment Agency has also produced a guidance document called "Flood risk assessment: Climate Change allowances" which details the application of current climate change allowances and local considerations in East Anglia. This document, alongside other flood risk guidance, is available from: <https://www.norfolk.gov.uk/rubbish-recycling-and-planning/flood-and-water-management/information-for-developers>.

Developers are further advised to refer to policies DM 18 and DM 21 in the **Site Allocations and Development Management Policies Plan**. This details requirements for sites located in coastal flood risk hazard zone (Hunstanton to Dersingham) as defined in the Council's Policies Map (DM 18) as well as for sites in areas at risk of flooding (DM 21). Developers should note that changes may have been made to these policies since the publication of this document and that they should seek the most up to date guidance to refer to. Developers are also advised to consult the Council's webpage called: "**Information for planning agents**" which provides further information on flood risk and design guidance.

Developers should consult with the Borough Council of King's Lynn and West Norfolk, Norfolk County Council, the Environment Agency, Anglian Water and, where necessary, relevant IDBs at an early stage to discuss flood risk including requirements for site-specific FRAs, detailed hydraulic modelling, and drainage assessment and design. If applications cross administrative boundaries, the neighbouring LLFAs, Suffolk County Council, Cambridgeshire County Council and Lincolnshire County Council may need to be approached.

Further guidance for developers can be found in Section 8.

Surface water management and SuDS

- Developers should consult Norfolk County Council's guidance for developers: Norfolk County Council, **Lead Local Flood Authority, Statutory Consultee for Planning, Guidance Document (2017)**. The guidance provides information on how SuDS proposals for new developments will be considered by the LLFA, when to consult the LLFA, how to screen applications based on local flood risk and records, LLFA standing advice (for Ordinary Watercourse consenting, major development below LLFA thresholds and minor development), the levels of information required for planning applications and technical guidance. The technical guidance is split into the following themes:
 - Local flood risk guidance
 - Drainage hierarchy
 - Infiltration testing guidance
 - Runoff rates
 - Runoff volumes
 - Climate change
 - Management and maintenance
 - Flood exceedance management
- Planners should be aware of local conditions and requirements set by either the Downham Market Group of IDBs, Ely Group of IDBs, Middle Level Commissioners or the Water



Management Alliance. Further details regarding their policies for development and SuDS can be found on their websites:

- <http://www.downhammarketidbs.org.uk>
 - <http://www.elydrainageboards.co.uk>
 - <https://middlelevel.gov.uk/>
 - <https://www.wlma.org.uk/>
- Developers who wish to have their SuDS schemes considered for adoption by Anglian Water should refer to the **Anglian Water SuDS Adoption Manual**¹. Anglian Water also expect national guidance (i.e. **the CIRIA C753 SuDS Manual**) to be referred to in addition to Anglian Water's guidance.
 - It should be demonstrated through a Surface Water Drainage Strategy, that the proposed drainage scheme, and site layout and design, will provide an appropriate standard of protection from surface water flooding to properties and critical infrastructure from flooding from surface water both on and off site. A detailed site-specific assessment of SuDS would be needed to incorporate SuDS successfully into the development proposals. All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post-development runoff. The 2015 **DEFRA non-statutory technical standards for sustainable drainage systems** should be followed, alongside the LLFA guidance note and national guidance.
 - For proposed developments, geotechnical investigations should be undertaken to determine whether the ground at the site has infiltration potential. This information should be representative of on-site conditions. If the ground at the site is found to have infiltration potential, detailed infiltration testing should be undertaken in line with BRE 365 to establish representative infiltration rates. The LLFA have published information relating to infiltration tests within their **guidance document**.
 - A number of Groundwater Source Protection Zones have been identified throughout King's Lynn and West Norfolk Borough (see Section 9.4.1). Where sites lie within or close to aquifers (see Section 6.2), treatment steps may be required ahead of discharge to the ground, sewers etc. Development proposals at sites across the area should assess the pollution risk to receiving waterbodies and include appropriate treatment steps ahead of any discharge to surface or groundwaters. The CIRIA C753 SuDS manual provides further guidance on this issue.
 - A management and maintenance plan of sustainable drainage and surface water systems covering the lifetime of the development will be required. Consideration must also be given to the residual risks associated with the use of SuDS.

Further information on surface water and SuDS is provided in Section 9.

Council review of planning applications

The Council should consult the Environment Agency's **'Flood Risk Standing Advice (FRSA) for Local Planning Authorities'**, last updated 15 April 2015, when reviewing planning applications for proposed developments at risk of flooding. The Council will consult the relevant statutory consultees as part of the planning application assessment and they should also contact non-statutory consultees (e.g. IDBs or Anglian Water) that have an interest in the planning application.

Infrastructure and safe access

Finished floor levels and safe access and egress

Finished floor level guidance has been established through consultation with the Environment Agency.

Minimum finished floor levels for development should be above whichever is higher of the following:

- a minimum of 600mm above the 1% AEP fluvial event plus an allowance for climate change.
- a minimum of 600mm above the 0.5% AEP tidal event plus an allowance for climate change.

¹ At the time of preparing this SFRA, Anglian Water's current manual is expected to be revised to take account of national guidance published after the manual and Anglian Water's position regarding health and safety matters associated with open SuDS features.



- 300mm above surrounding ground levels

A 300mm freeboard is only applicable where detailed modelling is available which is deemed to be reliable. If no detailed and reliable modelling is available, the Environment Agency may require a 600mm freeboard to be applied when setting minimum finished floor levels.

There is specific design flood level guidance relating to the application and use of the Tidal Hazard Mapping Models for the River Nene and River Great Ouse (see Section 8.2.6) which considers the impact of a breach of tidal defences. Developers are advised to consult the flood design guidance relating to the application and use of this modelling on the Council webpage called: **"Information for planning agents"**.

With regards to LLFA guidance and surface water flood risk, finished floor levels are recommended to be set to a minimum of 300mm above the 1% AEP plus an allowance for climate change flood levels (including anticipated flood levels within the drainage system). If there is an uncertainty in flood levels, the freeboard level should be increased from 300mm to 600mm. The LLFA would also expect a minimum of at least 150mm freeboard between proposed external ground levels and the property finished floor level. Further information can be found in the **LLFA guidance document**.

Safe access and egress to a locally identified refuge area will need to be demonstrated at all development sites. Ideally, waterproof construction techniques used. If safe access and egress to a locally identified refuge area cannot be achieved, the **Defra/EA Technical Report: FD2320: Flood Risk Assessment Guidance for New Development** should be referred to, to determine the hazard to people posed along the access route. This can also be used to inform a Flood Warning and Evacuation Plan for the site. Emergency vehicular access should be possible during times of flood.

Resistance and resilience measures will be required if buildings are situated in the flood risk area, and as applicable in all cases of flood risk, opportunities to enhance green infrastructure and reduce flood risk by making space for water should be sought. Further information is provided in Section 8.5 and 8.6 and in the publications **"Improving the flood performance of new buildings"** and **"Prepare your property for flooding."**

Local requirements for finished floor levels should be discussed with the LPA, LLFA and EA taking into account the individual circumstances of the application.

Dry islands

It is recommended that emergency planners at the local authorities review the outputs of the 2018 SFRA and the areas identified as being located in a dry island. A site-specific Flood Risk Assessment and / or Flood Warning and Evacuation Plan may be required if a proposed development is located within a dry island (even for sites less than 1 hectare and in Flood Zone 1).

Residual risk

Residual risk is the risk that remains after mitigation measures are considered. The residual risk includes the consideration of flood events that exceed the design thresholds of the flood risk management measures or circumstances where there is a failure of defences, e.g. flood banks collapse, reservoir failure etc. The flood risk analysis in Section 7 and Appendix E demonstrates that much of the Borough is heavily dependent on flood defences to protect settlements from flooding. The Environment Agency breach model extents covering the King's Lynn and West Norfolk Borough show that residual risk from breach is significant. This risk is especially relevant in the west of the Borough and comes from both fluvial and tidal sources. Residual risks should be considered as part of site-specific Flood Risk Assessments.

Where the watercourses are embanked, the effect of overtopping and breach must be considered and appropriately assessed. There is specific guidance relating to the application and use of the Tidal Hazard Mapping Models for the River Nene and River Great Ouse (see Section 8.2.6) which considers the impact of a breach of tidal defences. Developers are advised to consult the flood design guidance relating to the application and use of this modelling on the Council webpage called: **"Information for planning agents"**.

Further, any developments located within an area protected by flood risk management measures, where the standard of protection is not of the required standard, or where the failure of the intended level of service gives rise to unsafe conditions, should be identified and appropriate responses prepared, as necessary.



Future flood management in the Borough of King's Lynn and West Norfolk

Green Infrastructure and Water Framework Directive

Developments should demonstrate opportunities to create, enhance and link green assets. Development that may adversely affect green infrastructure assets should not be permitted.

Strategic flood risk solutions

The information provided in the SFRA should be used as a basis for investigating potential strategic flood risk solutions within the Borough of King's Lynn and West Norfolk (see Section 10 for further information). Opportunities could consist of the following:

- Future improvements and maintenance of existing flood defences;
- Catchment and floodplain restoration;
- Flood storage areas;
- Opening up culverts, weir removal, and river restoration; and
- Green infrastructure.

Cross-boundary partnership working

For successful future flood risk management, it is recommended that local planning authorities adopt a partnership working approach to flood risk management and consider the cumulative impact of development within a catchment.

Use of Strategic Flood Risk Assessment data

SFRAs are high-level strategic documents and, as such, do not go into detail on an individual site-specific basis. The 2018 SFRA has been developed using the best available information, supplied at the time of preparation, taking into account the latest flood risk information and the current state of national planning policy. This relates both to the current risk of flooding from fluvial, tidal, pluvial, groundwater, sewers and reservoirs as well as the potential impacts of future climate change. It is this data that guidance singles out as the most appropriate for forward planning.

At the time of writing, this report was developed using the best available information. However, the 2018 SFRA should be a '**living document**' and as a result should be updated when new information on flood risk, flood warning or new planning guidance or legislation becomes available. The Environment Agency regularly reviews their hydrology, hydraulic modelling and flood risk mapping, and it is important that they are approached to determine whether updated (more accurate) information is available prior to commencing a site-specific FRA. The information used in this SFRA is detailed in Appendix D.

Please note that the Environment Agency are in the process of updating the River Burn model. This model is due for completion in late 2018 and developers should request the latest information from the Environment Agency.

Level 2 SFRA

A separate Level 2 SFRA has been undertaken and is available from the Borough Council. This considers the site risk at a community level in more detail and is intended to be used to apply the Sequential and Exception Tests at planning allocation stage.



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APPENDIX 8

Sustainable drainage systems

Sustainable drainage systems (SuDS) are designed to manage stormwater locally (as close its source as possible), to mimic natural drainage and encourage its infiltration, attenuation and passive treatment.

SuDS are designed to both manage the flood and pollution risks resulting from urban runoff and to contribute wherever possible to environmental enhancement and place making. With this in mind, the multi-functionality and multiple benefits of SuDS should always be considered.

Key Principles

SuDS essentially operate through infiltration where possible and attenuation combined with slow conveyance. Many SuDS solutions employ a combination of infiltration and attenuation. Situations where infiltration is not an option, for example because of the soil type or contamination, tend to favour attenuation type SuDS.

Good SuDS design should follow the SuDS philosophy, which calls for the inclusion of a number of key principles:

1. A management train – using a number of SuDS components in series and characterising areas into land use and drainage type
2. Source control – managing runoff as close as possible to where it falls as rain
3. Managing water on the surface – wherever possible, runoff should be managed on the surface
4. Early and effective engagement – consider the use of SuDS at the earliest stages of site selection and design.

Good practice with attenuation and slow conveyance type SuDS is to use 'soft engineered' surface features rather than underground storage and to align the conveyance train with exceedence flood routing.

When SuDS are used in new developments with highways or retrofitted in existing developed areas where there is also highway drainage, the highway drainage arrangements will generally be a key theme which shapes the form of the SuDS. This is because highway run-off often forms a high percentage of the total run-off from developed areas and is also the surface water element that contains the highest level of pollutants.

Benefits of SuDS

Sustainable drainage systems (SuDS) mimic natural drainage processes to reduce the effect on the quality and quantity of run-off from developments and provide amenity and biodiversity benefits. When specifying SuDS, early consideration of potential benefits and opportunities will help deliver the best results.

