DB/STB/dc 418F 24 August 2022 v2

NATIONAL PLANNING POLICY FRAMEWORK march 2012 - FLOOD RISK

FLOOD RISK ASSESSMENT

WHITE HOUSE FARM,
SPILSBY ROAD,
THORPE ST PETER,
LINCOLNSHIRE
PE24 4PU

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NATIONAL PLANNING POLICY FRAMEWORK - FLOOD RISK

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Part Two

Appendices

NATIONAL PLANNING POLICY FRAMEWORK - FLOOD RISK

FLOOD RISK ASSESSMENT 1.0 Introduction

1.1

"DC Architectural Services Ltd" have been commissioned to prepare a Site-Specific Flood Risk Assessment to accompany a submission to the Planning Authority seeking consent for the agricultural equipment store, white house farm, Spilsby road, Thorpe st peter, Lincolnshire PE24 4PU

1.2 Objective

1.2.1 The objective is to comply with National Planning Policy Framework (NPPF), published by National Government in March 2012. These state that it is a matter for applicants to investigate the potential Flood - associated risks relating to individual development proposals. The purpose of this Flood Risk Assessment is therefore to:

- Demonstrate whether the project is likely to be affected by flooding from any source, either now or in the future.
- Satisfy the Local Planning Authority that the development would be suitable and, where possible, reduces the flood risk overall.
- Demonstrate whether the flood risk will be increased elsewhere.
- Demonstrate the measures proposed to deal with the identified flood effects and risks.

2.0 Planning Application

2.1 Planning Application

2.1.1 This document is to support a Full Planning Application for store on an existing farming unit.

3.0 The Application Site

3.1 Application Site

3.1.1 The site is part of White House Farm, land site and is located on a grassed area. The site totals an area of 9.70 hectares. The site is bounded by open land and farm buildings to all sides (refer Appendix E). The site is level being in open fenland at a height of 2.30m ODN (refer to site plan at Appendix A).

4.0 Existing Planning Permission

3.1.2 The site as a whole has the benefit of existing use for many years.

5.0 Proposed Development

5.1 Development

5.1.1 The development is for a agricultural machinery store Appendix B shows an illustrative layout of the proposed development. Appendix C shows the existing site.

6.0 Assessment of the Risk

6.1 Assessment of the Risk

There are four areas to consider in the context of this:

6.1.1 Coastal

The Environment Agency flood maps identify the area to be Zone 3a at risk from flooding, the District Council SFRA Study area has been consulted and the site flooding probability falls in category 3 (high probability) equal to Environment Agency zone 3 assessed as having an annual probability of flooding of 0.1-0.5% between 1:200 and 1:1000 probability in each year, with a possible flood depth of 1.25m – 2.0m ODN

6.1.2 Main River

The nearest EA asset is the Wainfleet Relief which has an earth bank protection of 5.8m ODN. The Environment Agency map indicates the possibility of river flooding without taking into account existing defences as between 1% (1:100) chance of happening in any year. This supports the identification of the site falling in Zone 3 without taking into account of existing flood defences. The District Council Strategic Flood Risk Assessment takes into account the existing defences as cat 3. Throughout the area, banks are inspected, assessed as in good condition failure is unlikely. Flood is therefore most likely from overtopping resulting in low velocities and shallow depths. The District Council SFRA identify the surface water risk as Category 3. The SHDC SFRA identifies the Steeping Relief to the west to pose a greater risk than the Steeping River but is some way to the east to have a lesser effect. The site remains largely outside the low risk area a less than 0.1% annual probability.

6.1.3 Ordinary Water Course

The nearest significant Internal Drainage Board asset is the Wolds Drain 500m to the west, Crowcroft drain 1.5km to the east, the steeping 1.0km south east, Wainfleet relief 900m south. Drain, The drainage from our site area drains into field drains and ultimately into boards drains that are managed by I.D.B.

6.1.4 Land

The site lies on land to the Due North West of Thorpe st Peter on existing farm premises shown in Appendix E. It lies on a level ground surrounded by property and agricultural land.

The land lies in a flat typical fenland. Its position means that it will not be subject to flooding from higher land.

6.1.5 Reservoir

There are no reservoir which are close enough to have any risk effect to the development. SEE APPENDIX H

6.1.6 References

The District Council Strategic Flood Risk Assessment has been used as a source of information and an extract are found in appendix G.

Environment Agency. Flood information

Witham Forth Internal Drainage Board.

Zone	Characteristic	Assigned Annual Probability of Flooding
1	Low Probability	Fluvial & Tidal Less than 0.1% (1 in 1000 or more years)
2	Medium Probability	Fluvial 0.1% to 1% (from 1 in 100 to 1 in 1000 years) Tidal 0.1% to 0.5% (from 1 in 200 to 1 in 1000 years)
3a	High Probability	Fluvial Greater than 1% (1 in 100 or less years) Tidal Greater than 0.5% (1 in 200 or less years)
3b	Functional Floodplain	To be identified by LPA in agreement with Environment Agency

6.1.7 Evaluation of the Risk (including allowance for climate)

Flooding of the Site

Evaluation		1 Low Risk				5 High	Magnitude					
		1	2	3	4	5	1	2	3	4	5	
Land			/					/				
Fluvial			/							/		
Tidal			/					/				
Drains			/					/				

Flooding Elsewhere

Evaluation		Risk					Magnitude				
		1	2	3	4	5	1	2	3	4	5
Land		/					/				
Property		/					/				

The risk is evaluated as **Low**

6.1.8 Residual Risk of Flooding

The actual risk to the site taking into account flood defences is low however a residual risk remains in the event of defence failure ie over topping or breach.

ANNUAL CHANCE 0.5% (1:1000)

		2006	2115
Over Topping	Max Hazard	Low	low
	Max Depth	-	-
	Max Velocity	-	-
Breach	Max Hazard	-	Danger for some
	Max Depth (m)	-	0.0 – 0.25
	Max Velocity (m/s)	-	0.0 - 0.3

6.1.9 Risk Conclusions

Having identified the site in relation to the District Council SFRA and EA predictions, the site is confirmed as Zone 3. From the Environment Agency Flood Risk Matrix commercial extension exceeding 250m^2 requires sequential and where necessary exception test.

Zone 1 Low Probability

Definition

This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).

Appropriate uses

All uses of land are appropriate in this zone.

FRA requirements

For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a FRA. This need only be brief unless the factors above or other local considerations require particular attention. See Annex E for minimum requirements.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage techniques.

7.0 Flood Risk Matrix

7.1 Flood Risk Matrix

7.1.1 The flood risk matrix in Appendix F identifies the development of greater than 250sq m in Zone 3 as requiring a flood risk assessment. Consultation with the EA is required. A detailed drainage scheme is required before commencement.

Please refer to the National Planning Practice Guidance (Table 3) for advice on when the Sequential and Exception Tests are applicable	Environment Agency Environmental Permitting Regime distance - any works within 8m of fluvial Main River, or 16m of tidal defences (including culverting or control of flow of any river or stream).	Danger to ALL (Hazard Rating >2)	Danger to MOST (Hazard Rating 1.25 - 2)	Danger to SOME (Hazard Rating 0.75 - 1.25)	Low Hazard (Hazard Rating 0 - 0.75)	Flood Zone 3	Flood Zone 2
Water Compatible (excluding development that includes essential ancillary sleeping or residential accommodation)	Consult EA	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation	No Comment	No Comment
Major & Non-major* 'Less Vulnerable' uses, e.g. commercial/industrial development	Consult EA	Consult EA	Appropriate Mitigation	Appropriate Mitigation	No Comment	No Comment	No Comment

8.0 Sequential Test

8.1 Sequential Test

8.1.1 This risk-based approach endeavours to place development that is most vulnerable away from areas that are at most risk.

8.1.2 This development falls into the District Council SFRA Category 3: probability risk of flooding.

8.1.3 When applying the test as figure 4.1, the proposal passes the test being in Zone 3; less vulnerable use category is considered compatible.

7.1.4 An exception test would be required only for more vulnerable classification.

Site showing flood zone 3 in the greater area

8.2 Sequential Test Conclusion

8.2.1 This risk-based approach endeavours to place development that is most vulnerable away from areas that are at most risk.

The proposal is for on farm storage of equipment and machinery the proposal must be withing the confines of the site to be able to perform its function. It can be seen from the EA flood zone map that there are no availability of suitable sites or property in the area with a lower flood zone risk than 3.

8.2.2 The appropriate designate in table D3 would indicate a sequential test is passed as suitable development type for the risk and an exemption test is not required.

9.0 Exemption Test

9.1 Exemption Test

Table D.2: Flood Risk Vulnerability Classification

Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk, and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.
Highly Vulnerable	• Police stations, Ambulance stations and fire stations and Command Centres and 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.[19]
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.[20] • Sites used for holiday or short-let caravans and camping, **subject to a specific warning and evacuation plan.**
Less Vulnerable	• Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non–residential institutions not included in 'more vulnerable'; 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 plants. • Sewage treatment plants (if adequate pollution control measures are in place).

Agriculture – less vulnerable

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	×	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	×	×	×

Key: ✓ Development is appropriate.
× Development should not be permitted.

9.1.1 The appropriate designate in table 2 would indicate an exemption test is not required.

Paragraph: 031 Reference ID: 7-031-20220825

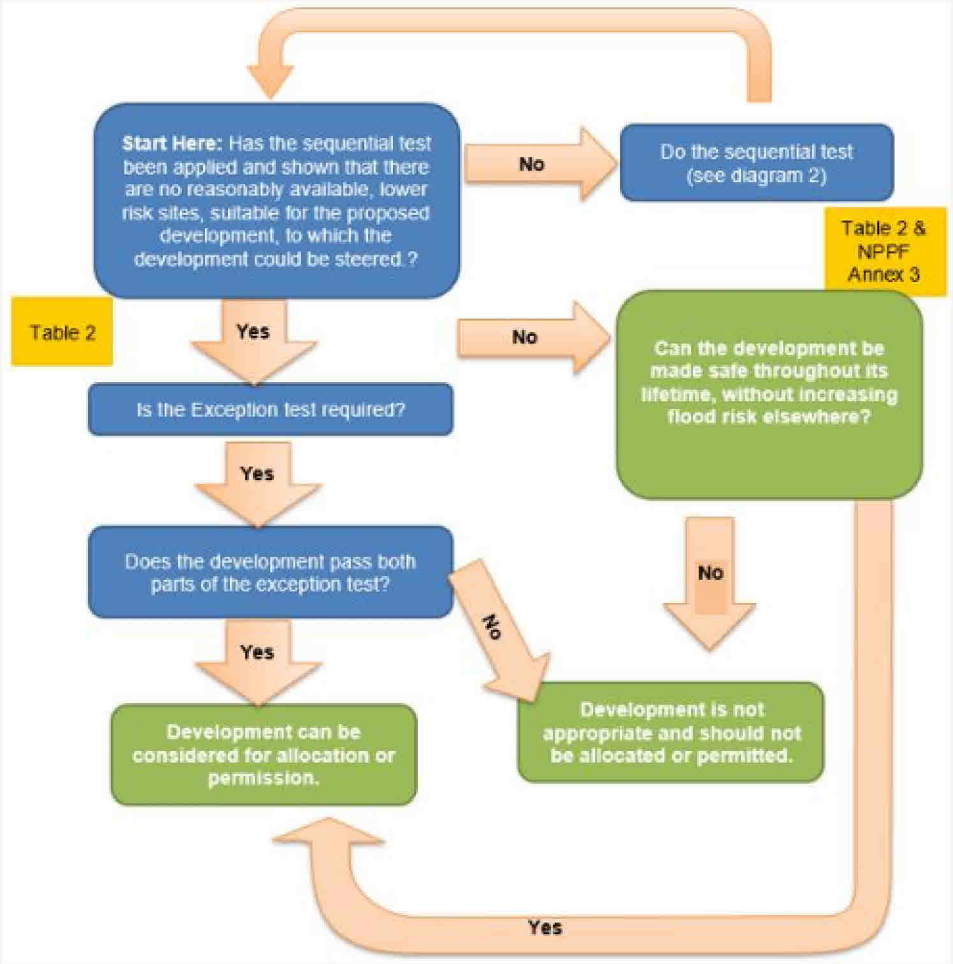
Revision date: 25 08 2022

Does the Exception Test need to be applied to all proposed development in flood risk areas?

The Exception Test should only be applied as set out in Table 2 and only if the Sequential Test has shown that there are no reasonably available, lower-risk sites, suitable for the proposed development, to which the development could be steered.

Paragraph: 032 Reference ID: 7-030-20220825

Diagram 3: Application of the Exception Test to plan preparation



Route demonstrating exemption test passed

10.0 Existing Drainage

10.1 Existing Drainage

9.1.2 The site for the building is entirely covered with permeable surface. With no existing drainage being drained to farm ditches

9.1.3 The land is under layered with silty or soft clay subsoils.

11.0 Effect of the Proposal

11.1 Effect of the Proposal

11.1.1 The existing site of site is made up of grassed areas. This is drained by series of pipes of pipes, gullies and channels discharge into the farm ditches and eventually IDB drain .

11.1.2 The proposal is to build a new storage building over existing permeable area– an indicative layout is shown at Appendix B. As the building will utilize the existing pumped controlled discharge for area there will be no change in the flow velocities.

11.1.3 The application is for planning permission at this stage, a schematic drainage solution is proposed in Appendix D.

11.1.4 In principle, as the existing site consists of extensive impermeable areas drainage with existing positive drainage with no flooding history, it would not be unreasonable to expect the drainage system to remain unchanged as run off from present levels.

11.1.5 The NPPF seeks to provide post-development run off at greenfield rates or 25% reduction of run off on previously developed sites. A further 30% should be added to projected run-offs to allow for climate change. However in this instance the site is not being redeveloped in the traditional sense and the proposal is for it to remain the same.

11.1.6 The effect of the proposal will not increase the probability of flooding elsewhere due to the neutral off site run-off rate achieved.

12.0 Effect of the Proposal on People and Property

12.1 Flooding Effect Fluvial

12.1.1 The existing site of site is made up of permeable areas. This is drained by series of pipes and gullies.

12.1.2 The District Council SFRA considers the risk of overtopping of the Steeping to the east to have the highest probability of occurring in any one year the analysis provide an insight into risks and projected depths, the site levels provide some protection and the area remains outside the low risk area and the projected depths 2115 are outside the projected depth area for the building and 0 - 0.25m. The site remains outside the low risk area. The SFRA also considers a breach in the steeping and in this event the effect on the site would be significant with a peak velocity exceeding 0.03m/s maintaining a residual flood hazard as significant and a potential depth of 0.0 – 0.25m, The bank condition however is considered good and the annual probability remains Low.

12.2 Flooding Effect Tidal

12.2.1 The flooding effect on the site places the site in a EA zone 3 flood risk area the risk identified by EA has probability of occurring of 0.5% in any given year there is likely to be advance warning as the most likely event scenario would be when heavy rain fall storm and high tide occur simultaneously an event the EA can predict with some accuracy the depth given the distance to travel and the extent of the flat fen area is predicted to be shallow and of low velocity.

12.3 Flooding Effect Tidal

12.3.1 The flooding from local drains is less easy to predict as it could occur at any time during heavy rain if a drain has become blocked, the IDB have a regular maintenance program in place, on site drainage should be inspected at least annually which will mitigate this event.

13.0 Assessment of the Actual Risk and Its Implications on the Site

13.1 Assessment of the Actual Risk and Its Implications on the Site

13.1.1 It is clear that the site is located in Zone 3 as identified in the South Holland SFRA. The actual risk is identified as medium its implication for the site given the proposed and existing use should not prevent a planning application being approved.

14.0 Climate Change

14.1 Climate Change

14.1.1 Currently the assumption is that climate change will impact on global sea levels and impact subsequently on surge tides and an increase in significant storm events. The future risk is therefore increased. The design of new any drainage system should have a 30% allowance for climate change.

The flood risk projected depths are to be based on 2115 predictions.

15.0 Mitigation Measure

15.1 Mitigation Measures

15.1.1 Given the Zone 3 risk of the site there are no specific mitigation measures required apart from provision of an adequate drainage system and adequate resilient construction methods. Refer also to para 19.0

15.1.2 It is recommended that the project proposals are drained, with roof water and clean areas being discharged via soakaway and ultimately to surface water open drainage system maintained by the IDB. Soakaways are to be designed following percolation test.

15.1.3 The development area is footpath and roofs and none contain sleeping accommodation. As there is medium risk of the site being flooded, there are no particular measures proposed in accordance with Environment Agency Standing Advice. Floor level set not lower than existing and flood resilience techniques applied. The premises are advised to register for the EA early warning service for commercial premises in accordance with Lincolnshire.

15.1.4 The FRA identifies existing finished floor levels (FFL) in the complex to be generally in the region of 2.30m above ordnance datum (AOD).

15.1.5 The proposed floor levels are 2.40m ODN.

15.1.6 It is recommended that flood resilient construction techniques be adopted as stated in the guidance document 'Improving the Flood Performance of New Buildings – Flood Resilient Construction' by Communities and Local Government. Based on the documents guidance and projected flood level, it is understood this scheme should adopt a water entry strategy. On this basis, the development would adopt a number of the principles. The measures will include the use of closed cell insulation to composite panel walls with no soft finishes internally. Electric sockets data points and any new mechanical services will be placed at a minimum of 1125mm above FFL where possible and feeds are to drop from high level.

Justification extract from SHDC planning policy

Flooding

3.4.8 A development will make buildings and places more resilient to flooding by, for example, raising the floor level, and adapting the internal materials, electrical

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South East Lincolnshire Local Plan 2011-36

circuits and plumbing to cope better with any flood event. These issues may be successfully incorporated in buildings that follow traditional or contemporary design in accordance with Building Regulations. In addition, owing to flood risk new activities may need to be deterred in certain areas based on their intrinsic hazard from water. The hazard may result from a combination of the activity type, its duration and the potential for failure of flood-control measures.

16.0 Pollution

16.1 Existing

The existing site is roof and yard there is no anticipated significant pollution effects not already controlled by good practice.

16.2 Construction

The possibility exists for silt or other pollutants to build up during construction. Flooding during the construction phase will need to be considered as there will be a possibility of the site becoming flooded during excavation works for the construction phase. Risk assessments and method statements should ensure not only that the site remains water free, but any construction work dewatering does not contaminate local receptors. The use of temporary bunding and settlement lagoons should be considered during inclement weather .

16.3 Post Construction

There is little potential for contaminated or dirty water from operational surfaces.

16.4 Pollution Mitigation

16.4.1 Construction

Construction sequence, temporary bundage and settlement tanks should be considered and implemented during the works. Full reference should be made to PPG 6 Working on Construction and Demolition sites and Environmental Good Practice on Site 3rd Edition 2010.

The selection of a contractor to carry out the works must show consideration of the contractors proposals for pollution control during the works. A detailed spill action plan will be required to be put in place prior to construction.

16.4.2 Post Construction

Roof water and water from clean areas only are allowed to enter the receptor.

16.4.3 Levels and Precautions

The design level will be set at 2.400 m OND ie level with existing to provide a level floor throughout to enable vehicular access and operation throughout the building at one level and as required.

16.4.4 Proposed Drainage

The proposed drainage will be clean water drainage restricted to flows from roofs where there is no possibility of becoming contaminated by accidental spillage or dirty vehicles.

It is proposed to retain the existing drainage system apart from areas disturbed by the works where it will be repaired or replaced.

17.0 Drainage Solution

17.1 Drainage Solution

The proposal is to utilize the existing pasture as soakaways outfall which is to be designed to accept water from roofs

18.0 Environment Agency

18.1 Environment Agency

18.1 Environment Agency 16.2 Environment Agency

Hazard mapping - breaching.

> year 2115 0.5% (1 in 200) chance event

> year 2115 0.1% (1 in 100) chance event

The site is not affected by breaching for the present day (2006) scenarios.

Environment Agency predictions of flood depth are predicted to be depth of 0.00 – 0.25m resulting in flood water levels of 2.55m ODN

Appendix J contains Environment Agency predictions

19.0 FRA and paragraph 30 – 32 Flood risk and coastal change.

19.1 Resilient measures

- Robust construction consisting of steel frame building with solid concrete floors and metal cladding - insulation to be closed cell construction and non absorbent.

- Services – water and gas stop taps shall be 700mm above floor level.

- Electric distribution boards to be between 1250 and 1350mm above floor level.

19.2 Floor Levels

- The proposal is for farm premises and is intended for sales and storage of agricultural machinery of a agricultural nature which is the floor level will require to be level with outside ground level for vehicle access.

19.3 Escape Measures

- The premises will register for Environment Agency flood warning scheme and evacuation plan put in place refer to section two .

20.0 Flood Risk Matrix

20.1 Flood Risk Matrix

20.1.1 The flood risk matrix in Appendix F identifies the development of greater than 250sq m in Zone 3 as requiring a flood risk assessment. Consultation with the EA is required. A detailed drainage scheme is required before commencement together with resilience measures as para 19.1.

21.0 Conclusion

21.1 Conclusion

It is our conclusion that the development complies with NPPF and passes, or is not required to pass, the sequential and exemption tests and an adequate drainage. It is our opinion that the is no reason that the planning application should not be approved.

PART TWO

Evacuation Plan

22.0 Introduction

22.1.1 Primarily any plan of action should be aimed at serving the safety of employees and visitors , any written plan should allow adaption's to be considered to ensure best response on an incident by incident basis.

22.1.2 The flood incident differs significantly from a fire incident and this cannot be emphasised enough. The warnings and evacuation in the event of fire are intended to remove the occupants off to a safe place as soon as possible ideally in less than 3 minutes. Given the prevailing conditions during a flood event this is very unlikely to be the best action to be taken. Staff and employees are in the first instance to remain in the building.

23.0 Risks

23.1.1 There are other risks involved during a flood event apart from water levels which are not always covered, for example when the flood is likely to occur.

- During heavy rain
- High winds
- Power failure
- Cold weather
- Dark during winter months
- Fast moving water
- Hidden hazards in water (ie missing manhole covers, kerbs etc)

23.1.2 A fire tends to be very localised with only a few minutes warning for a flood to raise the alarm and carry out evacuation by fire drill is wholly inappropriate any may put the occupants at greater risk.

23.1.3 A flood event other than localised surface water from a blocked drain for example is likely to be more regional has greater warning time probabilities and requires a considered evacuation response.

23.1.4 During a flood alarm you should not:-

- Congregate outside
- Leave belongings behind (particularly outdoor clothing and lunch boxes)
- Send employees home to an environment at greater risk.

23.1.5 To emphasis should be on a calm considered response and remaining on site in first instance is likely to be the best response as rapid onset of hypothermia is a real risk in wet cold conditions.

24.0 FLOOD ACTION AND EVACUATION RESPONSE

24.0 Preparation

24.1.1 The site is registered with the Environment Agency Flood Line (0845 988 1188) and will receive
- automated warnings to the main switchboard together with text alerts to main reception

25.1 Monitoring

25.1.2 Available sources of information

Environmental Agency website; www.environment-agency.gov.uk/flood
Environmental Agency flood line ; 0845 988 1188

BBC Radio Lincolnshire 94.9FM

Lincs FM 102.2FM (live daytime only)

Met Office website; www.metoffice.gov.uk

Highways Agency website; www. highwaysagency.gov.uk

Other sources of information:-

Lincolnshire County Council

Check for flooding - GOV.UK (www.gov.uk)

Sign up for flood warnings - GOV.UK (www.gov.uk)

How to plan ahead for flooding - Check for flooding - GOV.UK (check-for-flooding.service.gov.uk)

26.2 ACTION

26.2.1 Refer to YOUR FLOOD ACTION PLAN and carry out actions now.

27.0 ENVIRONMENT AGENCY FLOOD WARNING ALERTS

27.1.1 The Environment Agency has for code levels relating to levels of risk and suggested actions, it should be noted that these can be issued in any order.

understand your flood warning codes

Our warning service has three types of warnings - Flood Alert, Flood Warning and Severe Flood Warning - that will help you prepare for flooding and take necessary actions.

ONLINE FLOOD RISK FORECAST

What it means

Be aware.
Keep an eye on the weather situation.

When it's used

Forecasts of flooding on the Environment Agency website are updated a least once a day.

What to do

- Check weather conditions.
- Check for updated flood forecasts on our website.

FLOOD ALERT

What it means

Flooding is possible.
Be prepared.

When it's used

Two hours to two days in advance of flooding.

What to do

- Be prepared to act on your flood plan.
- Prepare a flood kit of essential items.
- Monitor local water levels and the flood forecast on our website.

FLOOD WARNING

What it means

Flooding is expected. Immediate action required.

When it's used

Half an hour to one day in advance of flooding.

What to do

- Move staff, stock and valuables to a safe place.
- Turn off gas, electricity and water supplies if safe to do so.
- Put flood protection equipment in place.

SEVERE FLOOD WARNING

What it means

Severe flooding. Danger to life.

When it's used

When flooding poses a significant risk to life.

What to do

- Stay in a safe place with means of escape.
- Be ready should you need to evacuate.
- Co-operate with the emergency services.
- Call 999 if you are in immediate danger.

WARNING NO LONGER IN FORCE

What it means

No further flooding is currently expected in you area.

When it's used

When river or sea conditions begin to return to normal.

What to do

- Be careful. Flood water may still be around for several days.
- If you've been flooded, ring your insurance company as soon as possible.

28.0 FLOOD ACTION PLAN

28.1.1 In the event of a flood warning being issued, the Environment Agency aim to issue warning at various levels, this information is good but cannot be guaranteed so some judgement based on other to conditions is required.

Flood alert - Prepare

- prepare a bag that includes medicines and insurance documents
- check flood warnings

Flood warning - Act

- turn off gas, water and electricity
- move things upstairs or to safety
- move family, pets and car to safety

Severe flood warning - Survive

- call 999 if in immediate danger
- follow advice from emergency services
- keep yourself and your family safe

28.1.2 Instigate actions outlined in Environment Agency flood alert and alert all members of staff of the condition and brief them on the possibility of escalated action. Monitor situation on Radio and websites and flood line (it is important not to overuse web and phone functions).

ONLINE FLOOD RISK FORECAST

What it means

Be aware.
Keep an eye on the weather situation.

When it's used

Forecasts of flooding on the Environment Agency website are updated a least once a day.

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Half an hour to one day in advance of flooding.

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- Move staff, stock and valuables to a safe place.
- Turn off gas, electricity and water supplies if safe to do so.
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SEVERE FLOOD WARNING

What it means

Severe flooding. Danger to life.

When it's used

When flooding poses a significant risk to life.

What to do

- Stay in a safe place with means of escape.
- Be ready should you need to evacuate.
- Co-operate with the emergency services.
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WARNING NO LONGER IN FORCE

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When it's used

When river or sea conditions begin to return to normal.

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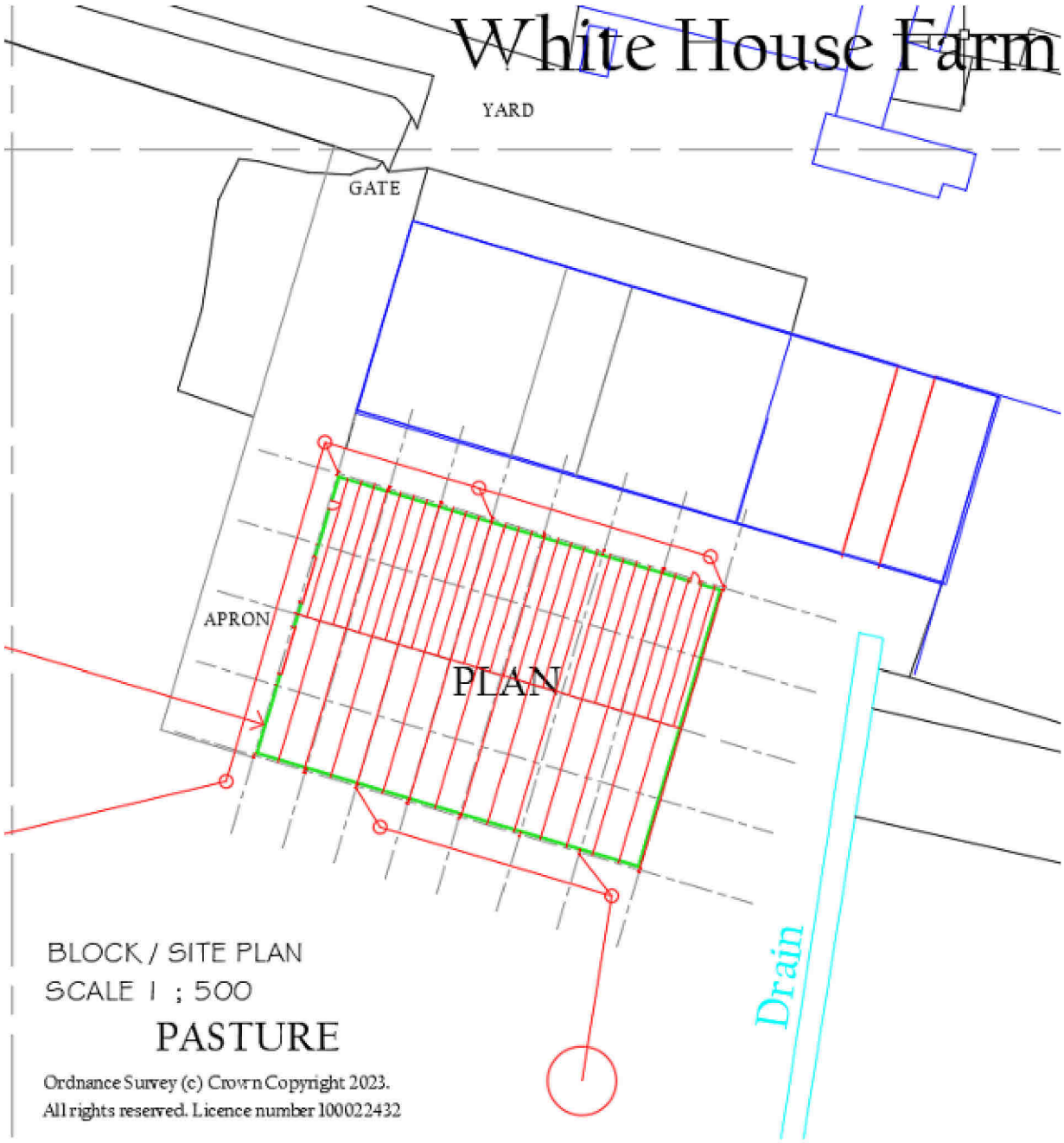
- If you've been flooded, ring your insurance company as soon as possible.

Appendix A

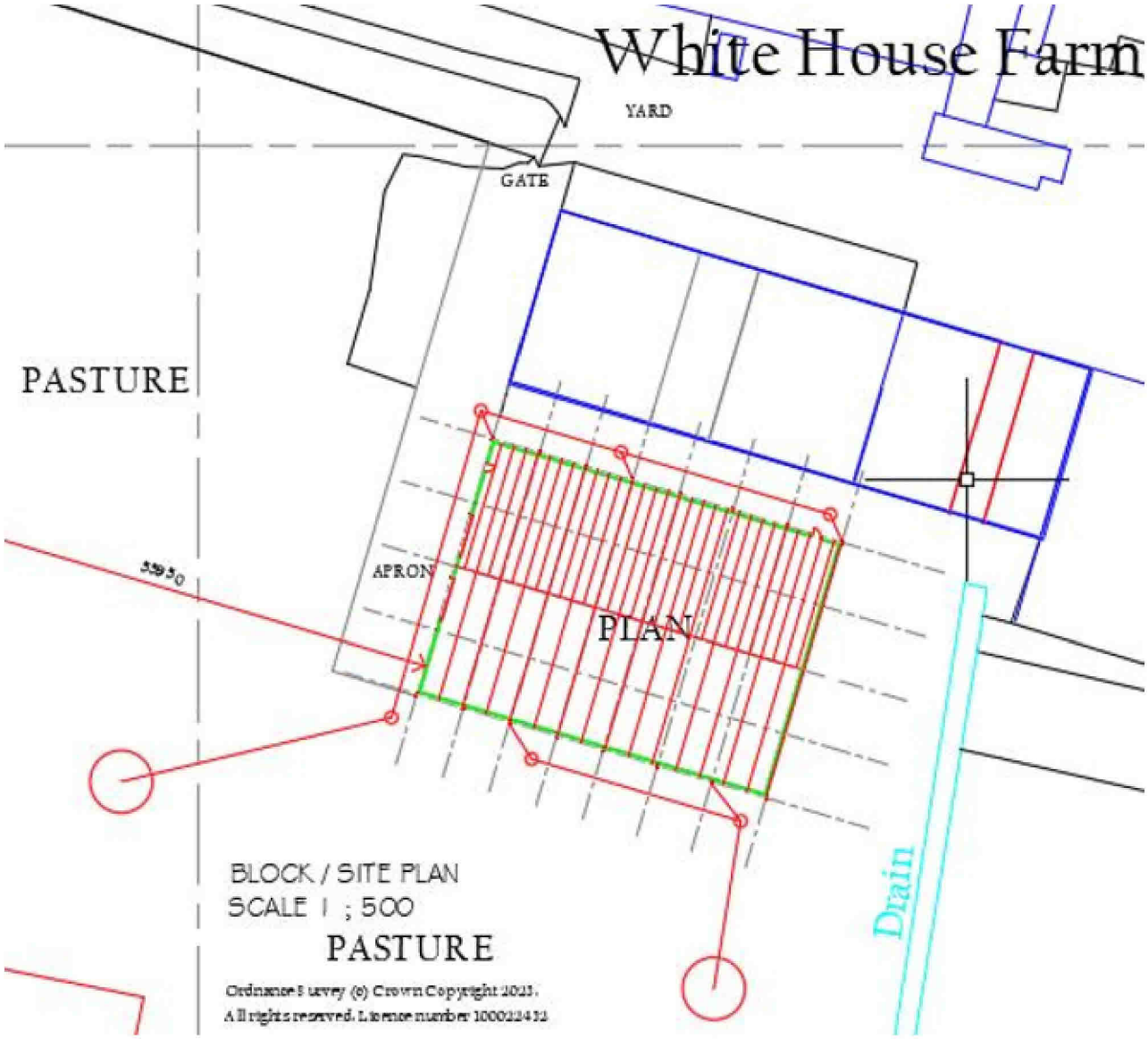


BLOCK PLAN

Appendix B

PROPOSED SITE LAYOUT

Appendix C



DRAINAGE PLAN

Appendix D

LOCATION PLAN

Appendix E

Please refer to the National Planning Practice Guidance (Table 3) for advice on when the Sequential and Exception Tests are applicable	Environment Agency Environmental Permitting Regime distance - any works within 8m of fluvial Main River, or 16m of tidal defences (including culverting or control of flow of any river or stream)	Danger to ALL (Hazard Rating >2)	Danger to MOST (Hazard Rating 1.25 - 2)	Danger to SOME (Hazard Rating 0.75 - 1.25)	Low Hazard (Hazard Rating 0 - 0.75)	Flood Zone 3	Flood Zone 2
Water Compatible (excluding development that includes essential ancillary sleeping or residential accommodation)	Consult EA	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation	No Comment	No Comment
Major & Non-major* 'Less Vulnerable' uses, e.g. commercial/industrial development	Consult EA	Consult EA	Appropriate Mitigation	Appropriate Mitigation	No Comment	No Comment	No Comment
Tidal Risk Scenario advice only. New short-let **Camping and Caravan Sites** (incl. log cabins & chalets) - subject to flood warning and evacuation plan	Consult EA	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation
Fluvial Risk Scenario advice only. New short-let **Camping and Caravan Sites** (incl. log cabins & chalets) - subject to flood warning and evacuation plan	Consult EA	EA **OBJECTS** to the principle of development due to risk to life	EA **OBJECTS** to the principle of development due to risk to life	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation
Change of Use - Less Vulnerable to More Vulnerable or within More Vulnerable category, involving increase in risk to people - *please see note for other categories & exclusions*	Consult EA	Consult EA	Consult EA	Appropriate mitigation	Appropriate mitigation	No Comment	No Comment
Non-major* 'More Vulnerable' uses, including residential development & residential holiday accom. (less than 10 dwellings/units or less than 0.5ha in size), *except short-let caravan sites - see A5 & A6 above*	Consult EA	Consult EA	Appropriate Mitigation	Appropriate Mitigation	Appropriate Mitigation	No Comment	No Comment
Major* 'More Vulnerable' uses including residential development & residential holiday accom (not including camping/caravan sites) - greater than 10 dwellings/units or 0.5ha in size	Consult EA	Consult EA	Consult EA	Consult EA	Consult EA	Consult EA	No Comment
Essential Infrastructure	Consult EA	Consult EA	Consult EA	Consult EA	Consult EA	Consult EA	No Comment
Highly Vulnerable' uses, e.g. caravans, mobile homes and park homes intended for permanent residential use - With the Exception of buildings and infrastructure explicitly for use in emergencies (which should be referred to the EA for bespoke advice)	Consult EA	**Object - Contrary to NPPF**	**Object - Contrary to NPPF**	**Object - Contrary to NPPF**	**Object - Contrary to NPPF**	**Object - Contrary to NPPF**	Consult EA