The benefits of SuDS include:

- flood risk management – reducing the risk of flooding from development
- water quality management – reducing the impact of diffuse pollution
- improving amenity and biodiversity – the integration of green infrastructure with SuDS solutions can help to create habitat, recreational and biodiversity areas
- water resources – SuDS can help to recharge groundwater supplies and capture rainwater for re-use purposes
- community benefits – attractive, well designed public open space that incorporate SuDS can help to create better communities through social cohesion and quality of life improvements
- recreation – multi-purpose SuDS components can not only manage surface water, but also act as sports/play areas
- education – SuDS in schools provide a fantastic learning opportunity whilst also providing additional recreational space
- enabling development – SuDS can help to free up capacity in already established drainage networks, and the provision of SuDS can often be a prerequisite of planning permission.

Recent revisions to planning policy and the National Planning Policy Framework recognise the role that well-designed SuDS have in managing surface water.

More about the benefits of SuDS and their application. [\[http://www.susdrain.org\]](http://www.susdrain.org) – Susdrain website

APPENDIX 9

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Guidance

Flood risk and coastal change

Advises how to take account of and address the risks associated with flooding and coastal change in the planning process.

From:

[Department for Levelling Up, Housing and Communities \(/government/organisations/department-for-levelling-up-housing-and-communities\)](/government/organisations/department-for-levelling-up-housing-and-communities) and [Ministry of Housing, Communities & Local Government \(/government/organisations/ministry-of-housing-communities-and-local-government\)](/government/organisations/ministry-of-housing-communities-and-local-government)

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- [Site-specific flood risk assessment](#)

Related content

- [Flood risk assessment in flood zone 1 and critical drainage areas \(/guidance/flood-risk-assessment-in-flood-zone-1-and-critical-drainage-areas\)](/guidance/flood-risk-assessment-in-flood-zone-1-and-critical-drainage-areas)
- [Review individual flood risk assessments: standing advice for local planning](#)

followed are set out below which, in summary, are designed to ensure that if there are better sites in terms of flood risk, or a proposed development cannot be made safe, it should not be permitted.

See [related policy \(https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para155\)](https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para155).

Assess flood risk:

- Local planning authorities undertake a [Strategic Flood Risk Assessment](#) to fully understand the [flood risk](#) in the area to inform [Local Plan preparation](#)
- In [areas at risk of flooding](#) or for sites of 1 hectare or more, developers undertake a [site-specific flood risk assessment](#) to accompany applications for planning permission (or [prior approval for certain types of permitted development](#)).

Avoid flood risk:

- In plan-making, local planning authorities apply a [sequential approach](#) to site selection so that development is, as far as reasonably possible, located where the risk of flooding (from all sources) is lowest, taking account of climate change and the vulnerability of future uses to flood risk. In plan-making this involves applying the [‘Sequential Test’ to Local Plans](#) and, if needed, the [‘Exception Test’ to Local Plans](#).
- In decision-taking, where necessary, local planning authorities also apply the [‘sequential approach’](#). In decision-taking this involves applying the [Sequential Test for specific development proposals](#) and, if needed, the [Exception Test for specific development proposals](#), to steer development to areas with the lowest probability of flooding.

Manage and mitigate flood risk:

- Where development needs to be in locations where there is a risk of flooding as alternative sites are not available, local planning authorities and developers ensure development is appropriately [flood resilient and resistant](#), [safe](#) for its users for the development’s [lifetime](#), and will not increase flood risk overall.
- Local planning authorities and developers should seek [flood risk management opportunities](#) (eg safeguarding land), and to reduce the causes and impacts of flooding (eg through the use of [sustainable drainage systems](#) in developments).

This guidance on flood risk and coastal change will help local planning authorities in the preparation of [Local Plans](#), and neighbourhoods in preparing [neighbourhood plans](#). It will also be relevant to [applications for planning permission](#) and applications for prior approval for certain types of [permitted development](#).

There is information on the [requirements to consult the Environment Agency](#) on applications where there is a risk of flooding. Also information on what should happen if a local planning authority wishes to grant consent for a major development [against Environment Agency advice](#).

- [Applying the Sequential Test to individual planning applications](#)
- [Applying the Exception Test to planning applications](#)
- [Demonstrating that the wider sustainability benefits to the community outweigh flood risk to satisfy the first part of the Exception Test](#)
- [Developers to demonstrate that development will be safe to satisfy the second part of the Exception Test](#)
- [How local planning authorities should involve the Environment Agency when determining planning applications where there is a risk of flooding](#)
- [How the local planning authority should involve the lead local flood authority when determining planning applications, and what advice should be given about local flood risks](#)
- [What is meant by "minor development" in relation to flood risk](#)
- [The flood risk issues raised by minor developments](#)
- [The flood risk issues raised by changes of use](#)
- [Permitted development rights and flood risk](#)
- [Reducing the causes and impacts of flooding](#)
- [Making development safe from flood risk](#)
- [Flood resilience and flood resistance](#)
- [Neighbourhood planning](#)
- [Flood Zone and flood risk tables](#)
- [Site-specific flood risk assessment: Checklist](#)
- [Other considerations](#)
- [Proximity to main rivers](#)
- [What is the general planning approach to development and coastal change?](#)
- [Why it is important to apply Integrated Coastal Zone Management](#)
- [Coastal Change Management Areas](#)
- [Permitted development rights in areas at risk from coastal change](#)

[authorities \(/guidance/flood-risk-assessment-local-planning-authorities\)](#)

- [Flood risk assessment: the sequential test for applicants \(/guidance/flood-risk-assessment-the-sequential-test-for-applicants\)](#)
- [Flood resilient construction of new buildings \(/government/publications/flood-resilient-construction-of-new-buildings\)](#)
- [Flood risk assessment in flood zones 2 and 3 \(/guidance/flood-risk-assessment-in-flood-zones-2-and-3\)](#)

Collection

- [Planning practice guidance \(/government/collections/planning-practice-guidance\)](#)

Where plans are being prepared under the transitional arrangements set out in Annex 1 to the revised [National Planning Policy Framework](#) (<https://www.gov.uk/government/publications/national-planning-policy-framework--2>), the policies in the [previous version of the framework published in 2012](#) (<http://webarchive.nationalarchives.gov.uk/20180608095821/https://www.gov.uk/government/publications/national-planning-policy-framework--2>) will continue to apply, as will any previous guidance which has been superseded since the new framework was published in July 2018. If you'd like an email alert when changes are made to planning guidance please [subscribe](#) (<https://www.gov.uk/topic/planning-development/planning-officer-guidance/email-signup>).

Planning and flood risk

What is the general planning approach to development and flood risk?

The National Planning Policy Framework sets strict tests to protect people and property from flooding which all local planning authorities are expected to follow. Where these tests are not met, national policy is clear that new development should not be allowed. The main steps to be

There is information on the role of [lead local flood authorities](#) and when their advice may need to be sought in [considering planning applications](#).

There is information on flood risk in relation to [minor developments](#) and [change of use](#), whilst information on climate change and flood risk is available from the [Environment Agency \(https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances\)](https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances).

See also:

- [What is "flood risk"?](#)
- [What are the "areas at risk of flooding" mentioned in paragraph 155 of the National Planning Policy Framework?](#)

Paragraph: 001 Reference ID: 7-001-20140306

Revision date: 06 03 2014

What is "flood risk"?

For the purposes of applying the National Planning Policy Framework, "flood risk" is a combination of the probability and the potential consequences of flooding from all sources – including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.

Paragraph: 002 Reference ID: 7-002-20140306

Revision date: 06 03 2014

What are the 'areas at risk of flooding' mentioned in paragraph 155 of the National Planning Policy Framework?

For the purposes of applying the National Planning Policy Framework, areas at risk from all sources of flooding are included. For fluvial (river) and sea flooding, this is principally land within Flood Zones 2 and 3. It can also include an area within Flood Zone 1 which the Environment Agency has notified the local planning authority as having critical drainage problems.

[Table 1](#) sets out the definitions of the Flood Zones, from low to high probability of river and sea flooding, and refers to the Environment Agency's Flood Map for Planning (Rivers and Sea) which shows the location of these Flood Zones. This map and maps showing other sources of flooding are available from the Environment Agency.

Paragraph: 003 Reference ID: 7-003-20140306

Revision date: 06 03 2014

Taking flood risk into account in the preparation of Local Plans

This is summarised in [Diagram 1: taking flood risk into account in the preparation of a Local Plan](#) (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/574832/flood1_005.pdf) (PDF, 561KB, 1 page)

Paragraph: 004 Reference ID: 7-004-20140306

Revision date: 06 03 2014

Notes to diagram 1:

- [Read more about Strategic Flood Risk Assessment](#)
- [View guidance on Sustainability Appraisal](#)
(<https://www.gov.uk/guidance/strategic-environmental-assessment-and-sustainability-appraisal>)
- [View diagram 2: Application of the Sequential Test for Local Plan preparation](#)
- [View diagram 3: Application of the Exception Test to Local Plan preparation](#)
- [Read more about the sequential test](#)
- [Read more about the exception test](#)

See also:

- [Which flood risk management bodies should local planning authorities seek advice from when preparing Local Plans?](#)
- [Is flood risk relevant to Local Plan policies that change the use of land or buildings?](#)
- [Is flood risk relevant to waste and minerals plans?](#)

Paragraph: 005 Reference ID: 7-005-20140306

Revision date: 06 03 2014

Which flood risk management bodies should local planning authorities seek advice from when preparing Local Plans?

[Paragraph 156 of the National Planning Policy Framework](https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para156) (<https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para156>) states that local planning authorities should take advice from the Environment Agency and other relevant flood risk management bodies such as lead local flood authorities and internal drainage boards.

Lead local flood authorities (unitary authorities or county councils) are responsible for managing local flood risk, including from surface water, ground water and ordinary watercourses, and for preparing local flood risk management strategies. Local planning authorities should work with lead local flood authorities to secure Local Plan policies compatible with the local flood risk management strategy.

Local planning authorities should also take advice where relevant, from:

- **Internal drainage boards:** local planning authorities should confer with internal drainage boards where they exist to identify the scope of their interests.
- **Reservoir undertakers:** local planning authorities should discuss their proposed site allocations with reservoir undertakers to:
 - avoid an intensification of development within areas at risk from reservoir failure, and;
 - ensure that reservoir undertakers can assess the cost implications of any reservoir safety improvements required due to changes in land use downstream of their assets.
- **Navigation authorities:** Navigation authorities should be consulted by the local planning authority in relation to sites adjacent to, or which discharge into, canals – especially where these are impounded above natural ground level.

Paragraph: 006 Reference ID: 7-006-20140306

Revision date: 06 03 2014

Is flood risk relevant to Local Plan policies that change the use of land or buildings?

A change in use may involve an increase in flood risk if the vulnerability classification of the development is changed – [see Table 2](#). For example, changing from industrial use to residential use will increase the vulnerability classification from 'less' to 'more' vulnerable. As changes of use are not subject to the [Sequential](#) or [Exception](#) tests, the local planning authority should consider when formulating policy what changes of use will be acceptable, having regard to the National Planning Policy Framework and taking into account the Strategic Flood Risk Assessment. This is likely to depend on whether developments can be designed to be safe and that there is safe access and egress.

Paragraph: 007 Reference ID: 7-007-20140306

Revision date: 06 03 2014

Is flood risk relevant to waste and minerals plans?

Waste and mineral planning authorities need to take account of flood risk when allocating land for development. They should prepare their plan policies with regard to any available Strategic Flood Risk Assessments. The location of Mineral Safeguarding Areas and site allocations, in particular in relation to sand and gravel workings which are often located in functional floodplains, need to be identified. It is possible to explore benefits, such as restoring mineral working located in flood risk areas to increase flood water storage, which can also enhance the natural environment. Partnership working on joint Strategic Flood Risk Assessments offers the best opportunity to identify and realise these opportunities.

Paragraph: 008 Reference ID: 7-008-20140306

Revision date: 06 03 2014

Strategic Flood Risk Assessment

What is a Strategic Flood Risk Assessment?

A Strategic Flood Risk Assessment is a study 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 \(https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances\)](https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances), and to assess the impact that land use changes and development in the area will have on flood risk.