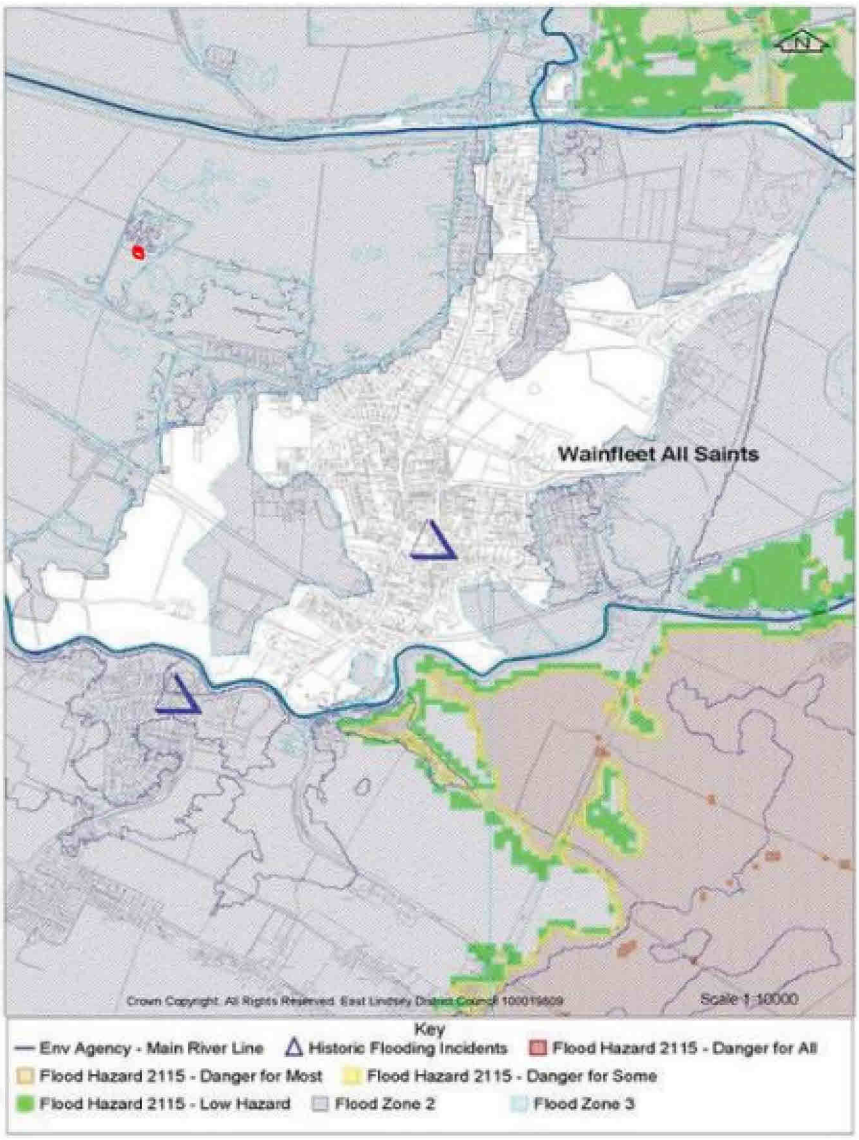
DEVELOPMENT FLOOD MATRIX

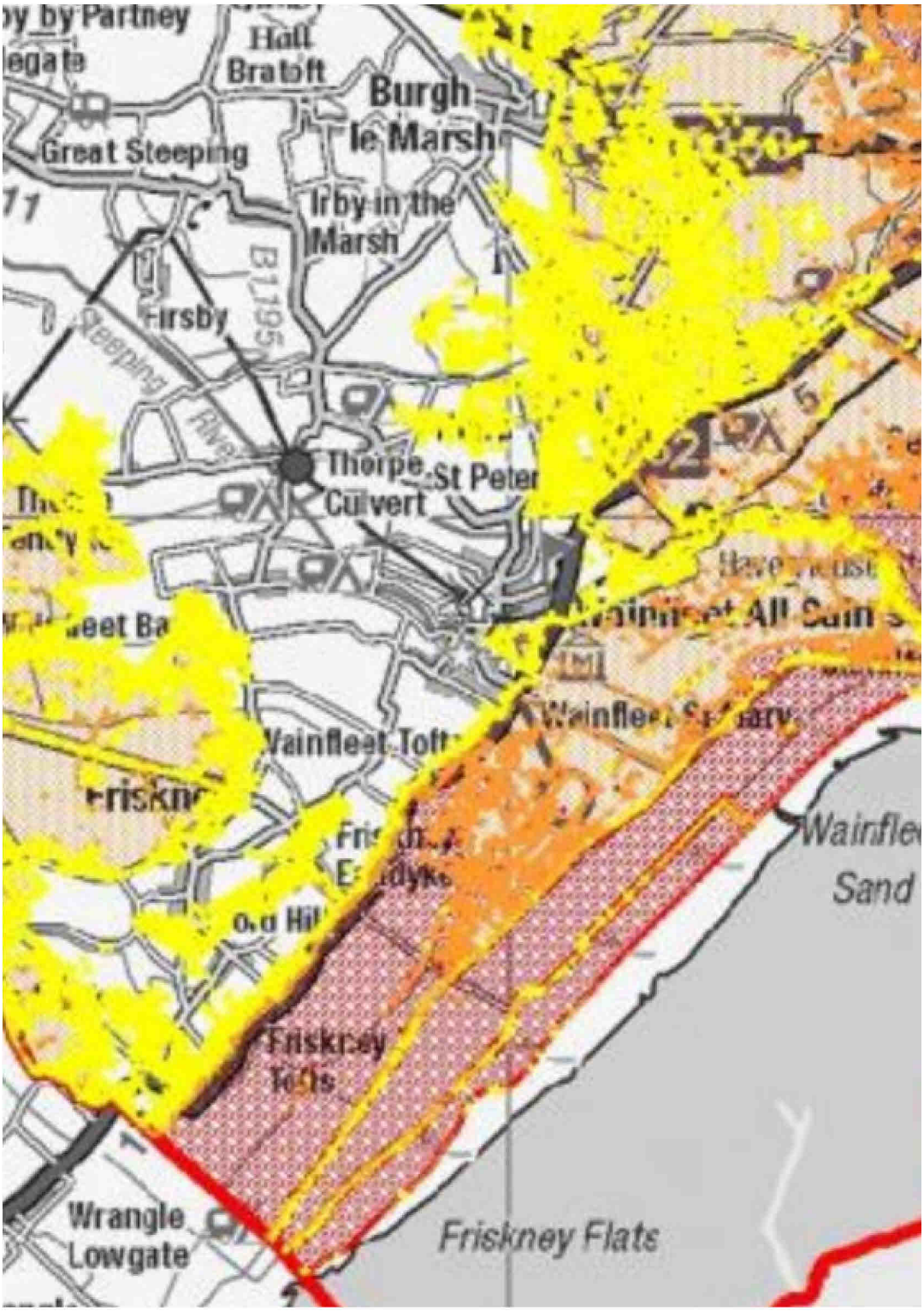
The development is in 'danger for most' the project is category less vulnerable – standing advice – mitigation measures

Appendix F

WAINFLEET ALL SAINTS

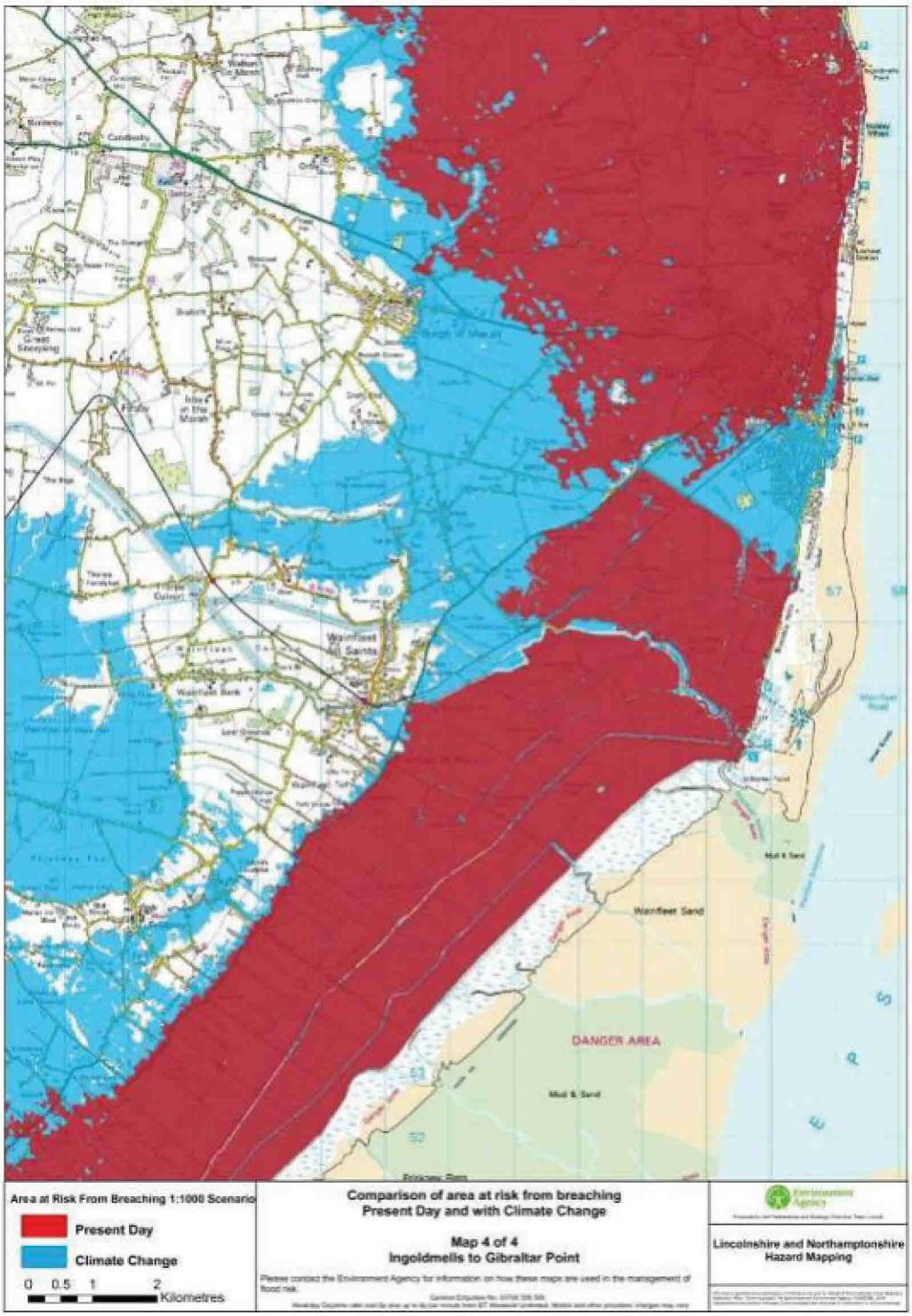
Wainfleet All Saints lies between the River Steeping and the Wainfleet Relief Channel and about 4 ½ miles from the sea and the likely extent of flooding from both sources is shown below. The Environment Agency's Hazard Maps show that Wainfleet is not at risk of coastal flooding. However, because of the proximity of the Steeping and Relief Channel (EA main rivers) fluvial flooding remains a threat to the village and, drainage improvements may be required to facilitate future development. Recent work re-modelling the R. Steeping has been undertaken and will be included in this document once available.





East Lindsey District Council Strategic Flood Risk Assessment the site assessed as zone 2

MAP 6 Present Day Flood Risk Ingoldmells to Friskney



Residual Flood hazard from tidal breach red is present day and blue taking into account climate change

Residual Peak Depth 2115 0.5% tidal / 1.0% fluvial 2115 event probability

Appendix G

Standard notice *[not for use with Special Data, Personal Data or unlicensed 3rd party rights]*

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Contact: enquiries@environment-agency.gov.uk 03708 506506

Flooding

3.4.8 A development will make buildings and places more resilient to flooding by, for example, raising the floor level, and adapting the internal materials, electrical

circuits and plumbing to cope better with any flood event. These issues may be successfully incorporated in buildings that follow traditional or contemporary design in accordance with Building Regulations. In addition, owing to flood risk new activities may need to be deterred in certain areas based on their intrinsic hazard from water. The hazard may result from a combination of the activity type, its duration and the potential for failure of flood-control measures.

10. Mitigation/Standing Advice

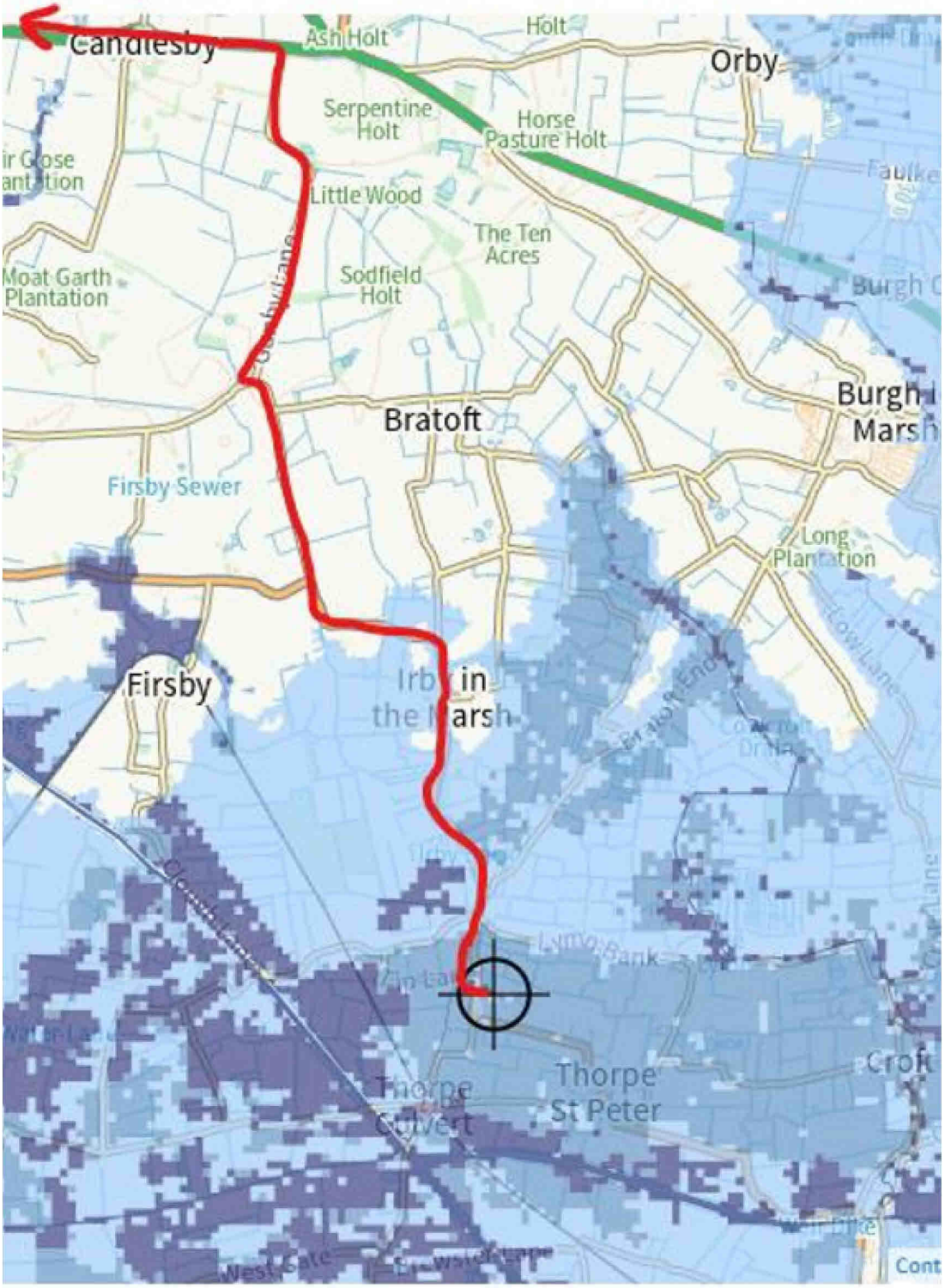
10.1.1 The Environment Agency and the Local Planning Authorities have produced local flood risk standing advice in the form of a matrix. This document has been prepared to assist in the interpretation of the Strategic Flood Risk Assessment for individual developments, whilst also providing pre-application advice. This matrix forms part of the Strategic Flood Risk Assessment and is contained in Appendix C.