Paragraph: 009 Reference ID: 7-009-20140306

Revision date: 06 03 2014

How should a Strategic Flood Risk Assessment be used in plan making?

The Strategic Flood Risk Assessment will be used to refine information on river and sea flooding risk shown on the Environment Agency's [Flood Map for Planning \(Rivers and Seas\) \(https://flood-map-for-planning.service.gov.uk/\)](https://flood-map-for-planning.service.gov.uk/). Local planning authorities should use the Assessment to:

- determine the variations in risk from all sources of flooding across their areas, and also the risks to and from surrounding areas in the same flood catchment;
- inform the [sustainability appraisal](#) (<https://www.gov.uk/guidance/strategic-environmental-assessment-and-sustainability-appraisal>) of the Local Plan, so that flood risk is fully taken into account when considering allocation options and in the preparation of plan policies, including policies for flood risk management to ensure that flood risk is not increased;
- apply the [Sequential Test](#) and, where necessary, the [Exception Test](#) when determining land use allocations;
- identify the requirements for site-specific flood risk assessments in particular locations, including those at risk from sources other than river and sea flooding;
- determine the acceptability of flood risk in relation to emergency planning capability;
- consider opportunities to reduce flood risk to existing communities and developments through better management of surface water, provision for conveyance and of storage for flood water.

See also:

- [How should a Strategic Flood Risk Assessment be prepared \(in general\)?](#)
- [How should a Strategic Flood Risk Assessment be prepared in terms of scope and detail?](#)
- [How should Strategic Flood Risk Assessment address surface water flooding issues?](#)
- [How should the assessment address the risk from reservoirs?](#)
- [How should a Strategic Flood Risk Assessment be used to identify the functional floodplain?](#)
- [Should a Level 2 Strategic Flood Risk Assessment take account of existing flood defences?](#)
- [How should the assessment cover flood defence breaching and overtopping, and risk to people behind flood defences?](#)

Paragraph: 010 Reference ID: 7-010-20140306

Revision date: 06 03 2014

How should a Strategic Flood Risk Assessment be prepared (in general)?

The Strategic Flood Risk Assessment should be prepared by local planning authorities in consultation with the Environment Agency, lead local flood authorities, local planning authorities' own functions of emergency response and drainage authority under the Land Drainage Act 1991 – and where appropriate, internal drainage boards. Where local authorities are the drainage authority, or are a Maritime District Council under the Coastal Protection Act 1949, or the lead local flood authority, local planning authorities should engage their engineering and emergency response staff when preparing the Assessment.

Local planning authorities should consult sewerage undertakers in developing their Local Plans, so that their Strategic Flood Risk Assessment takes account of any specific capacity problems and of the undertaker's drainage area plans.

Working collaboratively with other authorities, local planning authorities can develop Strategic Flood Risk Assessments covering a wider area and at a river catchment level. County level Assessments may also be appropriate where minerals and waste issues can be considered at the same time.

Paragraph: 011 Reference ID: 7-011-20140306

Revision date: 06 03 2014

How should a Strategic Flood Risk Assessment be prepared in terms of scope and detail?

There are 2 levels of Strategic Flood Risk Assessment, as set out in the following table:

[Levels of Strategic Flood Risk Assessment](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/580849/Levels_of_Strategic_Flood_Risk_Assessment.pdf)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/580849/Levels_of_Strategic_Flood_Risk_Assessment.pdf
(PDF, 68.8KB, 1 page)

A Level 2 Strategic Flood Risk Assessment should also reduce burdens on developers, in particular, at windfall sites, in the preparation of site-specific flood risk assessments. See the [Environment Agency's advice](https://www.gov.uk/local-planning-authorities-strategic-flood-risk-assessment) (<https://www.gov.uk/local-planning-authorities-strategic-flood-risk-assessment>) on Strategic Flood Risk Assessment for further information.

Paragraph: 012 Reference ID: 7-012-20140306

Revision date: 06 03 2014

How should Strategic Flood Risk Assessment address surface water flooding issues?

A Strategic Flood Risk Assessment should identify areas at risk from surface water flooding and drainage issues, taking account of the [surface water flood risk map](https://www.gov.uk/check-long-term-flood-risk) (<https://www.gov.uk/check-long-term-flood-risk>) published by the Environment Agency and any other available evidence, such as local flood risk management strategies. It should also identify the types of measure which may be appropriate to manage them, taking account of location, site opportunities, constraints and geology.

Paragraph: 013 Reference ID: 7-013-20140306

Revision date: 06 03 2014

How should the assessment address the risk from reservoirs?

The failure of a reservoir has the potential to cause catastrophic damage due to the sudden release of large volumes of water. The local planning authority will need 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. Local planning authorities will also need to evaluate in Strategic Flood Risk Assessments (and when applying the Sequential Test) how an impounding reservoir will modify existing flood risk in the event of a flood in the catchment it is located within, and/or whether emergency draw-down of the reservoir will add to the extent of flooding.

Paragraph: 014 Reference ID: 7-014-20140306

Revision date: 06 03 2014

How should a Strategic Flood Risk Assessment be used to identify the functional floodplain?

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, eg 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.

Paragraph: 015 Reference ID: 7-015-20140306

Revision date: 06 03 2014

Should a Level 2 Strategic Flood Risk Assessment take account of existing flood defences?

See the [Environment Agency's \(https://www.gov.uk/local-planning-authorities-strategic-flood-risk-assessment\)](https://www.gov.uk/local-planning-authorities-strategic-flood-risk-assessment) advice on development and flood risk.

Paragraph: 016 Reference ID: 7-016-20140306

Revision date: 06 03 2014

How should the assessment cover flood defence breaching and overtopping, and risk to people behind flood defences?

See the [Environment Agency's \(https://www.gov.uk/local-planning-authorities-strategic-flood-risk-assessment\)](https://www.gov.uk/local-planning-authorities-strategic-flood-risk-assessment) advice on development and flood risk.

Paragraph: 017 Reference ID: 7-017-20140306

Revision date: 06 03 2014

The sequential, risk-based approach to the location of development

What is the sequential, risk-based approach to the location of development?

This 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 should be to keep development out of medium and high flood risk areas (Flood Zones 2 and 3) and other areas affected by other sources of flooding where possible.

Application of the sequential approach in the plan-making process, in particular application of the Sequential Test, will help 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. According to the information available, other forms of flooding should be treated consistently with river flooding in mapping probability and assessing vulnerability to apply the sequential approach across all flood zones.

Waste and mineral planning authorities should apply the sequential approach to the allocation of sites for waste management and, where possible, mineral extraction and processing. It should also be recognised that mineral deposits have to be worked where they are (and sand and gravel extraction is defined as 'water-compatible development' in [table 2](#), acknowledging that these deposits are often in flood risk areas).

However, mineral working should not increase flood risk elsewhere and needs to be designed, worked and restored accordingly.

Mineral workings can be large and may afford opportunities for applying the sequential approach at the site level. It may be possible to locate ancillary facilities such as processing plant and offices in areas at lowest flood risk. Sequential working and restoration can be designed to reduce flood risk by providing flood storage and attenuation. This is likely to be most effective at a strategic (county) scale.

Paragraph: 018 Reference ID: 7-018-20140306

Revision date: 06 03 2014

The aim of the Sequential Test

What is the aim of the Sequential Test for the location of development?

The Sequential Test ensures that a sequential approach is followed to steer new development to areas with the lowest probability of flooding. The [flood zones](#) as refined in the Strategic Flood Risk Assessment for the area provide the basis for applying the Test. The aim is to steer new development to Flood Zone 1 (areas with a low probability of river or sea flooding). Where there are no reasonably available sites in Flood Zone 1, local planning authorities in their decision making should take into account the [flood risk vulnerability of land uses](#) and consider reasonably available sites in Flood Zone 2 (areas with a medium probability of river or sea flooding), 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 Flood Zone 3 (areas with a high probability of river or sea flooding) be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.

- Note: Table 2 categorises different types of uses & development according to their vulnerability to flood risk. Table 3 maps these vulnerability classes against the flood zones set out in Table 1 to indicate where development is 'appropriate' and where it should not be permitted.

Within each flood zone, surface water and other sources of flooding also need to be taken into account in applying the sequential approach to the location of development.

Paragraph: 019 Reference ID: 7-019-20140306

Revision date: 06 03 2014

Applying the Sequential Test in the preparation of a Local Plan

This is illustrated in diagram 2 (below). As some areas at lower flood risk may not be suitable for development for various reasons and therefore out of consideration, the Sequential Test should be applied to the whole local planning authority area to increase the possibilities of accommodating development which is not exposed to flood risk. More than one local planning authority may jointly review development options over a wider area where this could potentially broaden the scope for opportunities to reduce flood risk and put the most vulnerable development in lower flood risk areas.

Paragraph: 020 Reference ID: 7-020-20140306

Revision date: 06 03 2014

Diagram 2: Application of the Sequential Test for Local Plan preparation

[Diagram 2: application of the Sequential Test for Local Plan preparation](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/963382/Diagram_2.pdf)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/963382/Diagram_2.pdf

PDF, 635KB, 1 page

Notes to Diagram 2:

Other sources of flooding also need to be considered.

See [Table 1](#), [Table 2](#), [Table 3](#) and [Diagram 3](#).

See [guidance on applying the sequential test to individual applications](#).

See [further guidance on the role of sustainability appraisal in the sequential test](#).

Paragraph: 021 Reference ID: 7-021-20140306

Revision date: 06 03 2014

What is the role of sustainability appraisal in the sequential test?

A local planning authority should demonstrate through evidence that it has considered a range of options in the site allocation process, using the Strategic Flood Risk Assessment to apply the Sequential Test and the Exception Test where necessary. This can be undertaken directly or, ideally, as part of the sustainability appraisal. Where other sustainability criteria outweigh flood risk issues, the decision making process should be transparent with reasoned justifications for any decision to allocate

land in areas at high flood risk in the sustainability appraisal report. The Sequential Test can also be demonstrated in a free-standing document, or as part of strategic housing land or employment land availability assessments.

Paragraph: 022 Reference ID: 7-022-20140306

Revision date: 06 03 2014

The Exception Test

What is the Exception Test?

The Exception Test, as set out in [paragraph 160 of the Framework \(https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para160\)](https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para160), is a method to demonstrate and help ensure that flood risk to people and property will be managed satisfactorily, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.

Essentially, the 2 parts to the Test require proposed development to show that it will provide wider [sustainability benefits to the community that outweigh flood risk](#), and that it will be [safe for its lifetime](#), without increasing flood risk elsewhere and where possible reduce flood risk overall.

Paragraph: 023 Reference ID: 7-023-20140306

Revision date: 06 03 2014

How can wider sustainability benefits to the community that outweigh flood risk be demonstrated?

Evidence of wider sustainability benefits to the community should be provided, for instance, through the sustainability appraisal. If a potential site allocation fails to score positively against the aims and objectives of the sustainability appraisal, or is not otherwise capable of demonstrating sustainability benefits, the local planning authority should consider whether the use of planning conditions and/or planning obligations could make it do so. Where this is not possible the Exception Test has not been satisfied and the allocation should not be made.

Paragraph: 024 Reference ID: 7-024-20140306

Revision date: 06 03 2014

What needs to be considered to demonstrate that development will be safe for its lifetime?

Wider safety issues need to be considered as part of the plan preparation. If infrastructure fails then people may not be able to stay in their homes. Flood warnings and evacuation issues therefore need to be considered in design and layout of planned developments. In considering an allocation in a Local Plan a level 2 Strategic Flood Risk Assessment should inform consideration of the second part of the Exception Test. See further [information on making development safe from flood risk](#) and on [what is considered to be the lifetime of development](#).

Paragraph: 025 Reference ID: 7-025-20140306

Revision date: 06 03 2014

What is considered to be the lifetime of development in terms of flood risk and coastal change?

Residential development should be considered for a minimum of 100 years, unless there is specific justification for considering a shorter period. For example; the time in which flood risk or coastal change is anticipated to impact on it, where a development is controlled by a time-limited planning condition.

The lifetime of a non-residential development depends on the characteristics of that development. Planners should use their experience within their locality to assess how long they anticipate the development being present for. Developers would be expected to justify why they have adopted a given lifetime for the development, for example, when they are preparing a site-specific flood risk assessment. [The impact of climate change \(https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances\)](https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances) needs to be taken into account in a realistic way and developers, the local planning authority and Environment Agency should discuss and agree what allowances are acceptable.

Paragraph: 026 Reference ID: 7-026-20140306

Revision date: 06 03 2014

Applying the Exception Test in the preparation of a Local Plan

This is summarised in diagram 3 (below). The Exception Test should only be applied as set out in [Table 3](#) and following application of the Sequential Test.

Paragraph: 027 Reference ID: 7-027-20140306

Revision date: 06 03 2014

Diagram 3: Application of the Exception Test to Local Plan preparation

[Diagram 3: application of the Exception Test to Local Plan preparation \(https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/963383/Diagram_3.pdf\)](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/963383/Diagram_3.pdf)

PDF, 448KB, 1 page

Notes to diagram 3:

- [View diagram 2: Application of the Sequential Test for Local Plan preparation](#)
- [View table 2: Flood Risk Vulnerability Classification](#)
- [View table 3: Flood risk vulnerability and flood zone 'compatibility'](#)

Paragraph: 028 Reference ID: 7-028-20140306

Revision date: 06 03 2014

Addressing flood risk in individual planning applications

What do developers and applicants need to consider?

Developers and applicants need to consider flood risk to and from the development site, and it is likely to be in their own best interests to do this as early as possible, in particular, to reduce the risk of subsequent, significant additional costs being incurred. The broad approach of assessing, avoiding, managing and mitigating flood risk should be followed.

Paragraph: 029 Reference ID: 7-029-20140306

Revision date: 06 03 2014

Site-specific flood risk assessment

What is a site-specific flood risk assessment?

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. Where necessary the assessment should accompany a planning application submitted to the local planning authority. The assessment should demonstrate to the decision-maker how flood risk will be managed now and over the development's lifetime, taking [climate change \(https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances\)](https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances) into account, and with regard to the vulnerability of its users (see [Table 2 – Flood Risk Vulnerability](#)).

The objectives of a site-specific flood risk assessment are to establish:

- whether a proposed development is likely to be affected by current or future flooding from any source;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate;
- the evidence for the local planning authority to apply (if necessary) the Sequential Test, and;
- whether the development will be safe and pass the Exception Test, if applicable.

See [further information on the detail needed in a flood risk assessment](#).

Paragraph: 030 Reference ID: 7-030-20140306

Revision date: 06 03 2014

What level of detail is needed in a flood risk assessment?

The information provided in the flood risk assessment should be credible and fit for purpose. Site-specific flood risk assessments should always be proportionate to the degree of flood risk and make optimum use of information already available, including information in a Strategic Flood Risk Assessment for the area, and the [interactive flood risk maps \(http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e\)](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e) available on the Environment Agency's web site.

A flood risk assessment should also be appropriate to the scale, nature and location of the development. For example, where the development is an extension to an existing house (for which planning permission is required) which would not significantly increase the number of people present in an area at risk of flooding, the local planning authority would generally need a less detailed assessment to be able to reach an informed decision on the planning application. For a new development

comprising a greater number of houses in a similar location, or one where the flood risk is greater, the local planning authority would need a more detailed assessment.

See [further advice on flood risk assessment](#).

Paragraph: 031 Reference ID: 7-031-20140306

Revision date: 06 03 2014

What further advice is available on the preparation of a site-specific flood risk assessment?

To assist the developer, the local planning authority should set out and agree the scope of the flood risk assessment, using the [Environment Agency Standing Advice on flood risk \(https://www.gov.uk/flood-risk-assessment-local-planning-authorities\)](#), or in direct consultation with the Agency and/or any other relevant flood risk management bodies. Applicants for planning permission (or prior approval in the case of certain permitted development rights) will find the Agency's [advice on assessing flood risk for planning applications \(https://www.gov.uk/flood-risk-assessment-for-planning-applications\)](#) helpful when preparing a site-specific flood risk assessment for, and before designing, a development that raises lower risk concerns.

The [checklist in this guidance](#) may be helpful to applicants/developers in preparing a site-specific flood risk assessment.

Paragraph: 032 Reference ID: 7-032-20150415

Revision date: 15 04 2015 See revisions

Applying the Sequential Test to individual planning applications

How should the Sequential Test be applied to planning applications?

See advice on the [sequential approach to development](#) and the [aim of the sequential test](#).

The Sequential Test does not need to be applied for individual developments on sites which have been allocated in development plans through the Sequential Test, 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).

Nor should it normally be necessary to apply the Sequential Test to development proposals in Flood Zone 1 (land with a low probability of flooding from rivers or the sea), unless the Strategic Flood Risk Assessment for the area, or other more recent information, indicates there may be flooding issues now or in the future (for example, through the impact of climate change).

For individual planning applications where there has been no sequential testing of the allocations in the development plan, or where the use of the site being proposed is not in accordance with the development plan, the area to apply the Sequential Test across will be defined by local circumstances relating to the catchment area for the type of development proposed. For some developments this may be clear, for example, the catchment area for a school. In other cases it may be identified from other Local Plan policies, such as the need for affordable housing within a town centre, or a specific area identified for regeneration. For example, where there are large areas in Flood Zones 2 and 3 (medium to high

probability of flooding) and development is needed in those areas to sustain the existing community, sites outside them are unlikely to provide reasonable alternatives.

When applying the Sequential Test, a pragmatic approach on the availability of alternatives should be taken. For example, in considering planning applications for extensions to existing business premises it might be impractical to suggest that there are more suitable alternative locations for that development elsewhere. For nationally or regionally important infrastructure the area of search to which the Sequential Test could be applied will be wider than the local planning authority boundary.

Any development proposal should take into account the likelihood of flooding from other sources, as well as from rivers and the sea. The sequential approach to locating development in areas at lower flood risk should be applied to all sources of flooding, including development in an area which has critical drainage problems, as notified to the local planning authority by the Environment Agency, and where the proposed location of the development would increase flood risk elsewhere.

See also [advice on who is responsible for deciding whether an application passes the Sequential Test](#) and further advice on the Sequential Test process available from the [Environment Agency](#) (<https://www.gov.uk/flood-risk-assessment-the-sequential-test-for-applicants>) (flood risk standing advice).

Paragraph: 033 Reference ID: 7-033-20140306

Revision date: 06 03 2014

Who is responsible for deciding whether an application passes the Sequential Test?

It is for local planning authorities, taking advice from the Environment Agency as appropriate, to consider the extent to which Sequential Test considerations have been satisfied, taking into account the particular circumstances in any given case. The developer should justify with evidence to the local planning authority what area of search has been used when making the application. Ultimately the local planning authority needs to be satisfied in all cases that the proposed development would be safe and not lead to increased flood risk elsewhere.

Paragraph: 034 Reference ID: 7-034-20140306

Revision date: 06 03 2014

Applying the Exception Test to planning applications

When should the Exception Test be applied to planning applications?

See [general guidance on the Exception Test](#). The Exception Test should only be applied as set out in [Table 3](#) following application of the Sequential Test. An applicant will need to show that both elements of the Test, as set out in [paragraph 159](#) (<https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para159>) of the Framework, can be satisfied.

[Further advice on applying the Exception Test in areas requiring redevelopment or regeneration.](#)

Paragraph: 035 Reference ID: 7-035-20140306

Revision date: 06 03 2014

Does the Exception Test need to be applied in areas requiring redevelopment or regeneration?

If the Sequential Test to locate development where there is a lower risk of flooding has been applied within an area subject to redevelopment or regeneration, the applicant may also need to show that the Exception Test is passed for particular developments within the regeneration area in the circumstances set out in [Table 3](#). As the site is part of a regeneration strategy it is very likely that it will provide the wider sustainability benefits to pass the first part of the Exception Test. The developer still needs to show that the development will be safe and will not increase flood risk elsewhere.

Paragraph: 036 Reference ID: 7-036-20140306

Revision date: 06 03 2014

Demonstrating that the wider sustainability benefits to the community outweigh flood risk to satisfy the first part of the Exception Test

How can it be demonstrated that wider sustainability benefits to the community outweigh flood risk?

Local planning authorities will need to consider what criteria they will use in this assessment, having regard to the objectives of their Local Plan's Sustainability Appraisal framework, and provide advice which will enable applicants to provide the evidence to demonstrate this part of the Exception Test is passed.

If a planning application fails to score positively against the aims and objectives of the Local Plan Sustainability Appraisal or Local Plan policies, or other measures of sustainability, the local planning authority should consider whether the use of planning conditions and/or planning obligations could make it do so. Where this is not possible, the Exception Test has not been satisfied and planning permission should be refused.

Paragraph: 037 Reference ID: 7-037-20140306

Revision date: 06 03 2014

Developers to demonstrate that development will be safe to satisfy the second part of the Exception Test

What must developers do to demonstrate that development will be safe?

The developer must provide evidence to show that the proposed development would be [safe](#) and that any residual flood risk (further information in [paragraph 041](#) and [paragraph 042](#)) can be overcome to the satisfaction of the local planning authority, taking account of any advice from the Environment Agency. The developer's site-specific flood risk assessment should demonstrate that the site will be safe and that people will not be exposed to hazardous flooding from any source. The following should be covered by the flood risk assessment:

- the design of any flood defence infrastructure;
- [access and egress](#);
- operation and maintenance;
- design of development to manage and reduce flood risk wherever possible;
- resident awareness;

- [flood warning and evacuation](#) procedures (see also [advice](#) on when flood warning and evacuation plans are needed); and
- any funding arrangements necessary for implementing the measures.

Paragraph: 038 Reference ID: 7-038-20140306

Revision date: 06 03 2014

How can you ensure safe access and egress to and from the development?

Where access and egress is important to the overall safety of the development, this should be discussed with the local planning authority and Environment Agency at the earliest stage, as this can affect the overall design of the development. Access considerations should include the voluntary and free movement of people during a '[design flood](#)', as well as the potential for evacuation before a more extreme flood. Access and egress must be designed to be functional for changing circumstances over the lifetime of the development. Specifically:

- Access routes should allow occupants to safely access and exit their dwellings in design flood conditions. Vehicular access to allow the emergency services to safely reach the development during design flood conditions will also normally be required.
- Wherever possible, safe access routes should be provided that are located above design flood levels and avoiding flow paths. Where this is not possible, limited depths of flooding may be acceptable, provided that the proposed access is designed with appropriate signage etc to make it safe. The acceptable flood depth for safe access will vary depending on flood velocities and the risk of debris within the flood water. Even low levels of flooding can pose a risk to people in situ (because of, for example, the presence of unseen hazards and contaminants in floodwater, or the risk that people remaining may require medical attention).

Paragraph: 039 Reference ID: 7-039-20140306

Revision date: 06 03 2014

What is needed to ensure safe evacuation and flood response procedures are in place?

To demonstrate to the satisfaction of the local planning authority that the development will be safe for its [lifetime](#) taking account of the vulnerability of its users, a site-specific flood risk assessment may need to show that appropriate evacuation and flood response procedures are in place to manage the residual risk associated with an extreme flood event. In locations where there is a residual risk of flooding due to the presence of defences, judgements on whether a proposal can be regarded as safe will need to consider the feasibility of evacuation from the area should it be flooded. See also the [advice on flood warning and evacuation plans](#).

Proposals that are likely to increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required. To mitigate this impact it is especially important to look at ways in which the development could help to reduce the overall consequences of flooding in the locality,

either through its design (recognising that some forms of development may be more resistant or resilient to floods than others) or through off-site works that benefit the area more generally.

Paragraph: 040 Reference ID: 7-040-20140306

Revision date: 06 03 2014

What is “residual risk”?

Residual risks are those remaining after applying the sequential approach to the location of development and taking mitigating actions. Examples of residual flood risk include:

- the failure of flood management infrastructure such as a breach of a raised flood defence, blockage of a surface water conveyance system, overtopping of an upstream storage area, or failure of a pumped drainage system;
- failure of a [reservoir](#), or;
- a severe flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot cope with.

Areas behind flood defences are at particular risk from rapid onset of fast-flowing and deep water flooding, with little or no warning if defences are overtopped or breached.

Paragraph: 041 Reference ID: 7-041-20140306

Revision date: 06 03 2014

How should residual risk be addressed?