10.1.2 Please note that single storey proposals will be expected to incorporate mitigation for the extreme 1 in 1000 (0.1%) scenario.

10.1.3 The Environment Agency has also produced basic guidance, aimed at developers and applicants on how to complete a Flood Risk Assessment.

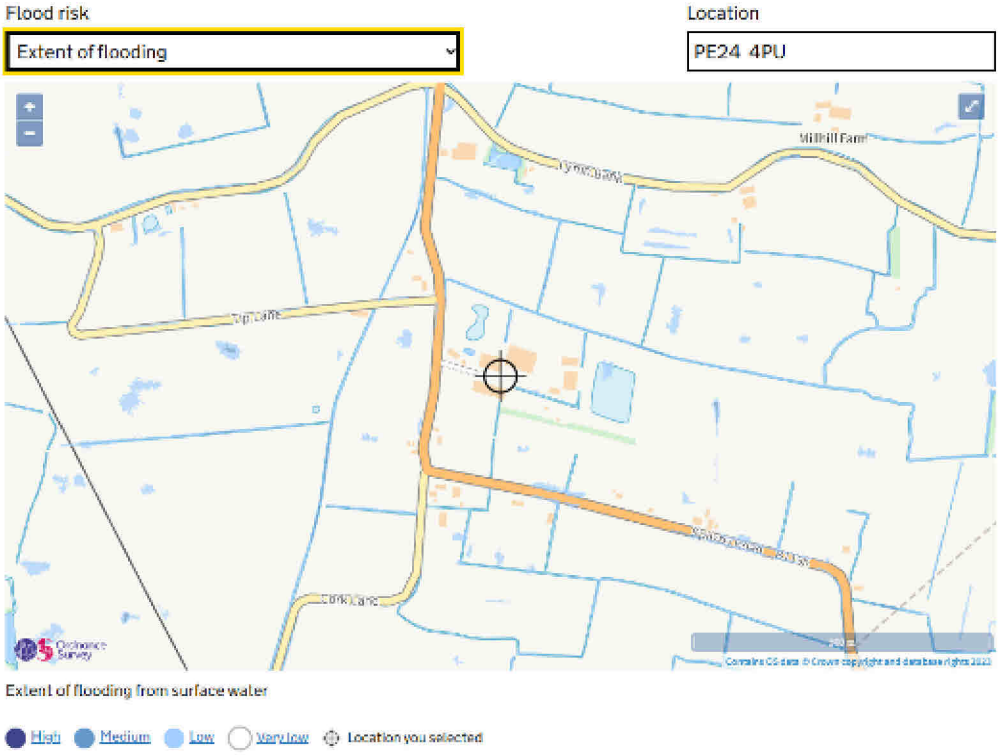
10.1.4 Developers are also advised to refer to the DCLG document 'Improving the flood performance of new buildings: flood resilient construction'. This document aims to provide guidance to developers and designers on how to improve the resilience of new properties in low or residual flood risk areas by the use of suitable materials and construction details. These approaches are appropriate for areas where the probability of flooding is low (e.g. Flood Zone 1) or areas where flood risk management or mitigation measures have been put in place.

Appendix H

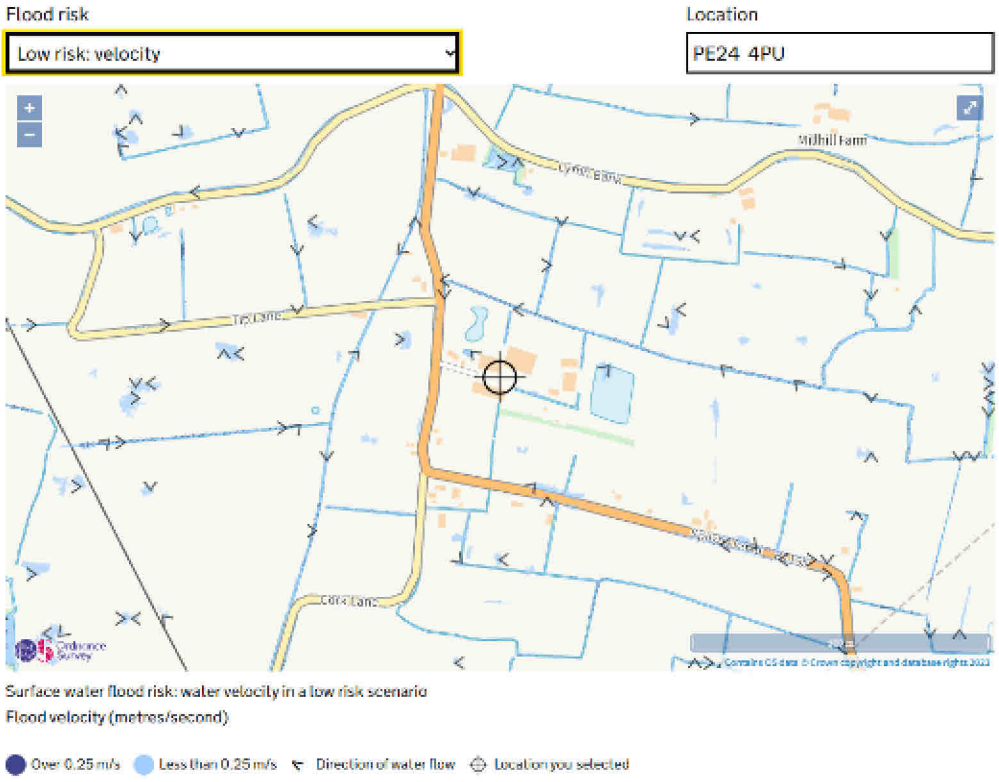


Possible evacuation routes

Appendix I



EXTENT OF FLOODING SURFACE WATER



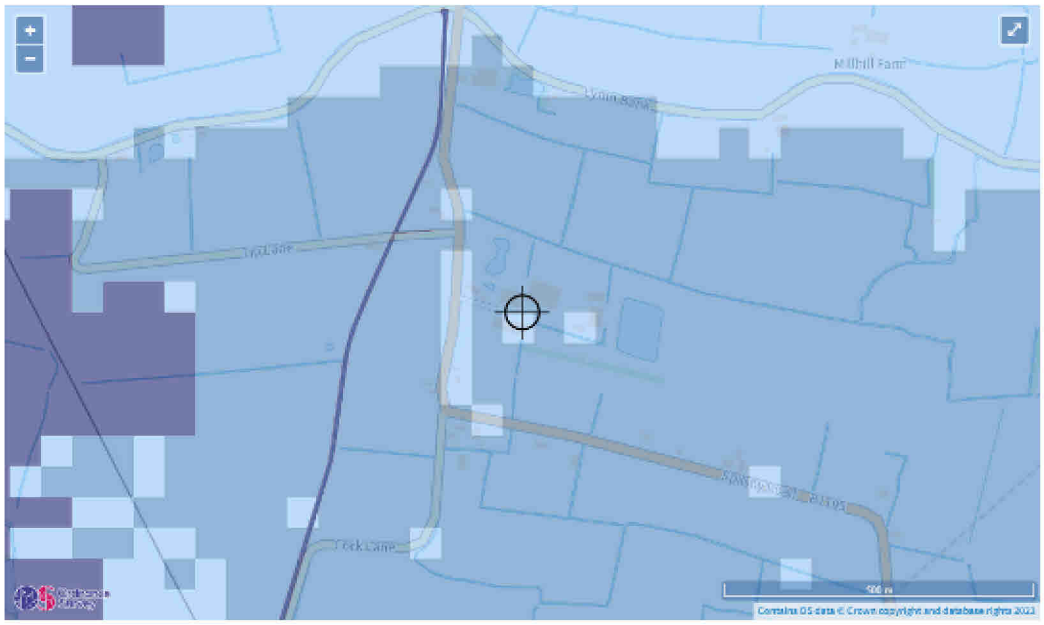
LOW RISK VELOCITY FLOODING SURFACE WATER

Flood risk

Extent of flooding

Location

PE24 4PU



Extent of flooding from rivers or the sea

High Medium Low Very low Location you selected

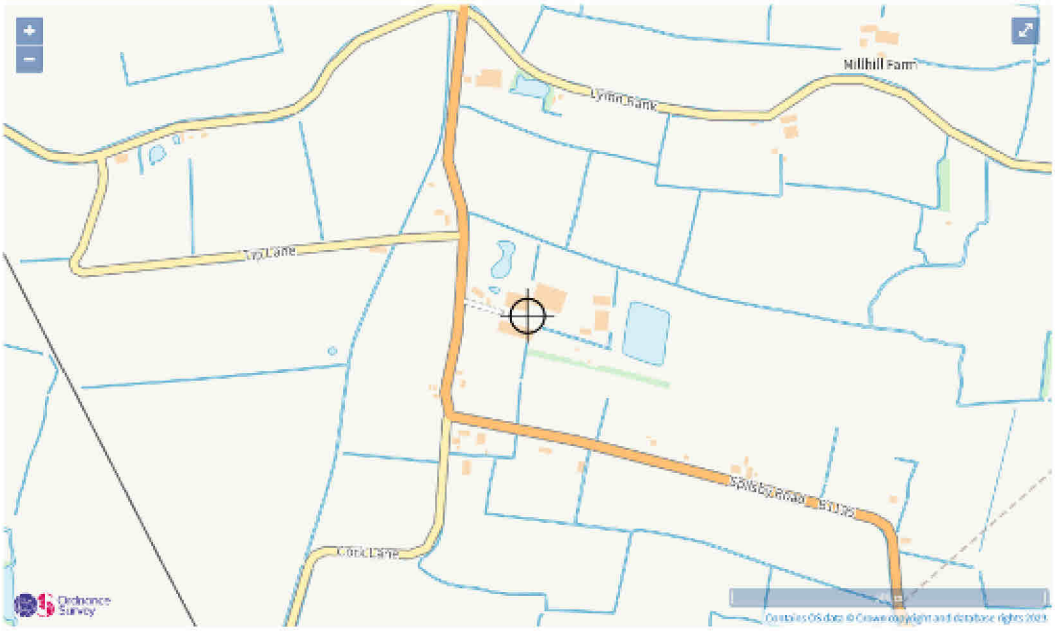
EXTENT OF FLOODING FROM RIVERS OR THE SEA

Flood risk

Extent of flooding

Location

PE24 4PU



Maximum extent of flooding from reservoirs:

when river levels are normal when there is also flooding from rivers Location you selected

EXTENT OF FLOODING FROM RESERVOIRS

Appendix J

davidbiggadike@btconnect.com

Our ref: CCN-2023-305777

Date: 13/04/2023

Dear David,

Provision of Flood Risk Information for Spilsby Road, Thorpe St Peter.

Thank you for your request for our flood risk information for the above site. The information is set out below and attached. It is important you read any contextual notes on the maps provided.

If you are preparing a Flood Risk Assessment (FRA) for this site, please note this information may not be sufficient by itself to produce an adequate FRA to demonstrate the development is safe over its lifetime. Additional information may be required to carry out an appropriate assessment of all risk, such as consequence of a breach in defences.

We aim to review our information on a regular basis, so if you are using this data more than twelve months from the date of this letter, please contact us again to check it is still valid.

Please read the letter in full as the information covered has been updated in **March 2023.**

1. Flood Map

The attached map includes the current Flood Map for your area. The Flood Map indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring for fluvial (river) flooding. It also shows the extent of the Extreme Flood Outline which represents the extent of a flood with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

In some locations, such as around the fens and the large coastal floodplains, showing the area at risk of flooding assuming no defences may give a slightly misleading picture in that if there were no flood defences, water would spread out across these large floodplains. This flooding could cover large areas of land but to relatively shallow depths and could leave pockets of locally slightly higher land as isolated dry islands. It is important to understand the actual risk of the flooding to these dry islands, particularly in the event of defence failure.

The Flood Map also shows the location of formal raised flood defences and flood storage reservoirs. It represents areas at risk of flooding for present day only and does not take account of climate change.

The Flood Map only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered flooding may occur from other sources such as surface water sewers, road drainage, etc.

2. Historic Flood Event Outlines

The area was previously known to have flooded in June 2019. A copy of the Historic Flood Event Outlines Map showing the extent of previous recorded flooding in your area is attached. This only covers information we hold and it is possible recent flooding may have occurred which we are currently investigating, therefore this information may be subject to change. It is possible other flooding may have occurred which other organisations, such as the Lead Local Flood Authority (ie top tier council), Local Authority or Internal Drainage Board (where they exist), may have records.

3. Schemes in the area

The Steeping River Catchment Steering Group, which is formed from flood risk management authorities and local community representatives, has published a Catchment Action Plan (CAP). This has identified sustainable measures that can be taken to manage the risk of flooding in the short, medium and long term. Partners are now working together to deliver these measures. Targeted dredging has already been completed which, when combined with other actions, will help to reduce the risk of flooding. The CAP also includes an action to improve the resilience of the raised defences which protect the west of Wainfleet All Saints. The business case for government funding for this project is currently being developed.

4. Fluvial Flood Risk Information

This site is considered to be at risk of flooding from main rivers.

The site may also be at risk from local ordinary watercourses for which other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist) have responsibility.

4.1 Fluvial Defence Information

The existing fluvial defences reducing the risk of flooding from main river to this site consist of earth embankments. They are in fair condition and reduce the risk of flooding (at the defence) to a 4% (1 in 25) chance of occurring in any year. We inspect these defences routinely to ensure potential defects are identified.

4.2 Fluvial Modelled Levels and Flows

Available modelled fluvial flood levels and flows for the model nodes shown on the attached map are set out in the data table attached. This data is taken from the model named on the data table, which is the most up-to-date model currently available.

Please note these levels are “in-channel” levels and therefore may not represent the flood level on the floodplain, particularly where the channel is embanked or has raised defences.

Our models may not have the most up to date climate change allowances. In time we will update our models for the latest allowances. You should refer to 'Flood risk assessments: climate change allowances' to check if the allowances modelled are appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

4.3 Fluvial Modelled Flood Extents

Please find attached a map showing available modelled flood extents, taking into account flood defences, for your area. This data is taken from the model named on the map, which is the most up-to-date model currently available.

In some cases the flood extents shown may not be from main river, but may be from other sources such as IDB lowland drainage networks.

4.4 Fluvial Hazard Mapping

For certain locations we have carried out modelling to map the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from overtopping and / or breaching of defences at specific locations for a number of scenarios.

At present this information is available for fluvial flood risk in Northampton, Lincoln, Wainfleet and some isolated rural locations.

The number of locations we have this information for is expected to increase in time.

The attached maps show the maximum values of flood depth, velocity, and hazard rating (danger to people) resulting from breaching of the defences at specific locations for the scenarios below. For some locations the breach mapping also includes flooding from overtopping if this is expected in that scenario.

- Year 2011 1% (1 in 100) chance
- Year 2011 0.1% (1 in 1000) chance
- Year 2115 1% (1 in 100) chance
- Year 2115 0.1% (1 in 1000) chance

5. Tidal Flood Risk Information

This site is considered to be at risk from tidal flooding.

5.1 Tidal Defence Information

The existing tidal defences protecting this site consist of earth embankments and natural sand dunes which are supplemented by beach foreshore levels.

They are in fair condition and reduce the risk of flooding (at the defence) to a 0.5% (1 in 200) chance of occurring in any year. We inspect these defences routinely to ensure potential defects are identified.

Refer to paragraph 3 for details of any ongoing capital projects to reduce the flood risk to this site.

5.2 Tidal Flood Levels

The attached data sheets show our current best estimate for extreme tide levels.

Please read the information notes on the data sheets.

5.3 Tidal Hazard Mapping

For certain locations we have carried out modelling to map the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from overtopping and / or breaching of defences at specific locations for a number of scenarios.

At present this information is available along the full coastal / tidal floodplain, except the tidal Witham Haven in Boston (upstream of Hobhole) where only breaching and not overtopping has been modelled and the tidal River Welland upstream of Fosdyke Bridge where neither breaching nor overtopping are available.

The number of locations we have this information for is expected to increase in time.

The attached maps show the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from breaching of the defences at specific locations for the scenarios below. For some locations the breach mapping also includes flooding from overtopping if this is expected in that scenario. The location of modelled tidal breaches is shown on a separate attached map.

5.3.1 Tidal Hazard Mapping – Breaches

- Year 2115 0.1% (1 in 1000) chance

Your site is not affected by breaching of the tidal defences for the present day (2006) scenarios.

5.3.2 Tidal Hazard Mapping - Overtopping

The attached maps show the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from simulated overtopping of defences for the following scenarios:

- Year 2115 0.1% (1 in 1000) chance

Your site is not affected by overtopping of the defences for the present day (2006) scenarios.

6. Development Planning

If you would like local guidance on preparing a flood risk assessment for a planning application, please contact our Sustainable Places team at LNplanning@environment-agency.gov.uk. It will help if you mention this data request and attach your site location plan.

We provide free preliminary advice; additional/detailed advice, review of draft FRAs and meetings are chargeable at a rate set to cover our costs, currently £100 (plus VAT) per hour of staff time. Further details are available on our website at https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals.

General advice on flood risk assessment for planning applications can be found on GOV.UK at https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications

Climate change will increase flood risk due to overtopping of defences. Please note, unless specified otherwise, the climate change data included has an allowance for 20% increase in flow. Updated guidance on how climate change could affect flood risk to new development - 'Flood risk assessments: climate change allowances' was published on GOV.UK in **July 2021**. The appropriate updated climate change allowance should be applied in a Flood Risk Assessment.

You should also consult the Strategic Flood Risk Assessment produced by your local planning authority.

7. Data Licence and Other Supporting Information

We respond to requests for recorded information we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

This information is provided in accordance with the Open Government Licence which can be found here: http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

Further information on flood risk can be found on the GOV.UK website at: https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather

8. Other Flood Risk Management Authorities

The information provided with this letter relates to flood risk from main river or the sea. The Flood Map for Surface Water can be viewed at https://www.gov.uk/check-long-term-flood-risk

Additional information may be available from other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist).

I hope we have correctly interpreted your request. If you have any queries or would like to discuss the content of this letter further please contact James Rowett using the email address below and quoting our CCN reference number above.

Yours sincerely,

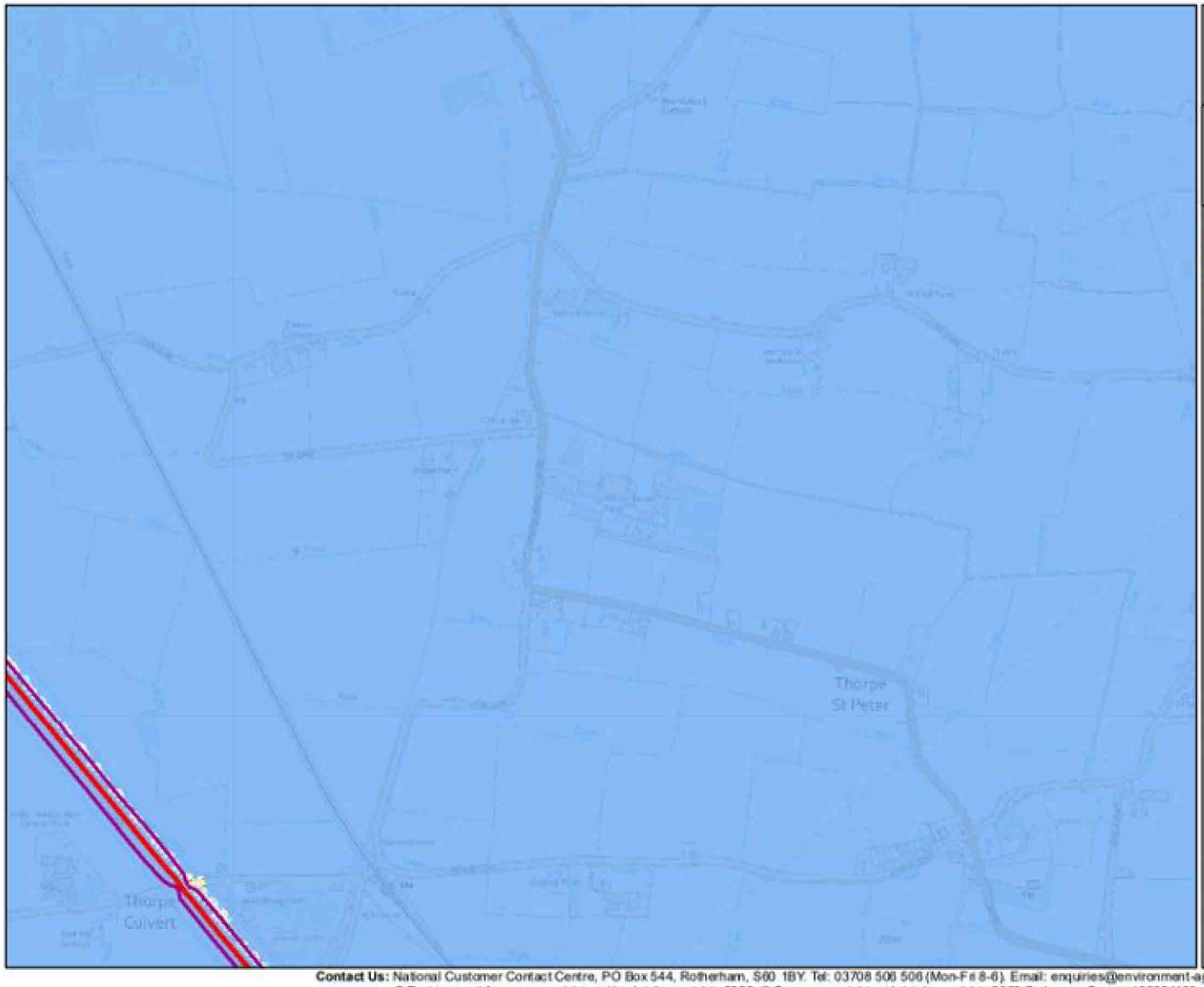
James Rowett BSc(Hons)
South Humber and East Coast
Partnership and Strategic Overview Flood Officer
Lincs and Northants

for Paul Payne
South Humber and East Coast Partnerships and Strategic Overview Team Leader
e-mail PSO_Coastal@environment-agency.gov.uk

Enc.

Flood Map
Historic Flood Event Outlines Map
Modelled Node Points Map
Modelled Fluvial Levels and Flows Data Sheet
Modelled Flood Extent Maps
Hazard Mapping – Fluvial Breaching
Tidal Level Data Sheets - Map and Tables
Tidal Breach Points – Locations Map
Hazard Mapping – Tidal Breaching
Hazard Mapping – Overtopping

Flood Map centred on TF 47689 61428 - created April 2023 [Ref: CCN-2023-305777]



Environment Agency

Scale 1:10,000

N
W E
S

Legend

- Main River
- Raised Defences
- Areas at Risk of Flooding from Rivers and Sea
- Extreme Flood Outline

Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:

- from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year.

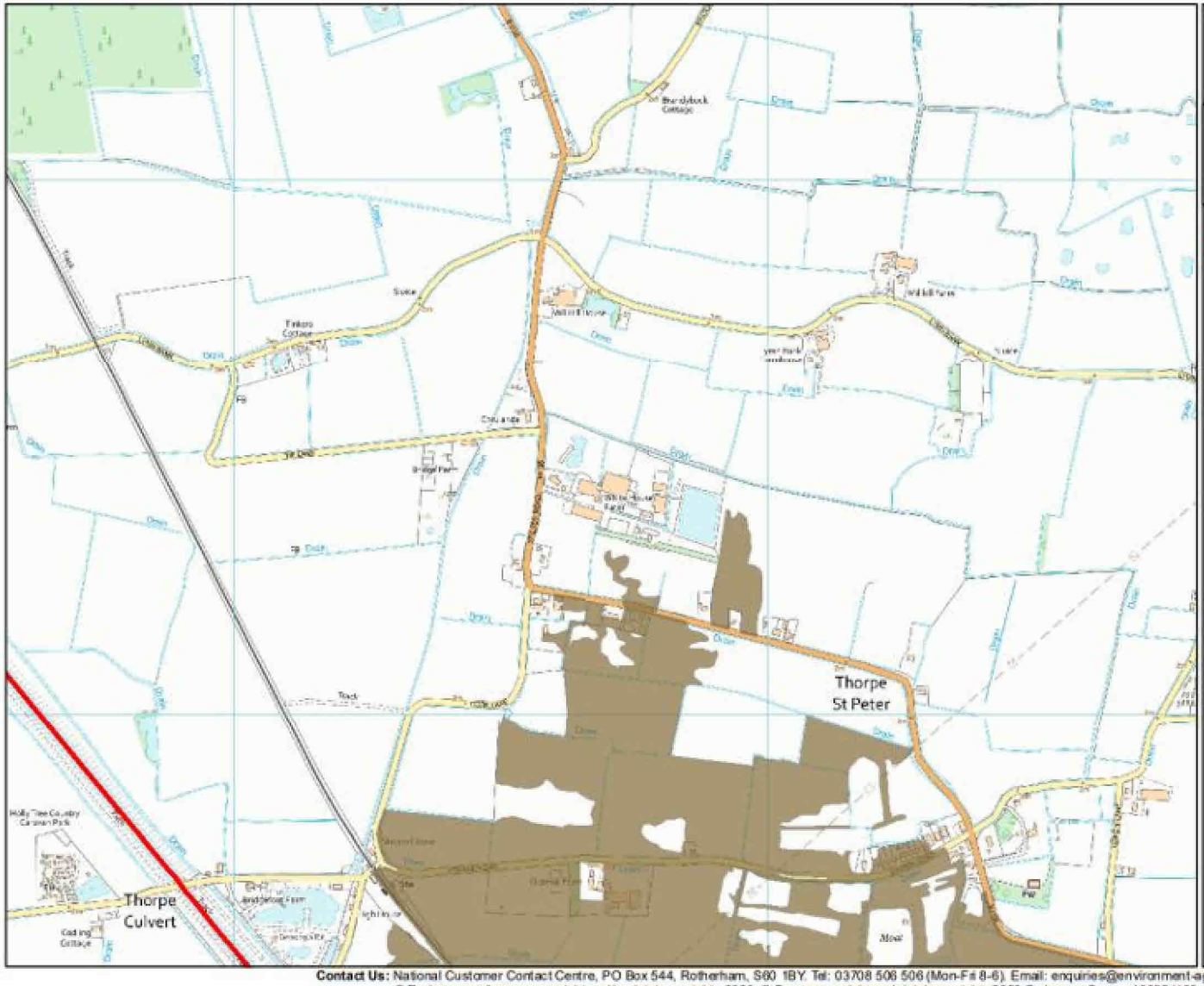
- or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light blue shows the extent of the Extreme Flood Outline, which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Sites outside the two extents, but behind raised defences, may be affected by flooding if the defences are overtopped or fail.

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

Historic Flood Map centred on TF 47689 61428 - created April 2023 [Ref: CCN-2023-305777]



Environment Agency

Scale 1:10,000

N
W E
S

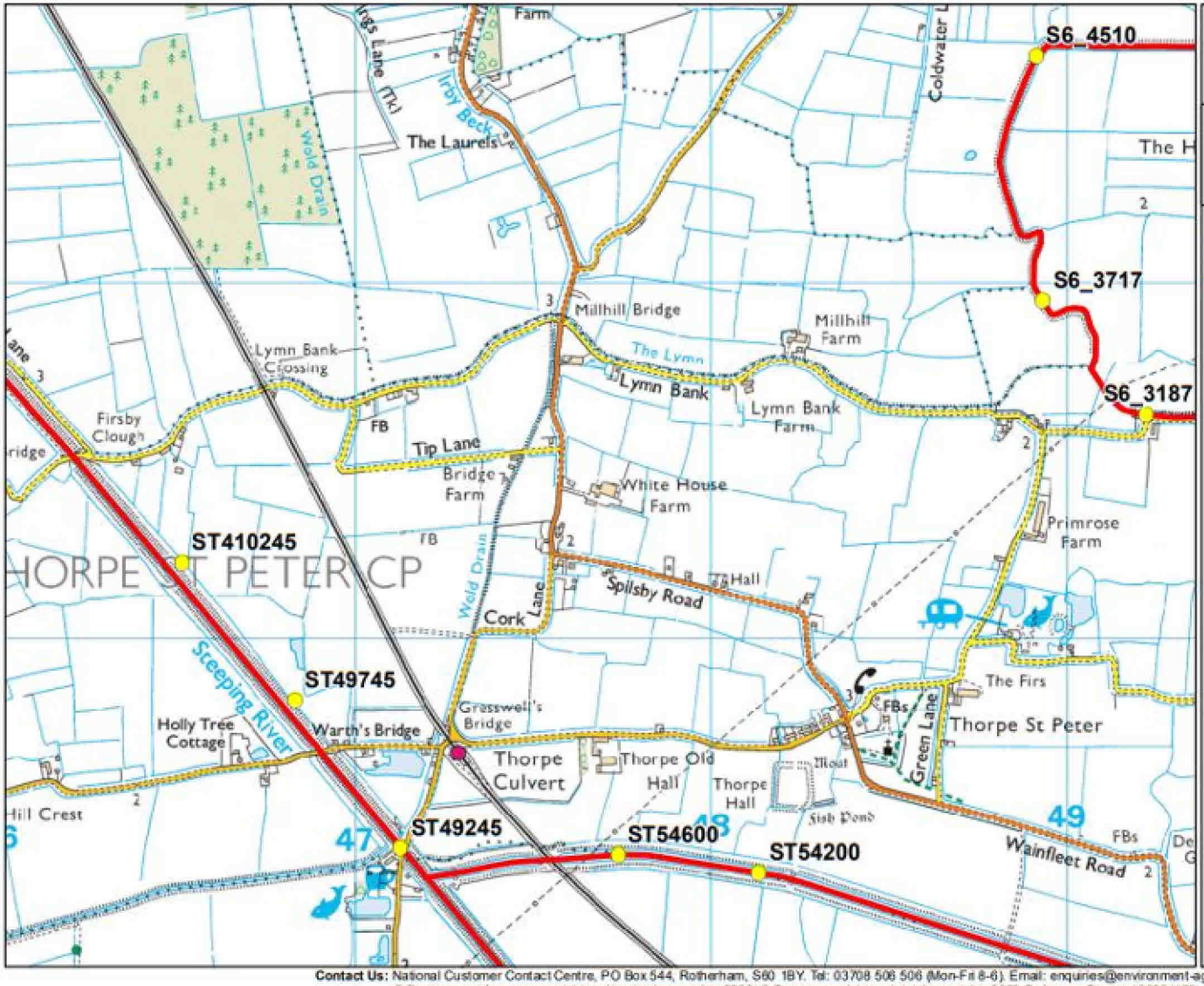
Legend

Main River

2019-June_Steeping River

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

Model Nodes for River Steeping 2009 [CCN-2023-305777]



Environment Agency

Scale 1:15,000

N W E S

Legend

- Model Nodes
- Main River

Environment Agency

Datasheet [Ref: CCN-2023-305777] **Model Name: River Steeping** **Model Date: 2009**

Fluvial Flood Levels (mODN)

The fluvial flood levels for the model nodes shown on the attached map are set out in the table below. They are measured in metres above Ordnance Datum Newlyn (mODN).

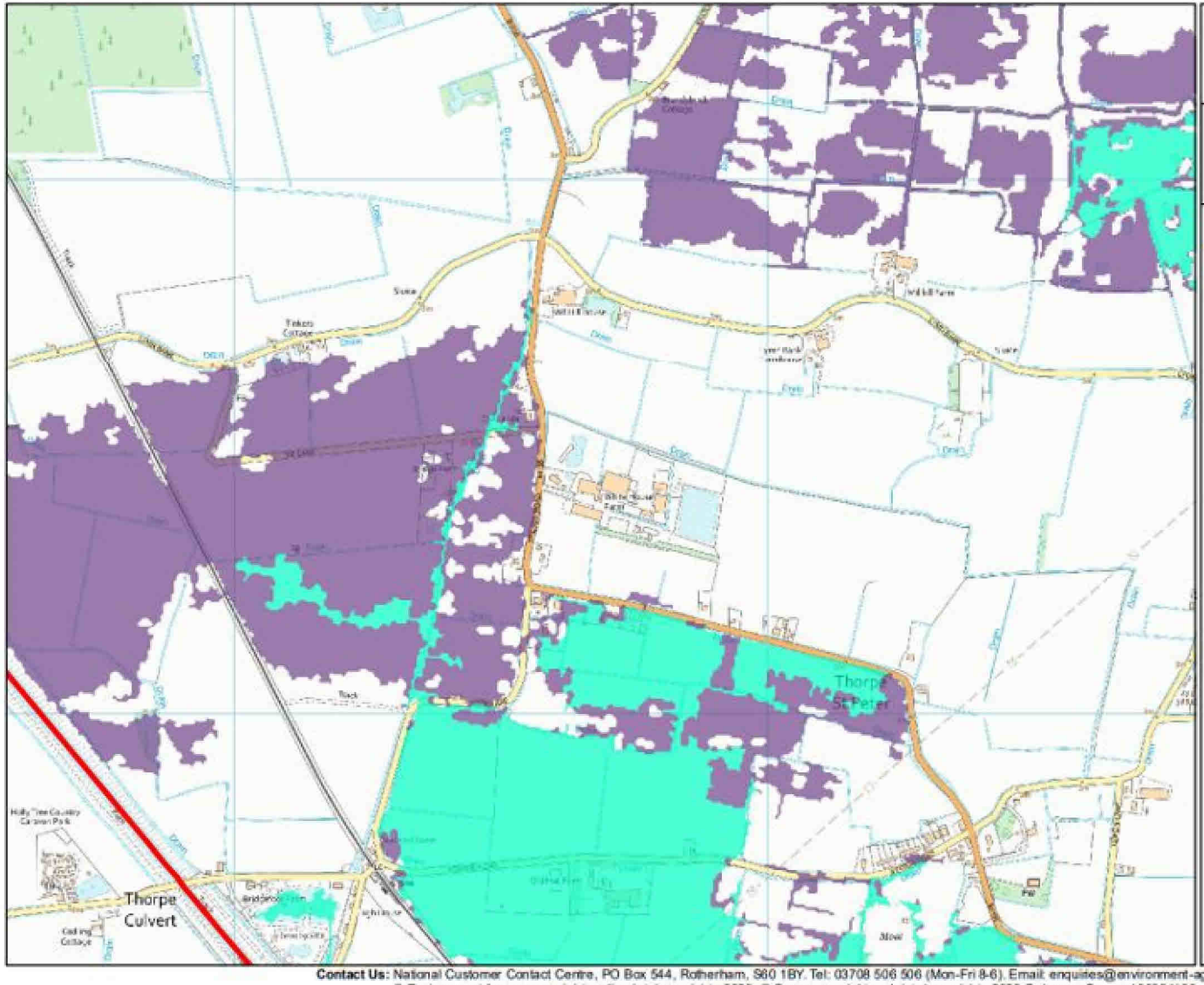
			Annual Exceedance Probability - Maximum Water Levels (mODN)									
Node Label	Easting	Northing	50% (1 in 2)	20% (1 in 5)	10% (1 in 10)	5% (1 in 20)	4% (1 in 25)	2% (1 in 50)	1.33% (1 in 75)	1% (1 in 100)	1% (1 in 100) inc 20% Climate Change	0.5% (1 in 200)
ST410245	546513	361211	3.53	3.88	4.11	4.27	4.34	4.47	4.52	4.54	4.59	4.57
ST49745	546829	360824	3.51	3.86	4.09	4.25	4.32	4.45	4.50	4.52	4.56	4.54
ST49245	547129	360409	3.42	3.77	4.01	4.17	4.24	4.34	4.37	4.39	4.42	4.40
ST54600	547738	360390	3.39	3.70	3.93	4.08	4.12	4.18	4.19	4.19	4.22	4.20
ST54200	548134	360340	3.39	3.70	3.93	4.07	4.12	4.17	4.19	4.19	4.22	4.20
S6_4510	548915	362635	2.12	2.47	2.78	2.95	2.95	2.95	2.95	2.95	2.95	2.95
S6_3717	548934	361947	2.11	2.45	2.77	2.94	2.94	2.94	2.94	2.94	2.94	2.94
S6_3187	549222	361627	2.10	2.44	2.76	2.93	2.93	2.93	2.93	2.93	2.93	2.93

Fluvial Flood Flows (m³/s)

The fluvial flood flows for the model nodes shown on the attached map are set out in the table below. They are measured in metres cubed per second (m³/s).