Where residual risk is relatively uniform, such as within a large area protected by embanked flood defences, the Strategic Flood Risk Assessment should indicate the nature and severity of the risk remaining, and provide guidance for residual risk issues to be covered in site-specific flood risk assessments. Where necessary, local planning authorities should use information on identified residual risk to state in Local Plan policies their preferred mitigation strategy in relation to urban form, risk management and where flood mitigation measures are likely to have wider sustainable design implications.

Paragraph: 042 Reference ID: 7-042-20140306

Revision date: 06 03 2014

How local planning authorities should involve the Environment Agency when determining planning applications where there is a risk of flooding

What are the requirements for involving the Environment Agency?

There is a statutory requirement for local planning authorities to consult the Environment Agency for developments in areas at risk of flooding (as defined in the [Town and Country Planning \(Development Management Procedure\) \(England\) Order 2015](#) (<http://www.legislation.gov.uk/ukSI/2015/595/schedule/4/made>) before granting planning permission. The Environment Agency has [Standing Advice](#) (<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>) available on its website which gives guidance to local planning

authorities and developers where flood risk is an issue, including on when the Environment Agency should be consulted on planning applications.

All local planning authorities should [notify the Environment Agency \(https://www.gov.uk/guidance/determining-a-planning-application#para019\)](https://www.gov.uk/guidance/determining-a-planning-application#para019) of the decision on any planning application where the Agency has objected on flood risk grounds.

Paragraph: 043 Reference ID: 7-043-20150415

Revision date: 15 04 2015 [See previous version \(http://webarchive.nationalarchives.gov.uk/20141202102440/http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/how-local-planning-authorities-should-involve-the-environment-agency-when-determining-planning-applications-where-there-is-a-risk-of-flooding/\)](http://webarchive.nationalarchives.gov.uk/20141202102440/http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/how-local-planning-authorities-should-involve-the-environment-agency-when-determining-planning-applications-where-there-is-a-risk-of-flooding/).

What should happen if a local planning authority wants to grant consent for a major development against Environment Agency advice?

For any major developments within Flood Zones 2 or 3, or on land within Flood Zone 1 which has been notified to the local planning authority as having critical drainage problems, which are the subject of a sustained objection by the Environment Agency on flood risk grounds, the local planning authority (and applicants) should bear in mind the requirements of the [Town and Country Planning \(Consultation\) \(England\) Direction 2021 \(https://www.gov.uk/government/publications/the-town-and-country-planning-consultation-england-direction-2021\)](https://www.gov.uk/government/publications/the-town-and-country-planning-consultation-england-direction-2021), if the authority is minded to grant permission for the development. In such cases, the authority, the Agency and the applicant should try to agree what changes could be made to the application that would enable the Agency to withdraw its objection. If the Agency concludes that it is unable to withdraw its objection and the authority is still minded to grant permission, the Direction requires the authority to notify the Secretary of State.

In this context, "major development" means:

- in respect of residential development, the provision of 10 or more dwellings, or a site of 0.5 hectares or more;
- in respect of non-residential development, new floorspace of 1,000 square metres or more, or a site of 1 hectare or more.

Paragraph: 044 Reference ID: 7-044-20140306

Revision date: 06 03 2014

How the local planning authority should involve the lead local flood authority when determining planning applications, and what advice should be given about local flood risks

What are the responsibilities of lead local flood authorities and how can they assist local planning authorities in considering planning applications?

Information about the [responsibilities of lead local flood authorities and guidance on securing compatibility between Local Plans and local flood risk management strategies](#)

When considering major development the local planning authority should consult the lead local flood authority on surface water drainage. Having regard to the available information on local flood risks, including the

Strategic Flood Risk Assessment and the updated [map of flood risk from surface water](http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfs#x=357683&y=355134&scale=2) (<http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfs#x=357683&y=355134&scale=2>) available on the Environment Agency's web site, local planning authorities may find it helpful to agree with lead local flood authorities the circumstances and locations where lead local flood authority advice should be sought on other planning applications which raise surface water or other local flood risk issues.

Where surface water or other local flood risks are likely to significantly affect a proposed development site, early discussions between the planning authority and the developer will help to identify the flood risk issues that the authority would expect to see addressed in the planning application and accompanying site-specific flood risk assessment.

Paragraph: 045 Reference ID: 7-045-20150323

Revision date: 23 03 2015 [See previous version](http://webarchive.nationalarchives.gov.uk/20141202102440/http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/how-the-local-planning-authority-should-involve-the-lead-local-flood-authority-when-determining-planning-applications-and-what-advice-should-be-given-about-local-flood-risks/) (<http://webarchive.nationalarchives.gov.uk/20141202102440/http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/how-the-local-planning-authority-should-involve-the-lead-local-flood-authority-when-determining-planning-applications-and-what-advice-should-be-given-about-local-flood-risks/>).

What is meant by “minor development” in relation to flood risk

Minor development means:

- minor non-residential extensions: industrial/commercial/leisure etc extensions with a footprint less than 250 square metres.
- alterations: development that does not increase the size of buildings eg alterations to external appearance.
- householder development: For example; 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 eg subdivision of houses into flats.

[See related policy \(https://www.gov.uk/guidance/national-planning-policy-framework\)](https://www.gov.uk/guidance/national-planning-policy-framework)

Paragraph: 046 Reference ID: 7-046-20140306

Revision date: 06 03 2014

The flood risk issues raised by minor developments

Are minor developments likely to raise flood risk issues?

Minor developments are unlikely to raise significant flood risk issues unless:

- they would have an adverse effect on a watercourse, floodplain or its flood defences;
- they would impede access to flood defence and management facilities, or;
- where the cumulative impact of such developments would have a significant effect on local flood storage capacity or flood flows.

The Environment Agency's [advice on flood risk assessment \(https://www.gov.uk/flood-risk-assessment-for-planning-applications\)](https://www.gov.uk/flood-risk-assessment-for-planning-applications) is helpful for ensuring extensions or alterations are designed and constructed to conform to any flood protection already incorporated in the property, and include flood resilience measures in the design.

Paragraph: 047 Reference ID: 7-047-20150415

Revision date: 15 04 2015 [See previous version \(http://webarchive.nationalarchives.gov.uk/20141202102440/http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/the-flood-risk-issues-raised-by-minor-developments/\)](http://webarchive.nationalarchives.gov.uk/20141202102440/http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/the-flood-risk-issues-raised-by-minor-developments/).

The flood risk issues raised by changes of use

What issues need to be considered and what does the applicant need to do?

A change in use may involve an increase in flood risk if the [vulnerability classification](#) of the development is changed. In such cases, the applicant will need to show in their flood risk assessment that future users of the development will not be placed in danger from flood hazards throughout its lifetime. Depending on the risk, mitigation measures may be needed. It is for the applicant to show that the change of use meets the objectives of the Framework's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development.

The local planning authority may have a Local Plan policy on what [changes of use](#) will be acceptable in areas at risk of flooding.

Paragraph: 048 Reference ID: 7-048-20140306

Revision date: 06 03 2014

Permitted development rights and flood risk

What are the flood risk considerations in relation to permitted development rights?

When considering the potential impacts of [permitted development \(https://www.gov.uk/guidance/when-is-permission-required#para018\)](https://www.gov.uk/guidance/when-is-permission-required#para018) on local flood risk, a local planning authority may consider making an Article 4 direction.

To assist local planning authorities in their determination of an application as to whether their prior approval is required for a change of use of agricultural buildings, or a change from commercial, business or service use to dwelling houses in an area at risk of flooding, the applicant should provide with their application an assessment of flood risk. This should demonstrate how the flood risks to the development will be managed so that it remains safe through its lifetime.

Paragraph: 049 Reference ID: 7-049-20210820

Revision date: 20 08 2021 [See previous version \(https://webarchive.nationalarchives.gov.uk/ukgwa/20210804004449/https://www.gov.uk/guidance/flood-risk-and-coastal-change#Permitted-development-rights-and-flood-risk\)](https://webarchive.nationalarchives.gov.uk/ukgwa/20210804004449/https://www.gov.uk/guidance/flood-risk-and-coastal-change#Permitted-development-rights-and-flood-risk)

Reducing the causes and impacts of flooding

What are the opportunities for reducing flood risk overall?

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](https://www.gov.uk/guidance/natural-environment#para027) (<https://www.gov.uk/guidance/natural-environment#para027>) 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.

Further advice is available on how to demonstrate the most [vulnerable development](#) is located in areas of lowest risk within a site

Paragraph: 050 Reference ID: 7-050-20140306

Revision date: 06 03 2014

Why are sustainable drainage systems important?

Sustainable drainage systems are designed to control surface water run off close to where it falls and mimic natural drainage as closely as possible. They provide opportunities to:

- reduce the causes and impacts of flooding;
- remove pollutants from urban run-off at source;
- combine water management with green space with benefits for amenity, recreation and wildlife.

See further guidance on the planning considerations on sustainable drainage in relation to water supply and water quality:

- [water quality](https://www.gov.uk/guidance/water-supply-wastewater-and-water-quality#water-quality) (<https://www.gov.uk/guidance/water-supply-wastewater-and-water-quality#water-quality>)
- [what to think about if there are concerns about water supply/quality?](https://www.gov.uk/guidance/water-supply-wastewater-and-water-quality#para019) (<https://www.gov.uk/guidance/water-supply-wastewater-and-water-quality#para019>)

Paragraph: 051 Reference ID: 7-051-20150323

Revision date: 23 03 2015 [See previous version](http://webarchive.nationalarchives.gov.uk/20141202102440/http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/reducing-the-causes-and-impacts-of-flooding/why-should-priority-be-given-to-the-use-of-sustainable-drainage-systems/) (<http://webarchive.nationalarchives.gov.uk/20141202102440/http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/reducing-the-causes-and-impacts-of-flooding/why-should-priority-be-given-to-the-use-of-sustainable-drainage-systems/>).

When should a sustainable drainage system be considered?

Whether a sustainable drainage system should be considered will depend on the proposed development and its location, for example whether there are concerns about flooding. Sustainable drainage systems may not be practicable for some forms of development (for example, mineral extraction). New development should only be considered appropriate in areas at risk of flooding [if priority has been given to the use of sustainable drainage systems](https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para163) (<https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para163>).

Additionally, and more widely, when considering major development, as defined in the [Town and Country Planning \(Development Management Procedure\) \(England\) Order 2015](http://www.legislation.gov.uk/uksi/2015/595/part/1/made) (<http://www.legislation.gov.uk/uksi/2015/595/part/1/made>), sustainable drainage systems should be provided unless demonstrated to be [inappropriate](http://www.parliament.uk/documents/commons-vote-office/December%202014/18%20December/6.%20DCLG-sustainable-drainage-systems.pdf) (<http://www.parliament.uk/documents/commons-vote-office/December%202014/18%20December/6.%20DCLG-sustainable-drainage-systems.pdf>).

Paragraph: 079 Reference ID: 7-079-20150415

Revision date: 15 04 2015 [See revisions](#)

(<http://webarchive.nationalarchives.gov.uk/20150417124459/http://planningguidance.planningportal.gov.uk/revisions/7/079/>).

What sort of sustainable drainage system should be considered?

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer.

Particular types of sustainable drainage systems may not be practicable in all locations. It could be helpful therefore for local planning authorities to set out those local situations where they anticipate particular sustainable drainage systems not being appropriate.

Paragraph: 080 Reference ID: 7-080-20150323

Revision date: 23 03 2015

Are there particular factors the local planning authority will address when considering a sustainable drainage system as part of a planning application?

In considering a development that includes a sustainable drainage system the local planning authority will want to be satisfied that the proposed minimum standards of operation are appropriate and that there are clear arrangements in place for ongoing [maintenance](#). Information sought by the local planning authority should be no more than necessary, having regard to the nature and scale of the development concerned.

Paragraph: 081 Reference ID: 7-081-20150323

Revision date: 23 03 2015

When would a sustainable drainage system be inappropriate?

The decision on whether a sustainable drainage system would be inappropriate in relation to a particular development proposal is a matter of judgement for the local planning authority. In making this judgement the local planning authority will seek [advice from the relevant flood risk management bodies](#), principally the lead local flood authority, including on what sort of sustainable drainage system they would consider to be reasonably [practicable](#).

The judgement of what is reasonably practicable should be by reference to the [technical standards](#) (<https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards>) published by the Department for Environment, Food and Rural Affairs and take into account [design and construction costs](#).