			Annual Exceedance Probability - Maximum Flows (m³/s)									
Node Label	Easting	Northing	50% (1 in 2)	20% (1 in 5)	10% (1 in 10)	5% (1 in 20)	4% (1 in 25)	2% (1 in 50)	1.33% (1 in 75)	1% (1 in 100)	1% (1 in 100) inc 20% Climate Change	0.5% (1 in 200)
ST410245	546513	361211	10.80	15.06	17.42	19.70	20.63	23.22	25.08	25.75	26.76	26.67
ST49745	546829	360824	10.68	14.93	17.26	19.41	20.35	23.14	24.98	25.71	26.78	26.67
ST49245	547129	360409	10.59	14.82	17.15	19.20	20.14	23.07	24.94	25.69	26.79	26.67
ST54600	547738	360390	6.50	8.55	9.73	10.63	11.03	11.95	12.50	12.78	12.92	13.36
ST54200	548134	360340	6.35	8.33	9.38	10.21	10.60	11.48	12.00	12.26	12.37	12.78
S6_4510	548915	362635	1.68	1.68	1.69	1.87	1.97	2.19	2.25	2.28	2.35	2.33
S6_3717	548934	361947	1.63	1.63	1.63	1.76	1.86	2.03	2.07	2.08	2.13	2.12
S6_3187	549222	361627	1.56	1.56	1.56	1.70	1.79	1.94	1.98	1.99	2.03	2.02

Baseline Modelled Flood Extents (with defences) Model: River Steeping 2009 [CCN-2023-305777]



Environment Agency

Scale 1:10,000

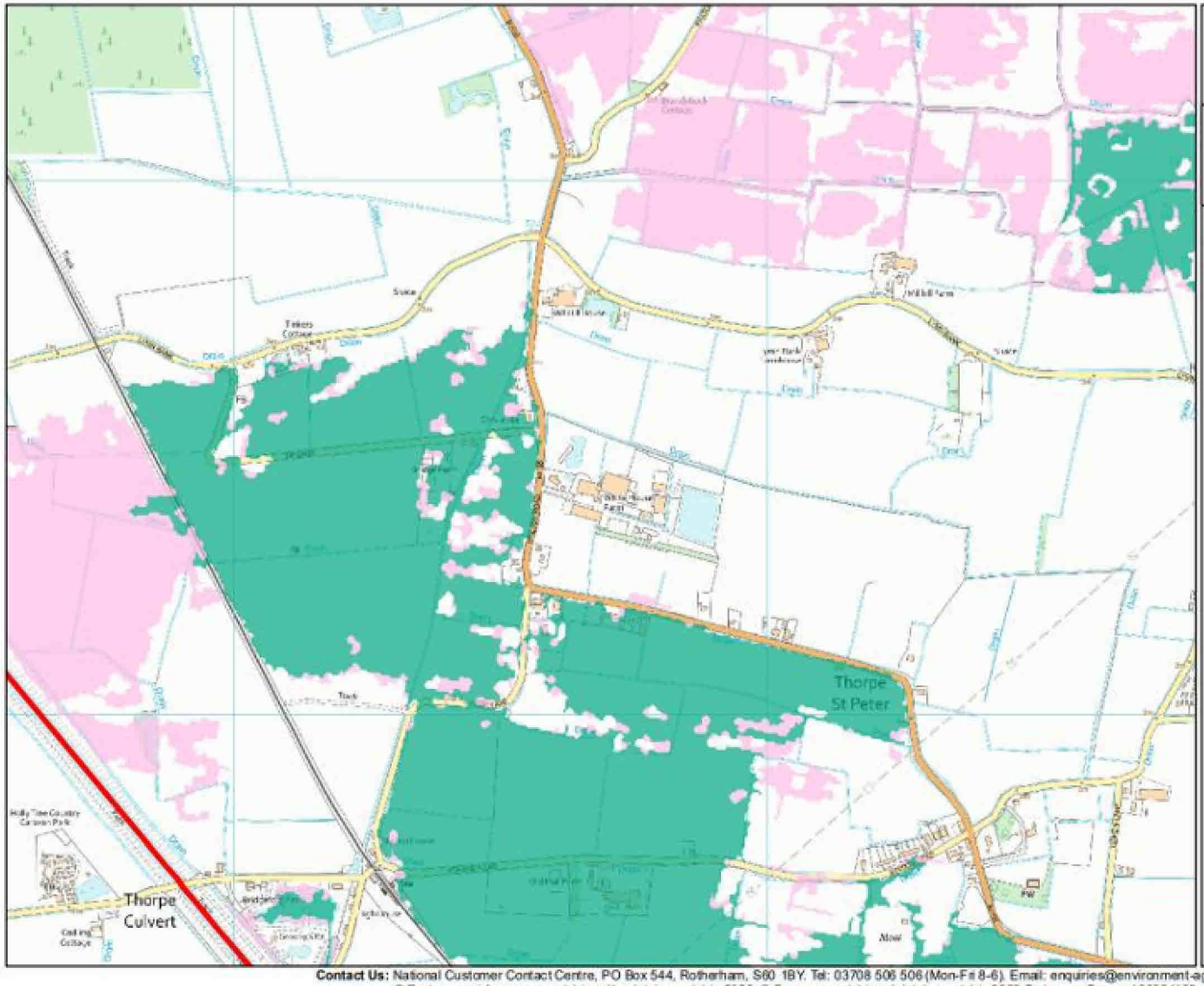
N
W E
S

Legend

- Main River
- 1% (1in 100) fluvial event
- 0.1% (1 in 1000) fluvial event

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

Climate Change Modelled Flood Extents (with defences) Model: River Steeping 2009 [CCN-2023-305777]



Environment Agency

Scale 1:10,000

N
W E
S

Legend

- Main River
- 1% (1 in 100) inc 20% climate change fluvial event
- 0.1% (1 in 1000) inc 20% climate change fluvial event

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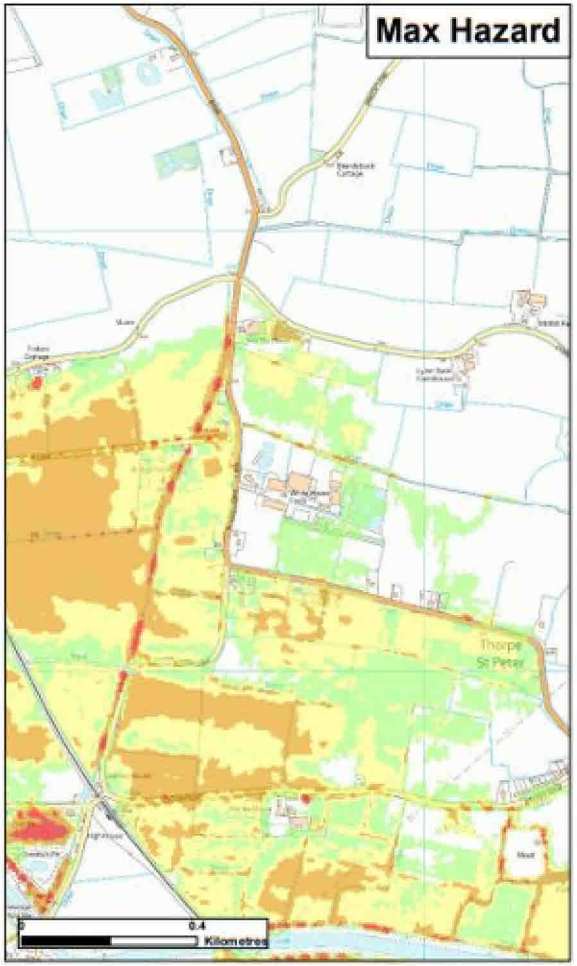

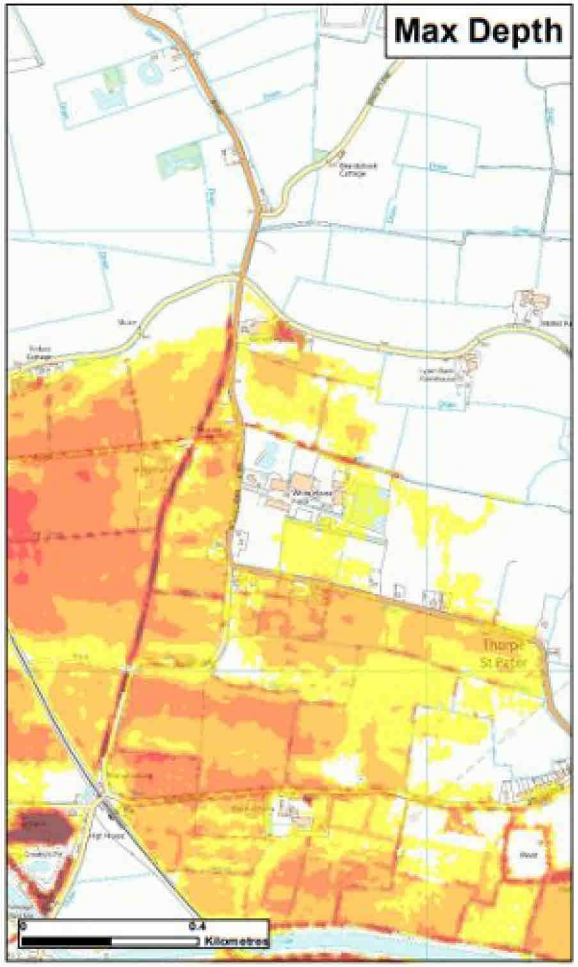

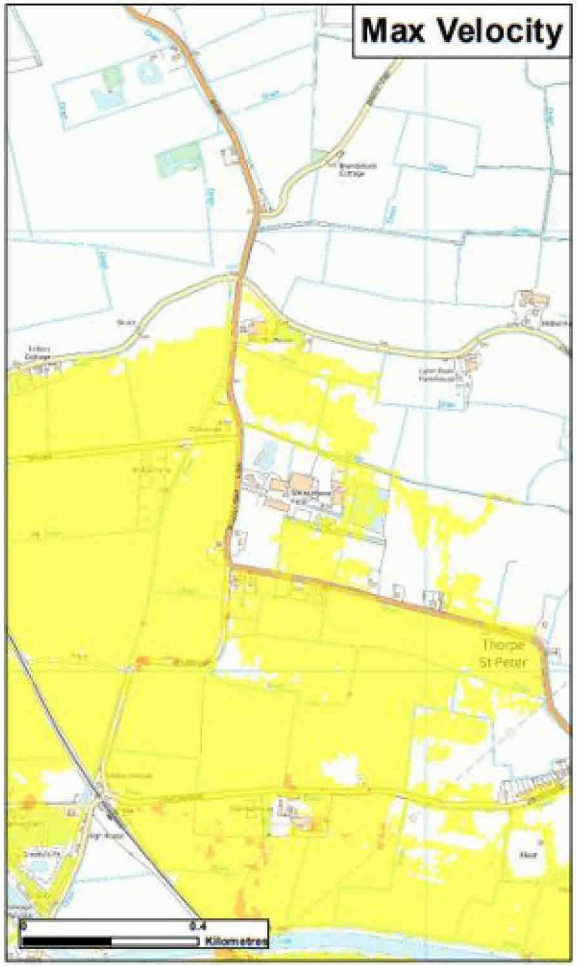

★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"

Max Hazard
(Flood Risk to People : FD2320)

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.0 (Danger for Most)
- Greater than 2.0 (Danger for All)

Max Depth (m)

- 0 - 0.25
- 0.25 - 0.50
- 0.50 - 1.0
- 1.0 - 1.6
- 1.6 +

Max Velocity (m/s)

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 +

Date Printed	April 2023	Scenario year	2011	Scenario Annual Chance	1% (1 in 100)	CCN Number	CCN-2023-305777

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.

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.

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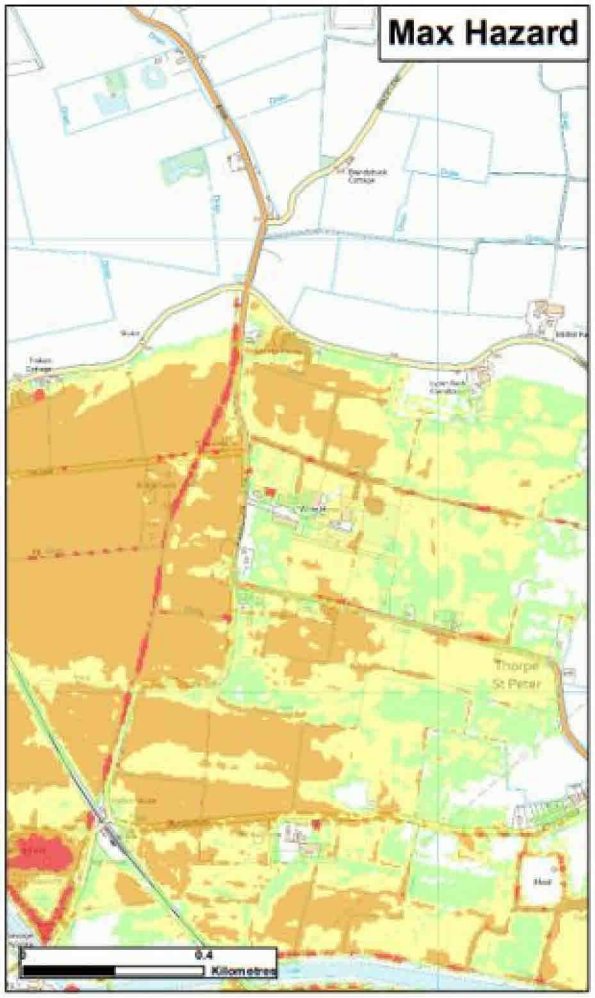
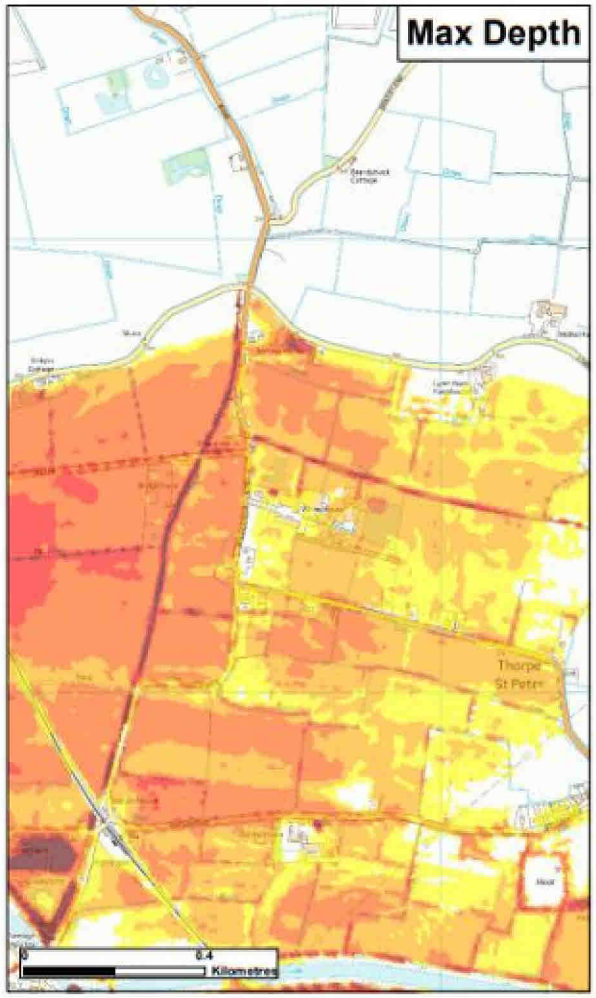
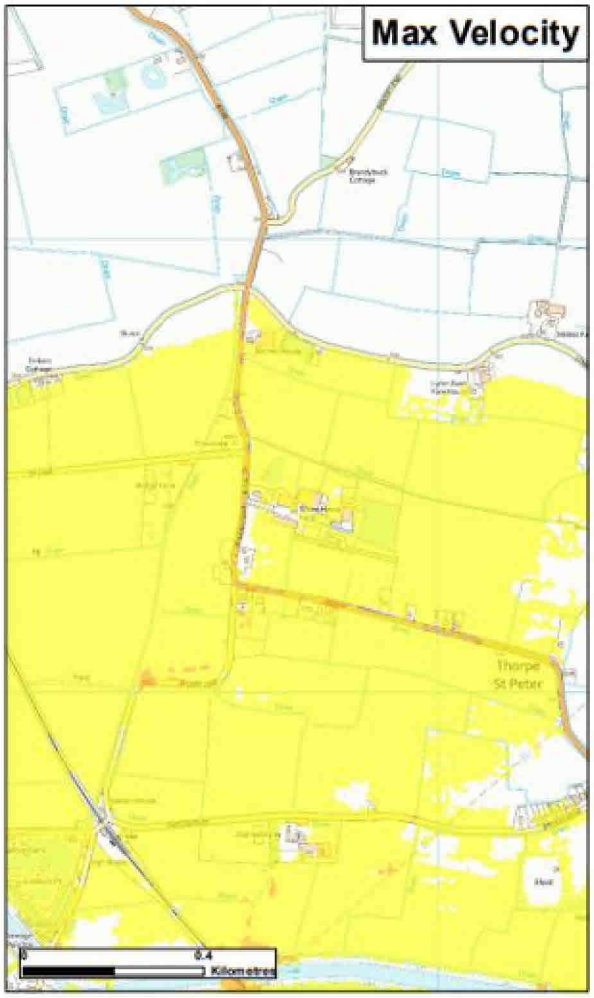
Environment Agency

Lincolnshire and Northamptonshire Fluvial Hazard Mapping

Map Centred on TF 47689 61428







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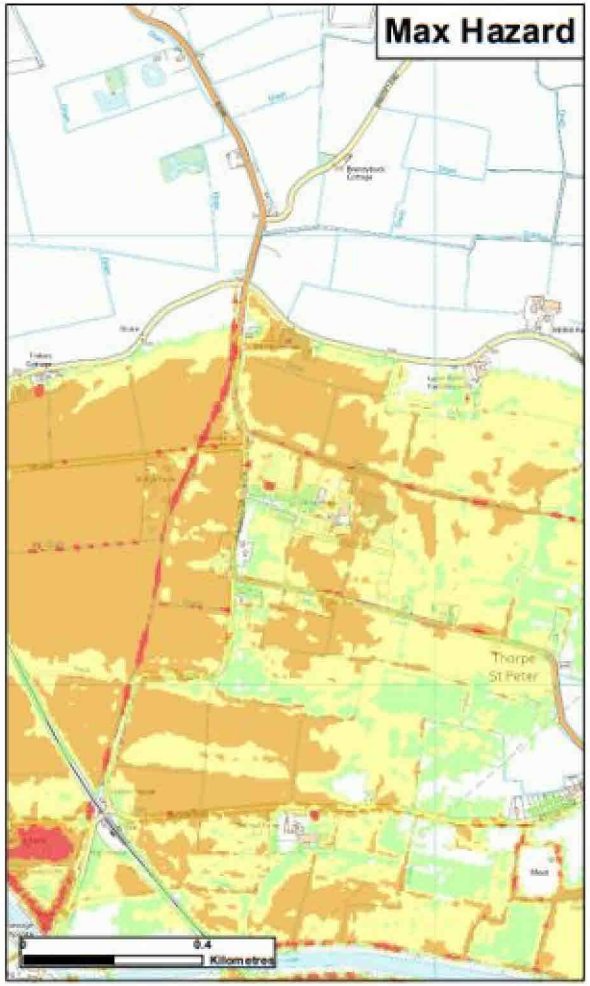

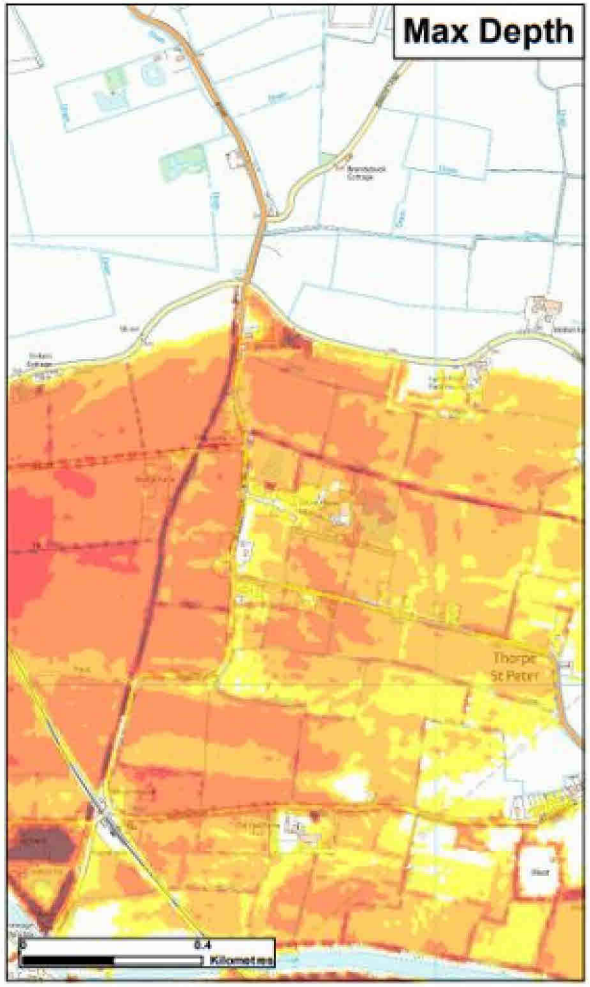

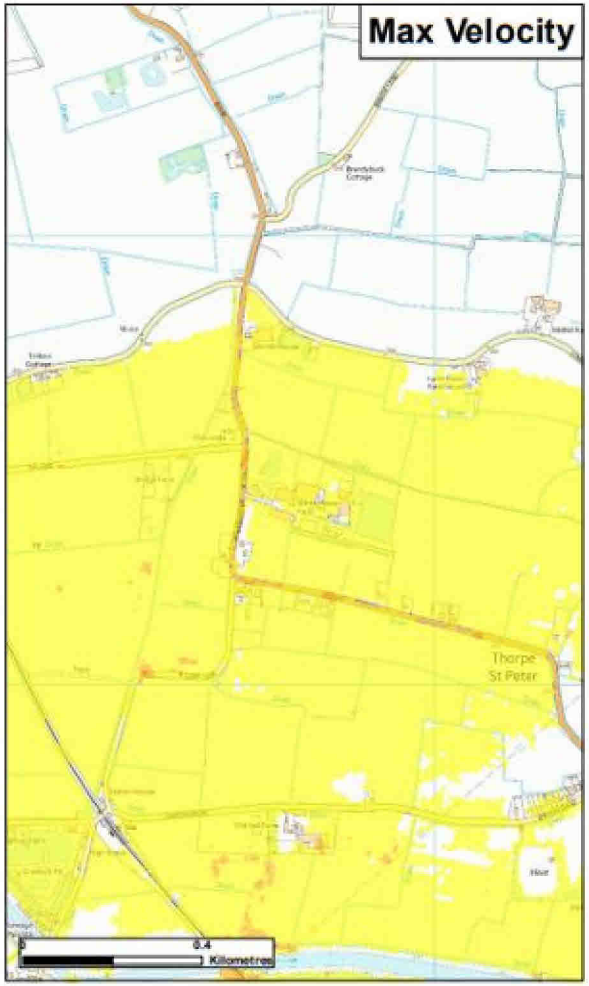

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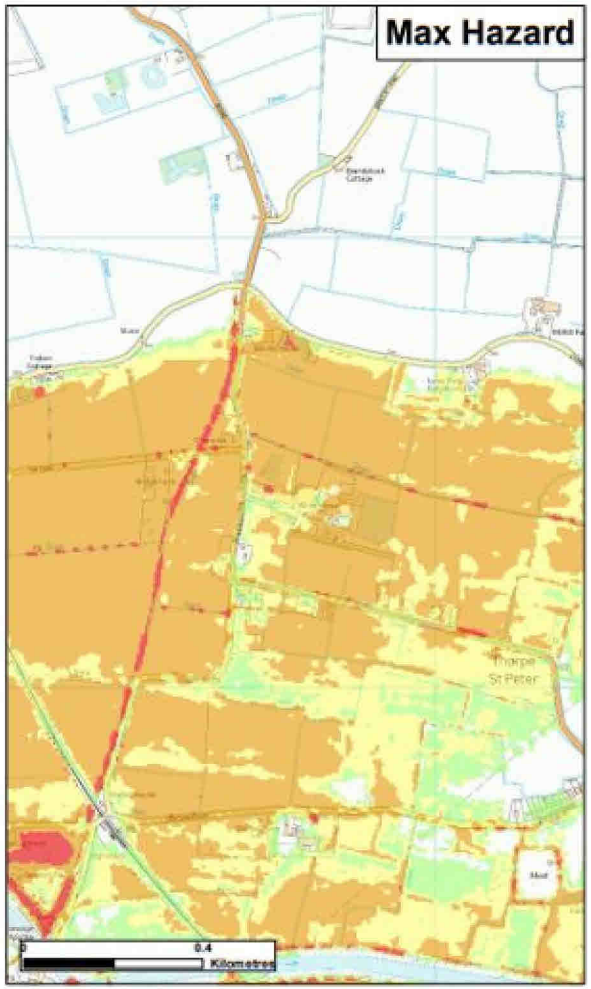
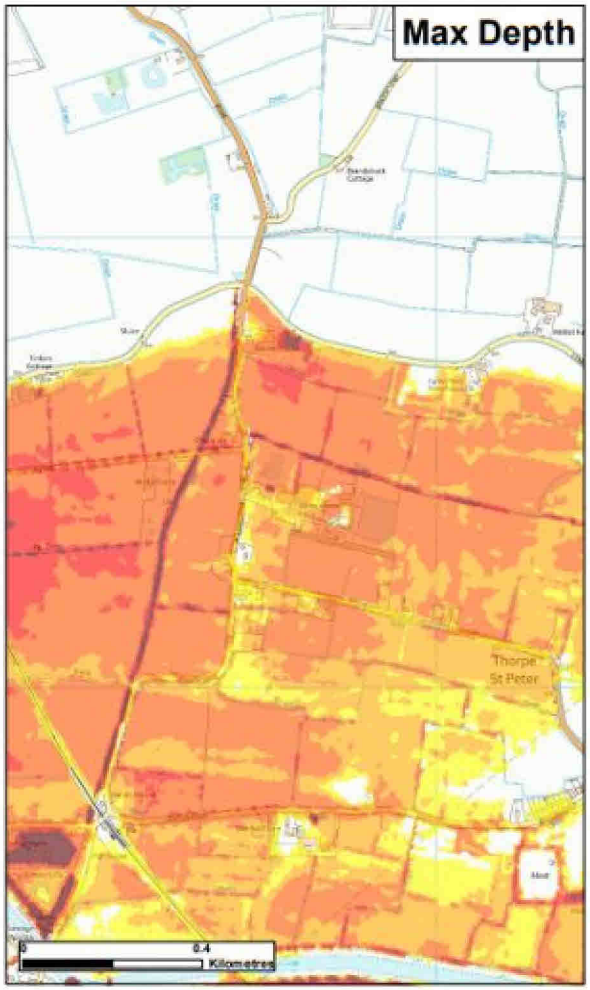
General Enquiries No: 03708 506 506. Weekday Daytime calls cost 6p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary.

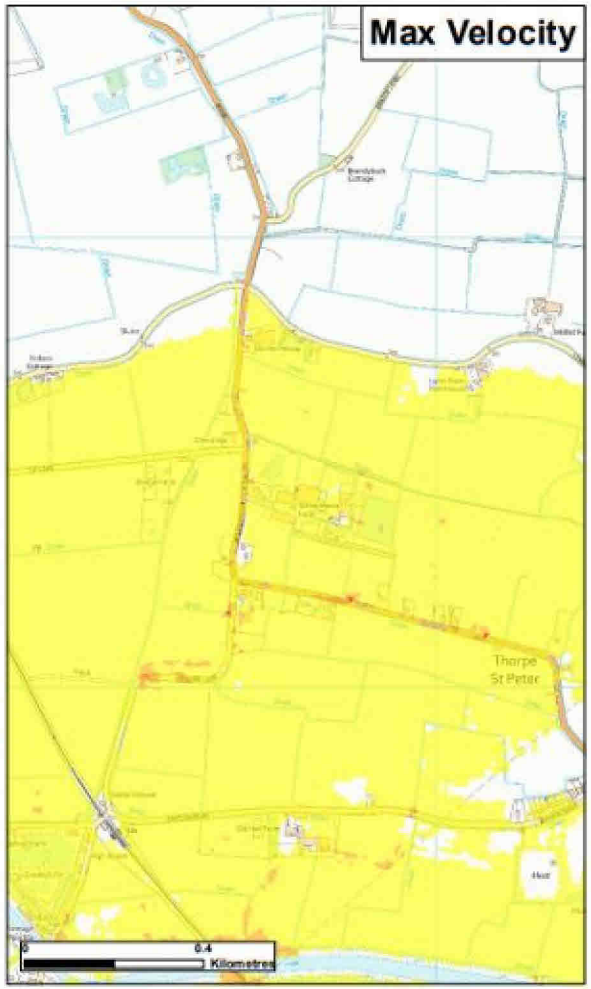
Environment Agency

Lincolnshire and Northamptonshire Fluvial Hazard Mapping

Map Centred on TF 47689 61428







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Date Printed	April 2023	**Scenario year**	2115	**Scenario Annual Chance**	0.1% (1 in 1000)	**CCN Number**	CCN-2023-305777

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Environment Agency

Lincolnshire and Northamptonshire Fluvial Hazard Mapping

Map Centred on TF 47689 61428

East Coast and Wash - 2018 Coastal Flood Boundary [CFB] Dataset
Key Node Points

Environment Agency

Scale 1:550,000

▲ East Coast and Wash

See separate data sheet for predicted flood levels

Created by the Partnerships and Strategic Overview Team, Lincoln

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

East Coast and Wash: Immingham to the West Lighthouse

2018 Coastal Flood Boundary Extreme Sea Levels

Environment Agency

CFB Ref	Location	Easting	Northing	Annual Chance (1 in x) of Tide Level in metres ODN																				
				1			10			50			100			200			300			1000		
				Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound		
				2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%
3888	Immingham	520440	417625	4.16	4.17	4.19	4.50	4.53	4.62	4.73	4.80	5.00	4.83	4.93	5.19	4.93	5.06	5.41	4.98	5.14	5.55	5.15	5.38	6.01
3890	Haborough Marsh	522100	416512	4.14	4.15	4.17	4.48	4.51	4.60	4.70	4.77	4.97	4.80	4.90	5.16	4.90	5.03	5.38	4.94	5.10	5.51	5.11	5.34	5.97
3898	Grimsby	529295	413162	3.98	3.99	4.01	4.31	4.34	4.43	4.53	4.60	4.80	4.61	4.71	4.97	4.71	4.84	5.19	4.74	4.90	5.31	4.88	5.11	5.74
3906	Buck Beck	534709	407369	3.87	3.88	3.90	4.19	4.23	4.31	4.41	4.50	4.68	4.50	4.61	4.86	4.61	4.75	5.10	4.64	4.82	5.22	4.80	5.05	5.66
3910	Tetney	538035	405537	3.85	3.86	3.89	4.17	4.22	4.30	4.40	4.50	4.67	4.49	4.61	4.86	4.60	4.75	5.10	4.63	4.82	5.21	4.80	5.06	5.66
3918	Donna Nook	544641	401997	3.82	3.83	3.86	4.14	4.19	4.27	4.38	4.48	4.65	4.47	4.60	4.85	4.58	4.74	5.10	4.63	4.82	5.22	4.81	5.08	5.68
3928	Saltfleet	549131	393360	3.78	3.79	3.82	4.11	4.16	4.26	4.36	4.46	4.64	4.47	4.59	4.86	4.57	4.74	5.11	4.63	4.83	5.25	4.83	5.11	5.74
3942	Boygrift	555131	380860	3.72	3.74	3.77	4.06	4.11	4.22	4.33	4.43	4.65	4.43	4.57	4.87	4.56	4.73	5.13	4.62	4.83	5.28	4.85	5.15	5.82
3968	Gibraltar Point	557652	356181	4.16	4.17	4.20	4.51	4.56	4.67	4.76	4.85	5.08	4.85	4.97	5.27	4.94	5.10	5.49	4.99	5.18	5.63	5.14	5.41	6.09
3992_14	Hobhole	535990	340116	4.96	4.97	5.01	5.40	5.44	5.56	5.66	5.76	5.98	5.78	5.90	6.20	5.88	6.04	6.44	5.92	6.11	6.57	6.03	6.31	6.99
	Grand Sluice*	532366	344510	4.93	4.94	4.98	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
3992_9	Boston Barrier	532754	342852	4.93	4.94	4.98	5.41	5.45	5.57	5.73	5.83	6.05	5.85	5.97	6.27	5.93	6.09	6.49	5.94	6.13	6.59	5.98	6.26	6.94
3992_5	Fosdyke Bridge	531886	332234	4.87	4.88	4.92	5.31	5.35	5.47	5.58	5.68	5.90	5.71	5.83	6.13	5.82	5.98	6.38	5.87	6.06	6.52	6.01	6.29	6.97
4008	West Lighthouse	550094	329971	4.87	4.88	4.91	5.21	5.26	5.37	5.46	5.56	5.78	5.56	5.68	5.98	5.66	5.82	6.21	5.71	5.90	6.35	5.86	6.14	6.81
-	Marsh Road	525988	324065	-	5.04	-	-	5.44	-	-	5.73	-	-	5.85	-	-	5.98	-	-	-	-	-	-	-
-	Wisbech	546110	309940	-	4.83	-	-	5.25	-	-	5.53	-	-	5.66	-	-	5.78	-	-	-	-	-	-	-
-	Dog-in-a-Doublet	527200	299287	-	3.67	-	-	4.00	-	-	4.22	-	-	4.32	-	-	4.42	-	-	-	-	-	-	-

See next page for notes

East Coast and Wash: Immingham to the West Lighthouse

2018 Coastal Flood Boundary Extreme Sea Levels

NOTES:

The following notes apply to all CFB sites (ie all on table excluding Marsh Road, Wisbech, Dog-in-a-Doublet)

- The base date for the data is 2017.
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- For additional information relating to the 2018 Coastal Flood Boundary Extreme Sea Levels or to access the full dataset for the above sites or intermediate locations refer to the Defra Metadata Catalogue at https://deframetadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590

The following notes apply to all Marsh Road, Wisbech, Dog-in-a-Doublet

- The base date for the data is 2006
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- Levels for other annual chance probabilities are available if required.
- These levels will be updated as their respective tidal river models are updated.