Paragraph: 082 Reference ID: 7-082-20150323

Revision date: 23 03 2015

Are the Department for Environment, Food and Rural Affairs' technical standards for sustainable drainage systems mandatory?

The [technical standards](#)

(<https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards>) provided by government relate to the design, construction, operation and maintenance of sustainable drainage systems and have been published as guidance for those designing schemes. In terms of the overall viability of a proposed development, expecting compliance with the technical standards is unlikely to be reasonably practicable if [more expensive](#) than complying with building regulations – provided that where there is a risk of flooding the development will be safe and flood risk is not increased elsewhere. Similarly, [a particular discharge route](#) would not normally be reasonable practicable when an alternative would cost less to design and construct.

Paragraph: 083 Reference ID: 7-083-20150323

Revision date: 23 03 2015

What is relevant to design and construction costs?

Construction costs can include the opportunity cost of providing land for a drainage system above ground where the land utilised for the drainage system is not also utilised for another land use. [Design costs also include the resulting maintenance and operation requirements](#) (<http://www.parliament.uk/documents/commons-vote-office/December%202014/18%20December/6.%20DCLG-sustainable-drainage-systems.pdf>) arising from the design.

Paragraph: 084 Reference ID: 7-084-20150323

Revision date: 23 03 2015

What about the operation and maintenance of a sustainable drainage system?

When planning a sustainable drainage system, developers need to ensure their design takes account of the construction, operation and maintenance requirements of both surface and subsurface components, allowing for any personnel, vehicle or machinery access required to undertake this work. Any sustainable drainage system should be designed so that the capacity takes account of the likely impacts of climate change and likely changes in impermeable area within the development over its lifetime and continues to provide effective drainage for properties. Whether maintenance and operation requirements are economically proportionate should be considered by reference to the costs that would be incurred by consumers for the use of an effective drainage system connecting directly to a public sewer.

Paragraph: 085 Reference ID: 7-085-20150323

Revision date: 23 03 2015

Where to go for advice on surface water drainage?

When considering major development the local planning authority should [consult the lead local flood authority](#) (<http://www.legislation.gov.uk/uksi/2015/595/schedule/4/made>). For other developments the local planning authority will want to consider the circumstances where it would be beneficial to [seek advice from the lead local flood authority](#). Local planning authorities are also advised to consult as appropriate:

1. The relevant sewerage undertaker where a connection with a public sewer is proposed.

2. The Environment Agency, if the drainage system directly or indirectly involves the discharge of water into a watercourse
3. The relevant highway authority for an affected road
4. The Canal and River Trust, if the drainage system may directly or indirectly involve the discharge of water into or under a waterway managed by them
5. An internal drainage board, if the drainage system may directly or indirectly involve the discharge of water into an ordinary watercourse (within the meaning of [section 72 of the Land Drainage Act 1991](#) (<http://www.legislation.gov.uk/ukpga/1991/59/contents>)) within the board's district.

Paragraph: 086 Reference ID: 7-086-20150323

Revision date: 23 03 2015

How can you demonstrate that the most vulnerable development is located in areas of lowest flood risk within the site?

This will be identified from a detailed site-specific flood risk assessment. Residential areas may contain a variety of land uses, including vehicle and pedestrian access, shops and other community facilities. Layout should be designed so that the most [vulnerable uses](#) are restricted to higher ground at lower risk of flooding, with development which has a lower vulnerability (parking, open space, etc) in the highest risk areas, unless there are overriding reasons to prefer a different location.

Paragraph: 053 Reference ID: 7-053-20140306

Revision date: 06 03 2014

Making development safe from flood risk

How can development be made safe from flood risk?

After applying a sequential approach so that, as far as possible, development is located to where there is the lowest risk of flooding, new development can be made safe by:

- designing buildings to avoid flooding by, for example, raising floor levels;
- providing adequate flood risk management infrastructure which will be maintained for the lifetime of the development, for example, using Community Infrastructure Levy or planning obligations, or [Partnership Funding](#) (<https://www.gov.uk/flood-and-coastal-defence-funding-submit-a-project>) where appropriate
- leaving space in developments for flood risk management infrastructure to be maintained and enhanced, and;
- mitigating the potential impacts of flooding through design and flood resilient and resistant construction.

When considering safety, specific local circumstances need to be taken into account, including:

- the characteristics of a possible flood event, eg the type and source of flooding and frequency, depth, velocity and speed of onset;

- the safety of people within a building if it floods and also the safety of people around a building and in adjacent areas, including people who are less mobile or who have a physical impairment. This includes the ability of residents and users to safely access and exit a building during a [design flood](#) and to evacuate before an extreme flood;
- the structural safety of buildings, and;
- the impact of a flood on the essential services provided to a development.

While safety considerations are always very important, local planning authorities should seek to ensure that communities are sustainable, including ensuring that certain sections of society, such as the elderly and those with less mobility, are not unnecessarily excluded from areas where there is a risk of flooding.

See also further advice on:

- [What is meant by a "design flood"?](#)
- [When are flood warning and evacuation plans needed?](#)
- [Who should be consulted on emergency planning issues and in relation to reservoirs?](#)

Paragraph: 054 Reference ID: 7-054-20150415

Revision date: 15 04 2015 [See previous version](#)
<http://webarchive.nationalarchives.gov.uk/20141202102440/http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/making-development-safe-from-flood-risk/>

What is meant by a "design flood"?

This is a flood event of a given annual flood probability, which is generally taken as:

- fluvial (river) flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), or;
- tidal flooding with a 0.5% annual probability (1 in 200 chance each year), against which the suitability of a proposed development is assessed and mitigation measures, if any, are designed.

Paragraph: 055 Reference ID: 7-055-20140306

Revision date: 06 03 2014

Are flood warning and evacuation plans needed?

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 (eg hostels and hotels).

Paragraph: 056 Reference ID: 7-056-20140306

Revision date: 06 03 2014

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

Flood warning and evacuation plans will need to take account of the likely impacts of climate change, eg 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.

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.

Paragraph: 057 Reference ID: 7-057-20140306

Revision date: 06 03 2014

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

Local planning authorities are advised 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.

Local planning authorities are also advised to consult with the owners/operators of raised reservoirs, to establish constraints upon safe development.

Paragraph: 058 Reference ID: 7-058-20140306

Revision date: 06 03 2014

Flood resilience and flood resistance

What is flood resilience and flood resistance?

Flood resistance, or dry-proofing, stops water entering a building. Flood resilience, or wet-proofing, accepts that water will enter the building, but through careful design will minimise damage and allow the re-occupancy of the building quickly. Flood resistance and resilience measures should not be used to justify development in inappropriate locations;

- **Flood resilient:** Flood-resilient buildings are designed and constructed to reduce the impact of flood water entering the building so that no permanent damage is caused, structural integrity is maintained and drying and cleaning is easier. The Department for Communities and Local Government has published [Improving the Flood Performance of New Buildings: flood resilient construction \(2007\)](https://www.gov.uk/government/publications/flood-resilient-construction-of-new-buildings) (<https://www.gov.uk/government/publications/flood-resilient-construction-of-new-buildings>). This provides guidance 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.
- **Flood resistance:** Flood-resistant construction can prevent entry of water or minimise the amount that may enter a building where there is short duration flooding outside with water depths of 0.6 metres or less. This form of construction should be used with caution and accompanied by resilience measures, as effective flood exclusion may depend on occupiers ensuring some elements, such as barriers to doorways, are put in place and maintained in a good state. Buildings may also be damaged by water pressure or debris being transported by flood water. This may breach flood-excluding elements of the building and permit rapid inundation. Temporary and demountable defences are not appropriate for new developments.

Further advice on [what needs to be considered in the use of appropriate flood resilience and resistance measures](#).

Paragraph: 059 Reference ID: 7-059-20140306

Revision date: 06 03 2014

What needs to be considered in the use of appropriate flood resilience and resistance measures?

The first preference should be to avoid flood risk. Where it is not possible, a building and its surrounds (at site level) may be constructed to avoid it being flooded (eg by raising it above the [design flood level](#)).

Since any flood management measures only manage the risk of flooding rather than remove it, flood resistance and flood resilience may need to be incorporated into the design of buildings and other infrastructure behind flood defence systems. Resistance and resilience measures are unlikely to be suitable as the only mitigation measure to manage flood risk, but they may be suitable in some circumstances, such as:

- water-compatible and less vulnerable uses where temporary disruption is acceptable and an appropriate flood warning is provided;
- in some instances where the use of an existing building is to be changed and it can be demonstrated that no other measure is practicable;
- as a measure to manage residual flood risk.

Further information on flood resilience and resistance is available as part of the [advice on flood risk assessment for planning applications](https://www.gov.uk/flood-risk-assessment-standing-advice) (<https://www.gov.uk/flood-risk-assessment-standing-advice>) available from the Environment Agency.

Paragraph: 060 Reference ID: 7-060-20150415

Revision date: 15 04 2015 [See previous version](#)
(<http://webarchive.nationalarchives.gov.uk/20141202102440/http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-resilience-and-flood-resistance/what-needs-to-be-considered-in-the-use-of-appropriate-flood-resilience-and-resistance-measures/>)

Neighbourhood planning

How should neighbourhood planning take account of flood risk?

The overall approach in [paragraph 100](#) (<https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para155>) of the National Planning Policy Framework applies to [neighbourhood planning](#) (<https://www.gov.uk/guidance/neighbourhood-planning--2>).

In summary, the qualifying bodies involved in neighbourhood planning should:

- seek to ensure neighbourhood plans and neighbourhood development/community right to build orders are informed by an appropriate assessment of flood risk;
- ensure policies steer development to areas of lower flood risk as far as possible;
- ensure that any development in an area at risk of flooding [would be safe](#), for its [lifetime](#) taking account of [climate change impacts](#) (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>);
- be able to demonstrate how flood risk to and from the plan area/development site(s) will be managed, so that flood risk will not be increased overall, and that opportunities to reduce [flood risk](#), for example, through the use of sustainable drainage systems, are included in the plan/order.

Local planning authorities should have in mind these aims in providing advice or assistance to qualifying bodies involved in neighbourhood planning. Further information on what information and advice should be made available is [here](#).

See also:

- [What to consider if there is a risk of flooding in the neighbourhood plan area?](#)
- [What to consider if bringing forward a Neighbourhood Development Order/Community Right to Build Order in an area at risk of flooding?](#)

Paragraph: 061 Reference ID: 7-061-20140306

Revision date: 06 03 2014

What advice and information on flood risk is available for neighbourhood planning?

Local planning authorities' [Strategic Flood Risk Assessments](#) should be the primary source of flood risk information in considering whether particular neighbourhood planning areas may be appropriate for development. Other important sources include the [interactive maps of flood risk](#) (http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e) available on the Environment Agency's web site.

Local planning authorities should make available to qualifying bodies any reports or information relating to the Strategic Flood Risk Assessment, and share any other information relevant to flood risk (such as the application of the [Sequential](#) and [Exception Tests](#) to the Local Plan).

Along with other statutory agencies, the Environment Agency has published advice on [neighbourhood planning](#) (http://webarchive.nationalarchives.gov.uk/20140328084622/http://cdn.environment-agency.gov.uk/LIT_6524_7da381.pdf). Anyone preparing a neighbourhood plan or order may also find it helpful to consult the [lead local flood authority](#) or the area.

Paragraph: 062 Reference ID: 7-062-20140306

Revision date: 06 03 2014

What should be considered if there is a risk of flooding in the neighbourhood plan area?

Where the Strategic Flood Risk Assessment, or other available flood risk maps or information, indicates that part or parts of a neighbourhood plan area may be at risk of flooding, the qualifying body will need to have regard to the National Planning Policy Framework's policies on flood risk. Where they are considering proposing development, they should show that this would be consistent with the local planning authority's application of the [Sequential Test](#) and if necessary, the [Exception Test](#) for the Local Plan.

Where areas under consideration for development are not consistent, or the relevant Local Plan is inconclusive, it is likely that the qualifying body will need to provide further information to demonstrate that any development proposed by the neighbourhood plan passes the Sequential Test, and if necessary the Exception Test.