The following notes apply to Grand Sluice

- The data is based on CFB 2018 data for Boston Barrier site, capped at 5.3mAOD to reflect use of the barrier.
- The base date for the data is 2017
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
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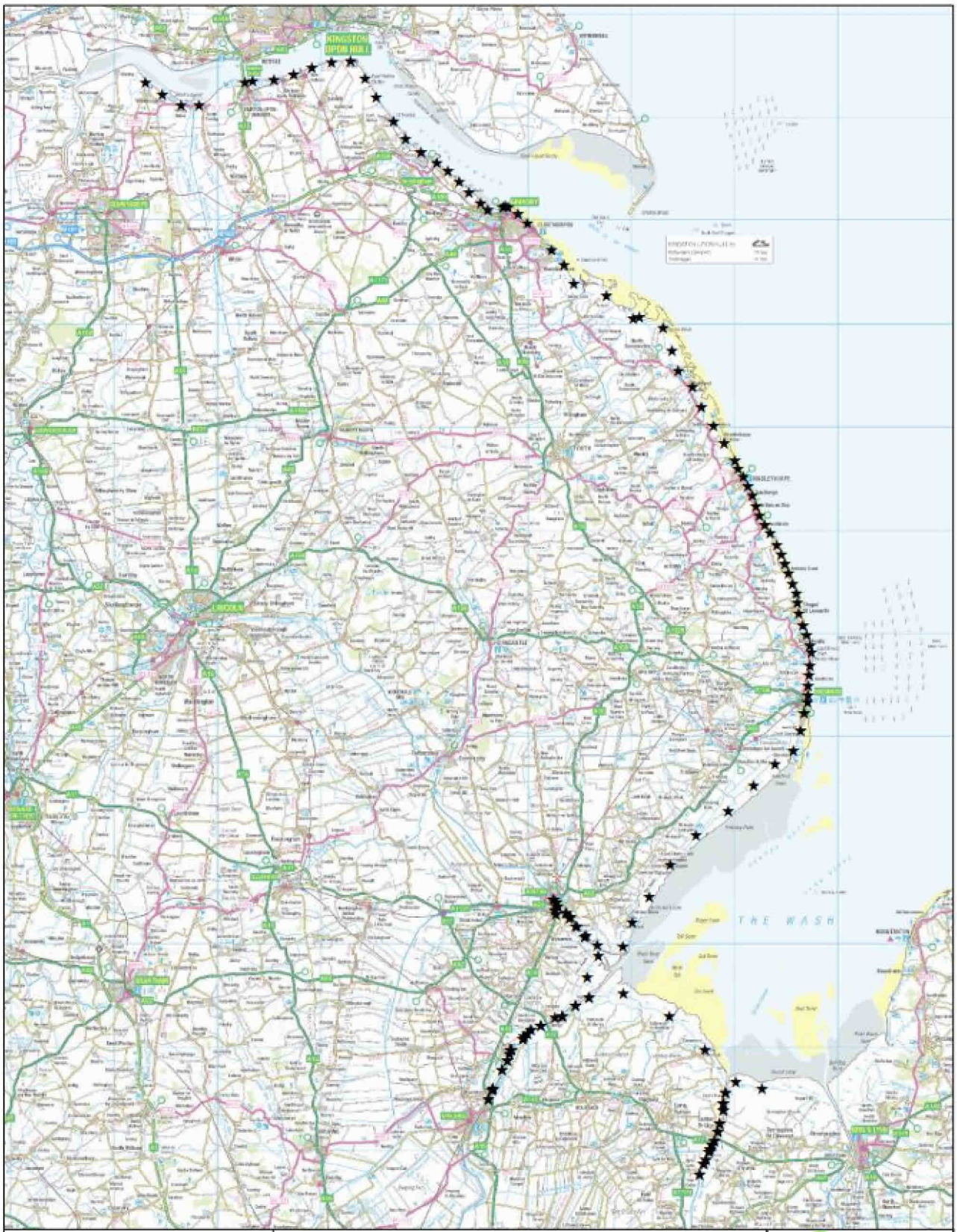


★ Modelled Breach Locations

0 3.5 7 14
Kilometers

This map idicates the location of where we have modelled the consequence of breaches in the defences along the coastline and tidal rivers. We have mapped the maximum values of Hazard Rating (Danger to People), Depth and Velocity.

We have not assumed that all breaches occur at the same time, but have modelled each breach individually and overlaid the results to find the maximum values.

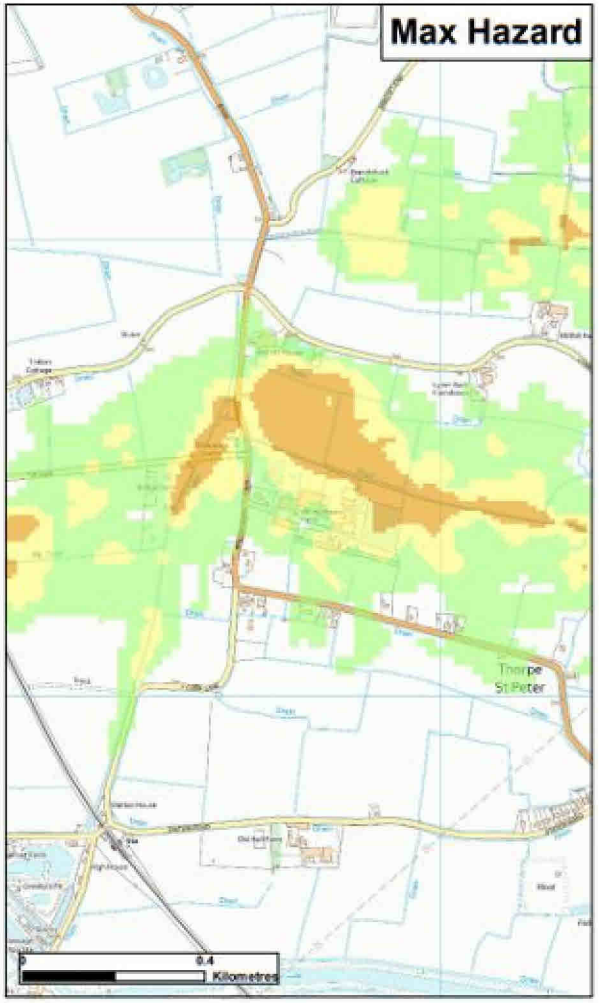
Our modelling only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. Our defences generally provide a good standard of flood defence but a risk of breaching remains.

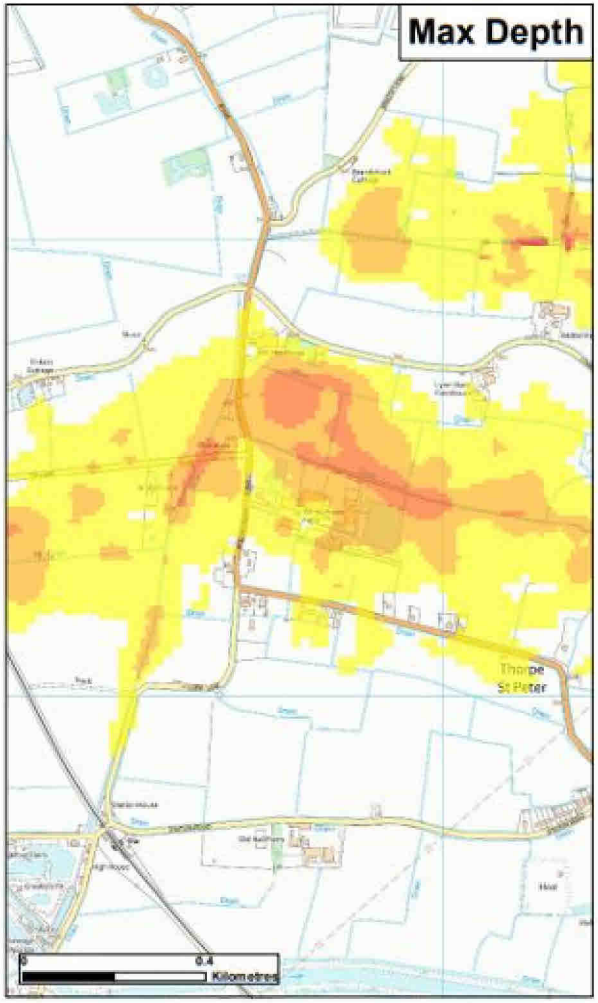
Please contact the Environment Agency for information on how these maps are used in the management of flood risk.

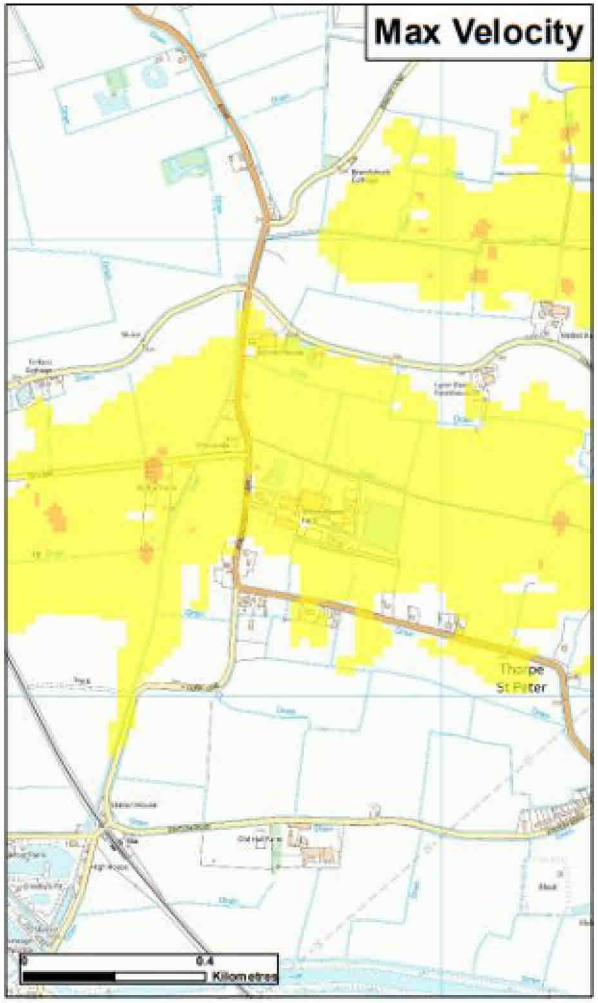
Environment Agency

Northern Area Tidal Hazard Mapping

Location of Modelled Breaches







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- 1.6 +

Max Velocity (m/s)

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- 1.0 - 1.5
- 1.5 - 2.5
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Date Printed	April 2023	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2023-305777

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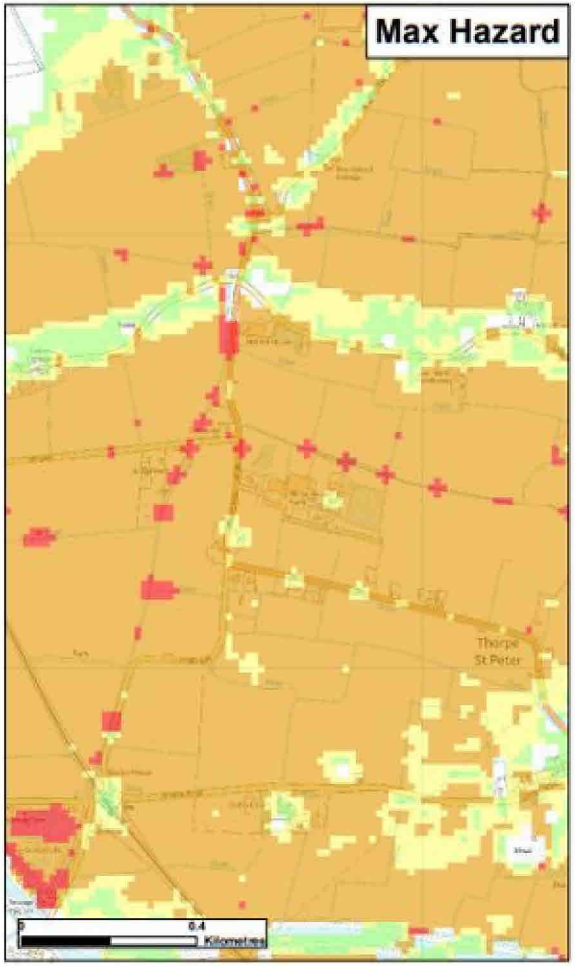
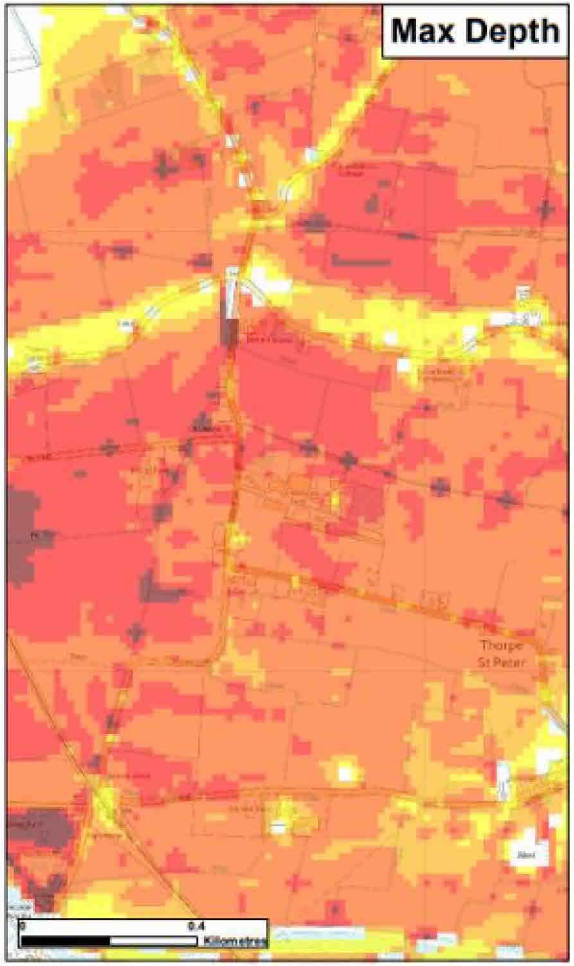
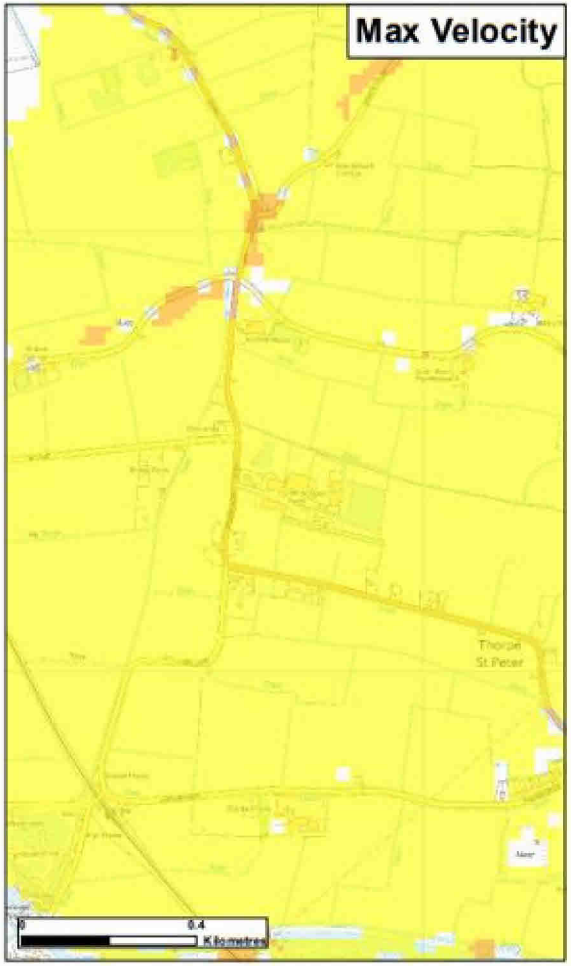
Lincolnshire and Northamptonshire Tidal Breach Hazard Mapping

Map Centred on TF 47689 61428







Max Hazard
(Flood Risk to People : FD2320)

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.0 (Danger for Most)
- Greater than 2.0 (Danger for All)

Max Depth (m)

- 0 - 0.25
- 0.25 - 0.50
- 0.50 - 1.0
- 1.0 - 1.6
- 1.6 +

Max Velocity (m/s)

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 +

Date Printed	April 2023	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2023-305777

The map is based on computer modelling of simulated overtopping of the main coastal defences for specific tidal scenarios. It does not include overtopping along the following tidal rivers which are currently being investigated: Witham Haven (upstream of Hobhole), and Welland (upstream of Fosdyke Bridge)

The map only considers the consequences of overtopping of the defences, and does not show the possible consequences of breaches of the tidal defences. Separate maps of the flood extent from just breaching of the defences are available.

For future climate change scenarios it is assumed that defences remain at 2006 heights.

These maps do not replace the flood zone maps used in the National Planning Policy Framework (NPPF)

Environment Agency

Lincolnshire and Northamptonshire Tidal Overtopping Hazard Mapping

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