Local planning authorities should provide advice to qualifying bodies on where and how they should demonstrate that policies and any site allocations in neighbourhood plans and Orders would satisfy the Sequential Test and, if necessary, the Exception Test, including the appropriate area to apply the Sequential Test. This will depend on a number of factors, including;

- the size of the neighbourhood planning area;
- the flood risks in the area and/or in its vicinity;
- the nature of the neighbourhood plan policies or Order proposals;
- the degree of conformity with strategic policies of the Local Plan, including site allocations, and whether these have been subject to the Sequential Test.

In providing advice, local planning authorities should have regard to flood risk across the whole of their areas. In particular, there may be places outside the neighbourhood planning area at lower flood risk which are suitable and reasonably available for the development proposed.

There is further guidance on the approach to [individual development proposals](#), or where a [Neighbourhood Development or Community Right to Build Order is proposed, in an area at risk of flooding](#).

Paragraph: 063 Reference ID: 7-063-20140306

Revision date: 06 03 2014

What should be considered if bringing forward a Neighbourhood Development Order/Community Right to Build Order in an area at risk of flooding?

The general approach and requirements for [site-specific flood risk assessments](#) should be applied to developments in areas at risk of flooding to be permitted by Neighbourhood Development/ Community Right to Build Orders. This means that for any development proposals:

- in [Flood Zone 2 or 3](#);
- or of at least 1 hectare;
- or in an area that has critical drainage problems (as notified to the local planning authority by the Environment Agency);
- or that may be subject to other sources of flood risk;

a site-specific flood risk assessment should support the draft Order. The [flood risk assessment checklist](#) may be helpful in this respect.

Where the neighbourhood planning area is in Flood Zone 2 or 3, or is in an area with critical drainage problems, advice on the scope of the flood risk assessment required should be sought from the Environment Agency. Where the area may be subject to other sources of flooding, it may be helpful to consult other bodies involved in flood risk management, as appropriate.

Where a Neighbourhood Development/Community Right to Build Order is under consideration for a site/area in Flood Zone 2 or 3, which has not been allocated in the development plan through the Sequential Test, and if necessary the Exception Test, it will be necessary for those proposing the development, in having regard to the National Planning Policy Framework's policies on flood risk, to demonstrate why the development cannot reasonably be located in areas of lower flood risk.

In all cases where new development is proposed, the [sequential approach](#) to locating development in areas of lower flood risk should still be applied within a neighbourhood planning area.

Neighbourhood Development/Community Right to Build Orders that propose new development that would be;

- contrary to [the flood risk vulnerability and flood zone compatibility table \(Table 3\)](#), or;
- within areas at risk of flooding where sequential testing shows there to be places at lower flood risk which are suitable and reasonably available for the development proposed,

should not be considered appropriate, having regard to the national policies on development and flood risk.

Paragraph: 064 Reference ID: 7-064-20140306

Revision date: 06 03 2014

Flood Zone and flood risk tables

- [Table 1: Flood Zones](#)
- [Table 2: Flood risk vulnerability classification](#)
- [Table 3: Flood risk vulnerability and flood zone 'compatibility'](#)

Table 1: Flood Zones

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

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

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

Paragraph: 065 Reference ID: 7-065-20140306

Revision date: 06 03 2014

Table 2: Flood risk vulnerability classification

Essential infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.
- Wind turbines.

Highly vulnerable

- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations

with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').

More vulnerable

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence; drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less vulnerable

- Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

Water-compatible development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.

- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

*** Landfill is as defined in [Schedule 10 of the Environmental Permitting \(England and Wales\) Regulations 2010](http://www.legislation.gov.uk/ukksi/2010/675/schedule/10/made) (<http://www.legislation.gov.uk/ukksi/2010/675/schedule/10/made>).

Paragraph: 066 Reference ID: 7-066-20140306

Revision date: 06 03 2014

Table 3: Flood risk vulnerability and flood zone 'compatibility'

[Table 3: flood risk vulnerability and flood zone 'compatibility'](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/575184/Table_3_-_Flood_risk_vulnerability_and_flood_zone_compatibility.pdf) (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/575184/Table_3_-_Flood_risk_vulnerability_and_flood_zone_compatibility.pdf) (PDF, 58.1KB, 1 page)

Key:

- ✓ Development is appropriate
- X Development should not be permitted.

Notes to table 3:

- This table does not show the application of the [Sequential Test](#) which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and [Exception Tests](#) do not need to be applied to [minor developments](#) and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

*** In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be 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.

Paragraph: 067 Reference ID: 7-067-20140306

Revision date: 06 03 2014

Site-specific flood risk assessment: Checklist

1 - Development site and location

You can use this section to describe the site you are proposing to develop. It would be helpful to include, or make reference to, a location map which clearly indicates the development site.

- a. Where is the development site located? (eg postal address or national grid reference)
- b. What is the current use of the site? (eg undeveloped land, housing, shops, offices)
- c. Which Flood Zone (for river or sea flooding) is the site within? (ie Flood Zone 1, Flood Zone 2, Flood Zone 3). As a first step, you should check the [Flood Map for Planning](https://flood-map-for-planning.service.gov.uk/) (<https://flood-map-for-planning.service.gov.uk/>) (Rivers and Sea). It is also a good idea to check the Strategic Flood Risk Assessment for the area available from the local planning authority.

2 - Development proposals

You can use this section to provide a general summary of the development proposals. It would be helpful to include, or make reference to, an existing block plan and a proposed block plan, where appropriate.

- a. What are the development proposal(s) for this site? Will this involve a change of use of the site and, if so, what will that change be?
- b. In terms of vulnerability to flooding, what is the vulnerability classification of the proposed development? See [Table 2](#) of this guidance for an explanation of the vulnerability classifications.
- c. What is the expected or estimated lifetime of the proposed development likely to be? (eg less than 20 years, 20-50 years, 50-100 years?). See [paragraph 026](#) of this guidance for further advice on how to assess the lifetime of developments for flood risk and coastal change purposes. (It may also be advisable to seek advice from the local planning authority).

3 - Sequential test

For developments in flood zones 2 or 3 only. (If the development site is wholly within flood zone 1, you can skip this section and go to section 4).

You can use this section to describe how you have applied the sequential test (if needed as set out in [paragraph 158](#) (<https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para158>) of the National Planning Policy Framework) to the proposed development, and the evidence to demonstrate how the requirements of the test have been met. See [paragraph 033](#) of this guidance for further information. (You are advised to contact the local planning authority to confirm whether the sequential test should be applied and to ensure the appropriate level of information is provided).

- a. What other locations with a lower risk of flooding have you considered for the proposed development?
- b. If you have not considered any other locations, what are the reasons for this?
- c. Explain why you consider the development cannot reasonably be located within an area with the lowest probability of flooding (flood zone 1); and, if your chosen site is within flood zone 3, explain why you consider the development cannot reasonably be located in flood zone 2. See [Table 1](#) for definitions of the flood zones.

d. As well as flood risk from rivers or the sea, have you taken account of the risk from any other sources of flooding in selecting the location for the development?

4 - Climate Change

How is flood risk at the site likely to be affected by climate change? (The local planning authority's Strategic Flood Risk Assessment should have taken this into account). Further advice on how to take account of the [impacts of climate change in flood risk assessments](https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances) (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>) is available from the Environment Agency.

5 - Site specific flood risk

You can use this section to describe the risk of flooding to and from the proposed development over its expected lifetime, including appropriate allowances for the impacts of climate change. It would be helpful to include any evidence, such as maps and level surveys of the site, flood datasets (eg flood levels, depths and/or velocities) and any other relevant data, which can be acquired through consultation with the [Environment Agency](https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#get-information-to-complete-an-assessment) (<https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#get-information-to-complete-an-assessment>), the lead local flood authority for the area, or any other relevant flood risk management authority. Alternatively, you may consider undertaking or commissioning your own assessment of flood risk, using methods such as computer flood modelling.

a. What is/ are the main source(s) of flood risk to the site? (eg tidal/sea, fluvial or rivers, surface water, groundwater, other?). You should consider the flood mapping available from the [Environment Agency](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=e) (<http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=e>), the Strategic Flood Risk Assessment for the area, historic flooding records and any other relevant and available information.

b. What is the probability of the site flooding, taking account of the maps of flood risk available from the [Environment Agency](http://apps.environment-agency.gov.uk/wiyby/37837.aspx) (<http://apps.environment-agency.gov.uk/wiyby/37837.aspx>), the local planning authority's Strategic Flood Risk Assessment and any further flood risk information?

c. Are you aware of any other sources of flooding that may affect the site?

d. What is the expected depth and level for the design flood? See [paragraph 055](#) of this guidance for information on what is meant by a "design flood". If possible, flood levels should be presented in metres above Ordnance Datum (ie, the height above average sea level).

e. Are properties expected to flood internally in the design flood and to what depth? Internal flood depths should be provided in metres.

f. How will the development be made safe from flooding and the impacts of [climate change](https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances) (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>), for its lifetime? Further information can be found in paragraphs [054](#) and [059](#) (including on the use of flood resilience and resistance measures) of this guidance.

g. How will you ensure that the development and any measures to protect the site from flooding will not cause any increase in flood risk off-site and elsewhere? Have you taken into account the impacts of [climate change](https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances) (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>)

[allowances](#)), over the expected lifetime of the development? (eg providing compensatory flood storage which has been agreed with the Environment Agency).

h. Are there any opportunities offered by the development to reduce the causes and impacts of flooding? See paragraph [050](#) of this guidance for further advice.

6. Surface water management *

You can use this section to describe the existing and proposed surface water management arrangements at the site using [sustainable drainage systems](#) wherever appropriate, to ensure there is no increase in flood risk to others off-site.

a. What are the existing surface water drainage arrangements for the site?

b. If known, what (approximately) are the existing rates and volumes of surface water run-off generated by the site?

c. What are the proposals for managing and discharging surface water from the site, including any measures for restricting discharge rates? For major developments (eg of 10 or more homes or major commercial developments), and for all developments in [areas at risk of flooding](#), sustainable drainage systems should be used, unless demonstrated to be inappropriate – see paragraphs [079-086](#) of this guidance for further advice.

d. How will you prevent run-off from the completed development causing an impact elsewhere?

e. Where applicable, what are the plans for the ongoing operation and/or maintenance of the surface water drainage systems?

7. Occupants and users of the development

You can use this section to provide a summary of the numbers of future occupants and users of the new development; the likely future pattern of occupancy and use; and proposed measures for protecting more vulnerable people from flooding.

a. Will the development proposals increase the overall number of occupants and/or people using the building or land, compared with the current use? If this is the case, by approximately how many will the number(s) increase?

b. Will the proposals change the nature or times of occupation or use, such that it may affect the degree of flood risk to these people? If this is the case, describe the extent of the change.

c. Where appropriate, are you able to demonstrate how the occupants and users that may be more vulnerable to the impact of flooding (eg residents who will sleep in the building; people with health or mobility issues etc) will be located primarily in the parts of the building and site that are at lowest risk of flooding? If not, are there any overriding reasons why this approach is not being followed?

8. Exception test

You can use this section to provide the evidence to support certain development proposals in flood zones 2 or 3 if, following application of the sequential test, it is appropriate to apply the exception test, as set out in [paragraphs 159](#) (<https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal->

[change#para159](#)) of the National Planning Policy Framework. See [paragraph 035](#) of this guidance for further information on the exception test. It is advisable to contact the local planning authority to confirm whether the exception test needs to be applied and to ensure the appropriate level of information is provided.

a. Would the proposed development provide wider sustainability benefits to the community? If so, could these benefits be considered to outweigh the flood risk to and from the proposed development? See [paragraph 037](#) of this guidance for further information.

b. How can it be demonstrated that the proposed development will remain safe over its lifetime without increasing flood risk elsewhere? See [paragraph 038](#) of this guidance for further information.

c. Will it be possible to for the development to reduce flood risk overall (eg through the provision of improved drainage)? See [paragraph 050](#) for further advice.

9. Residual risk

You can use this section to describe any [residual risks](#) that remain after the flood risk management and mitigation measures are implemented, and to explain how these risks can be managed to keep the users of the development safe over its lifetime. See [paragraph 042](#) of this guidance for more information.

a. What flood related risks will remain after the flood risk management and mitigation measures have been implemented?

b. How, and by whom, will these risks be managed over the lifetime of the development? (eg putting in place [flood warning and evacuation plans](#)).

10. Flood risk assessment credentials

You can use this section to provide details of the author and date of the flood risk assessment.

a. Who has undertaken the flood risk assessment?

b. When was the flood risk assessment completed?

Other considerations

- Managing surface water

The site-specific flood risk assessment will need to show how surface water runoff generated by the developed site will be managed. In some cases it may be advisable to detail the surface water management for the proposed development in a separate drainage strategy or plan. You may like to discuss this approach with the lead local flood authority (see [paragraph 006](#) of this guidance).

Surface water drainage elements of major planning applications (eg of 10 or more homes) are reviewed by the lead local flood authority for the area. As a result, there may be specific issues or local policies, for example the Local Flood Risk Management Strategy or Surface Water Management Plan, that will need to be considered when assessing and managing surface water matters.

It is advisable to contact the appropriate lead local flood authority prior to completing the surface water drainage section of the flood risk assessment, to ensure that the relevant matters are covered in sufficient detail.

Proximity to main rivers

If the development of the site involves any activity within specified distances of main rivers, a flood risk activity permit may be required in addition to planning permission. For non-tidal main rivers, a flood risk activity permit may be required if the development of the site is within 8 metres of a river, flood defence structure or culvert. For tidal main rivers, a flood risk activity permit may be required if the development of the site is within 16 metres of a river, flood defence structure or culvert. Details on obtaining a Flood Risk Activity Permit are available from the [Environment Agency \(https://www.gov.uk/guidance/flood-risk-activities-environmental-permits\)](https://www.gov.uk/guidance/flood-risk-activities-environmental-permits).

Paragraph: 068 Reference ID: 7-068-20140306

Revision date: 16 11 2016 [See previous version \(http://webarchive.nationalarchives.gov.uk/20160601171236/http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/site-specific-flood-risk-assessment-checklist/\)](http://webarchive.nationalarchives.gov.uk/20160601171236/http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/site-specific-flood-risk-assessment-checklist/)

What is the general planning approach to development and coastal change?

The aim of the policy on coastal change, as set out in [paragraphs 166 \(https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para166\)](https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para166) of the National Planning Policy Framework, is to reduce risk from coastal change by avoiding inappropriate development in vulnerable areas or adding to the impacts of physical changes to the coast. The general approach can be summarised as follows:

- Local planning authorities apply [Integrated Coastal Zone Management](#) to integrate terrestrial and marine planning regimes;
- Local planning authorities identify Coastal Change Management Areas (further information in [paragraph 071](#) and [paragraph 072](#)) likely to be affected by physical changes to the coast;
- Local planning authorities are expected to be clear [what development will be appropriate in Coastal Change Management Areas](#) and make provision for development and infrastructure that needs to be [relocated away from Coastal Change Management Areas](#).

Paragraph: 069 Reference ID: 7-069-20140306

Revision date: 06 03 2014

Why it is important to apply Integrated Coastal Zone Management

Integrated Coastal Zone Management is a process which requires the adoption of a joined-up and participative approach towards the planning and management of the many different elements in coastal areas (land and marine). The recognised key principles which should guide all partners in implementing an integrated approach to the management of coastal areas are:

- a long term view
- a broad holistic approach
- adaptive management
- working with natural processes

- support and involvement of all relevant administrative bodies
- use of a combination of instruments
- participatory planning
- reflecting local characteristics

In coastal areas, local planning authorities should collaborate with the Marine Management Organisation to ensure that plans and policies across the land/sea boundary are coordinated. Further guidance on the Marine Management Organisation's role is available [here](#).

Local planning authorities are strongly encouraged to adopt the principles set out in the [Coastal Concordat for England](#) (<https://www.gov.uk/government/publications/a-coastal-concordat-for-england>), which is available on the UK Government's web site (publications), working in collaboration with other relevant public bodies to coordinate the consenting process for coastal development.

See related policy (<https://www.gov.uk/guidance/national-planning-policy-framework/10-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para105>)

Paragraph: 070 Reference ID: 7-070-20140306

Revision date: 06 03 2014

Coastal Change Management Areas

What is a Coastal Change Management Area?

This is an area identified in Local Plans as likely to be affected by coastal change (physical change to the shoreline through erosion, coastal landslip, permanent inundation or coastal accretion).

See related policy in [paragraph 166](#) (<https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para166>) of the National Planning Policy Framework.

Paragraph: 071 Reference ID: 7-071-20140306

Revision date: 06 03 2014

What are the considerations in defining Coastal Change Management Areas?

A Coastal Change Management Area will only be defined where rates of shoreline change are significant over the next 100 years, taking account of [climate change](#) (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>). They will not need to be defined where the accepted shoreline management plan policy is to hold or advance the line (maintain existing defences or build new defences) for the whole period covered by the plan, subject to evidence of how this may be secured.

Local planning authorities should demonstrate that they have considered shoreline management plans, which provide a large-scale assessment of the risks associated with coastal processes, and should provide the primary source of evidence in defining the coastal change management area and inform land allocation within it. Other sources that may help inform decisions on the appropriate area for the coastal change management area include:

- [catchment flood management plans](http://www.environment-agency.gov.uk/research/planning/33586.aspx) (<http://www.environment-agency.gov.uk/research/planning/33586.aspx>)*

- estuary management plans
- harbour management plans
- [river basin management plans \(http://www.environment-agency.gov.uk/research/planning/33106.aspx\)](http://www.environment-agency.gov.uk/research/planning/33106.aspx)*
- Environment Agency's [coastal erosion map \(http://www.environment-agency.gov.uk/homeandleisure/134808.aspx\)](http://www.environment-agency.gov.uk/homeandleisure/134808.aspx)*

[Shoreline management plans \(http://www.environment-agency.gov.uk/research/planning/104939.aspx\)](http://www.environment-agency.gov.uk/research/planning/104939.aspx)* identify risk in 3 time horizons (up to 20, 50 and 100 years) and include maps showing the geographical extent of each risk area. Local planning authorities have discretion to determine how these are interpreted in planning terms to define the coastal change management area and whether it should show the separate zones for each of the 3 time horizons – or whether it should rely on the shoreline management plan for the area to provide that level of information. Where the shoreline management plan policy is to hold the line over part of the 100-year period, evidence would be expected to be provided of how this may be secured.

Although the primary basis for defining the coastal change management area are the physical processes affecting the coast, the local planning authority may want to take into account the boundaries of existing settlements and requirements for facilitating roll-back and relocation of land uses.

* * * More information is available on the Environment Agency website.

Paragraph: 072 Reference ID: 7-072-20140306

Revision date: 06 03 2014

What development will be appropriate in a Coastal Change Management Area?

[Essential infrastructure](#) may be permitted in a coastal change management area, provided there are clear plans to manage the impacts of coastal change on it, and it will not have an adverse impact on rates of coastal change elsewhere.

Ministry of Defence installations that require a coastal location can be permitted within a coastal change management area, provided there are clear plans to manage the impacts of coastal change. Where the installation will have a material impact on coastal processes, this must be managed to minimise adverse impacts on other parts of the coast.

For other development the following criteria can be used as a basis for decisions on what may be appropriate:

- Within the short-term risk areas (ie 20-year time horizon) only a limited range of types of development directly linked to the coastal strip, such as beach huts, cafes/tea rooms, car parks and sites used for holiday or short-let caravans and camping – all with time-limited planning permissions;
- Within the medium (20 to 50-year) and long-term (up to 100-year) risk areas, a wider range of time-limited development, such as hotels, shops, office or leisure activities requiring a coastal location and providing substantial economic and social benefits to the community, may be appropriate. Other significant development, such as key community infrastructure, is unlikely to be appropriate unless it has to be sited within the coastal change management

area to provide the intended benefit to the wider community and there are clear, costed plans to manage the impact of coastal change on it and the service it provides;

- Permanent new residential development will not be appropriate within a coastal change management area.

In all cases, there should still be careful consideration of the policies on development and flood risk, including [table 2](#) and [table 3](#).

Further advice on:

- [how a vulnerability assessment can be used to demonstrate whether development is appropriate in a coastal change management area](#)
- [permitted development rights in areas at risk of coastal change](#)
- [how neighbourhood plans and Neighbourhood Development/Community Right to Build Orders should take account of coastal change](#)

Advice is also available on [what approach should be taken to making provision for the relocation of development away from Coastal Change Management Areas](#).

Paragraph: 073 Reference ID: 7-073-20140306

Revision date: 06 03 2014

Can a vulnerability assessment be used to demonstrate whether development is appropriate in a coastal change management area?

Local planning authorities may wish to consider whether information about the vulnerability of new development would be helpful to demonstrate the appropriateness of a development in a coastal change management area. It would be advisable for the developer to agree the scope of a vulnerability assessment (which should be appropriate to the degree of risk and the scale, nature and location of the development) in advance with the local planning authority and in consultation with the Environment Agency and any other relevant stakeholders.

In considering the requirements in [paragraph 168](#) (<https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para168>) of the National Planning Policy Framework a vulnerability assessment might demonstrate that the development:

- would not impair the ability of communities and the natural environment to adapt sustainably to the impacts of a changing climate;
- will be safe through its planned lifetime, without increasing risk to life or property, or requiring new or improved coastal defences;
- would not affect the natural balance and stability of the coastline or exacerbate the rate of shoreline change to the extent that changes to the coastline are increased nearby or elsewhere.

The assessment could also consider measures for managing the development at the [end of its planned life](#), including any proposals for the removal of the development before the site is immediately threatened by shoreline changes. Further advice on [limiting the planned lifetime of development](#).

Paragraph: 074 Reference ID: 7-074-20140306

Revision date: 06 03 2014

How can planning limit the planned lifetime of development?

This can be achieved by time-limited planning permissions that can contain conditions relating to the review of that permission in relation to rates of coastal change and removal of the development prior to the anticipated impact of the coastal change. The Local Planning authority should be satisfied that adequate and secure financial arrangements are in place for the removal of time-limited development.

Paragraph: 075 Reference ID: 7-075-20140306

Revision date: 06 03 2014

What approach should be taken to making provision for the relocation of development away from Coastal Change Management Areas?

Formally allocating land in Local Plans for relocation of development and habitat affected by coastal change may be appropriate in some instances. An approach that takes into account the exceptional circumstances of having to replace existing development at risk of coastal change by granting planning permissions where normally they would be refused may be more suitable for some coastal authorities.

See related policy in [paragraph 166 \(https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para166\)](https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para166) of the National Planning Policy Framework.

Paragraph: 076 Reference ID: 7-076-20140306

Revision date: 06 03 2014

Permitted development rights in areas at risk from coastal change

What issues do local planning authorities need to consider in relation to [permitted development rights \(https://www.gov.uk/guidance/when-is-permission-required#General-Permitted-Development-Order\)](https://www.gov.uk/guidance/when-is-permission-required#General-Permitted-Development-Order) in coastal change areas?

Where extensions and alterations which are permitted development under the Town and Country Planning (General Permitted Development) (England) (Order) 2015 are likely to result in an increase in the scale of property and number of occupants at risk from coastal change in the short-term (ie next 20 years), local planning authorities should consider whether to make use of their powers under [article 4 of the Order \(http://www.legislation.gov.uk/ukSI/2015/596/article4/made\)](http://www.legislation.gov.uk/ukSI/2015/596/article4/made) to require planning permission to be sought in each case.

See related policy in [paragraph 166 \(https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para166\)](https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para166) of the National Planning Policy Framework.

Paragraph: 077 Reference ID: 7-077-20150415

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How neighbourhood plans and neighbourhood development/community right to build orders should take account of coastal change

In line with the core planning principles and the policy on coastal change neighbourhood plans and neighbourhood Development/Community Right to Build Orders should avoid allowing inappropriate development in areas vulnerable to coastal change, or adding to the impacts of physical changes to the coast.

In any instance where a neighbourhood planning area is proposed in a coastal change management area, careful attention should be paid to the guidance on [what development would be appropriate in such an area](#), including whether [time-limiting planning permissions](#) would be needed. The local planning authority should be consulted on what information about the vulnerability of new development would be helpful to demonstrate appropriateness in a coastal change management area.

See related policy in [paragraphs 166 \(https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para166\)](https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change#para166) of the National Planning Policy Framework.

Paragraph: 078 Reference ID: 7-078-20140306

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APPENDIX 10

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