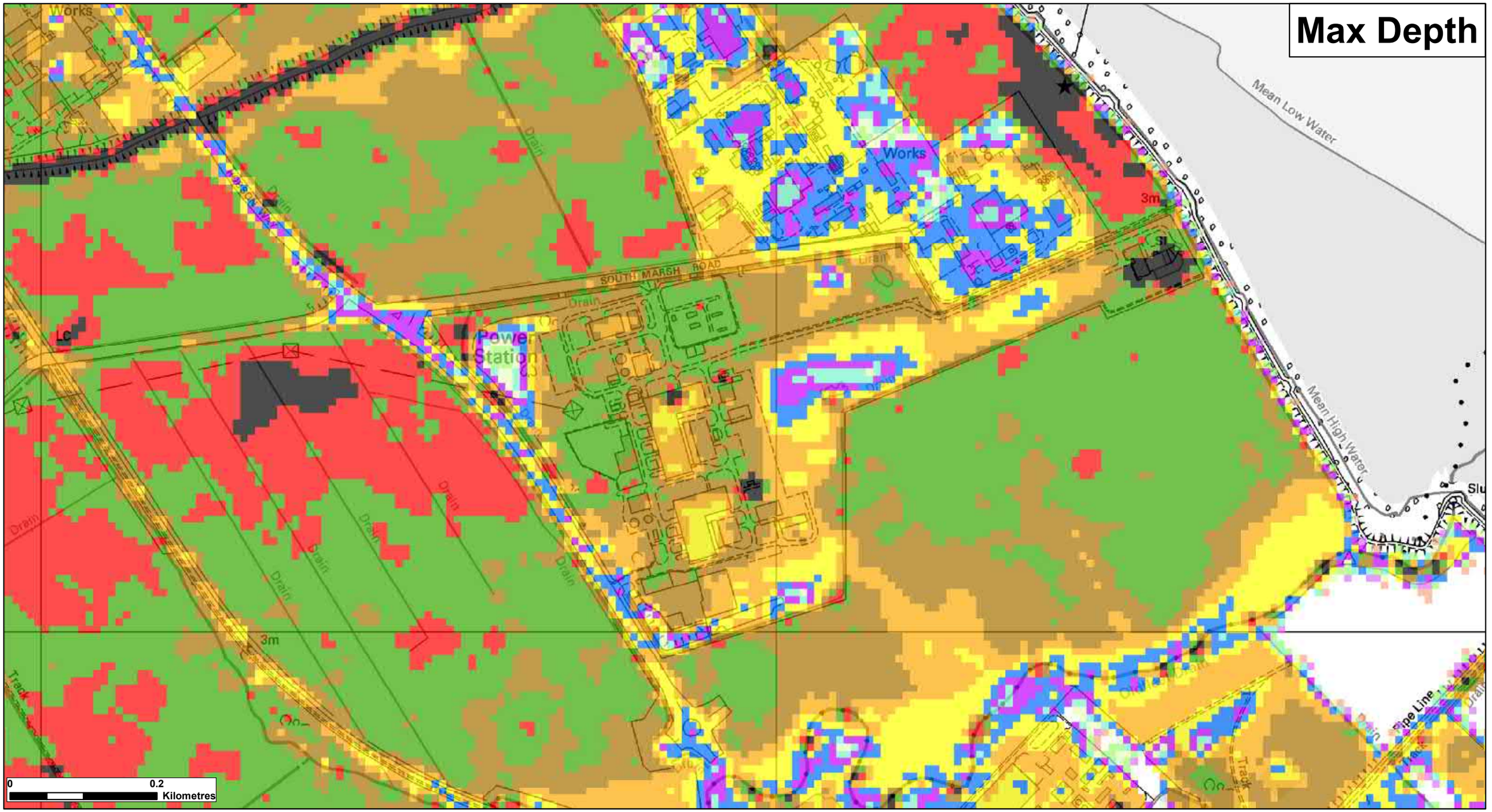
ANNEX 1: ENVIRONMENT AGENCY CONSULTATION

Max Depth



Modelled depths (m):

★ Tidal Modelled Breach Locations

0 - 0.25	0.75 - 1	1.25 - 1.5	2 - 2.25
0.25 - 0.5	1 - 1.25	1.5 - 1.75	2.25 - 2.5
0.5 - 0.75	1.75 - 2	2.75 - 3	2.5 - 2.75
		3 +	

Date Printed	September 2018	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)

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.

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.

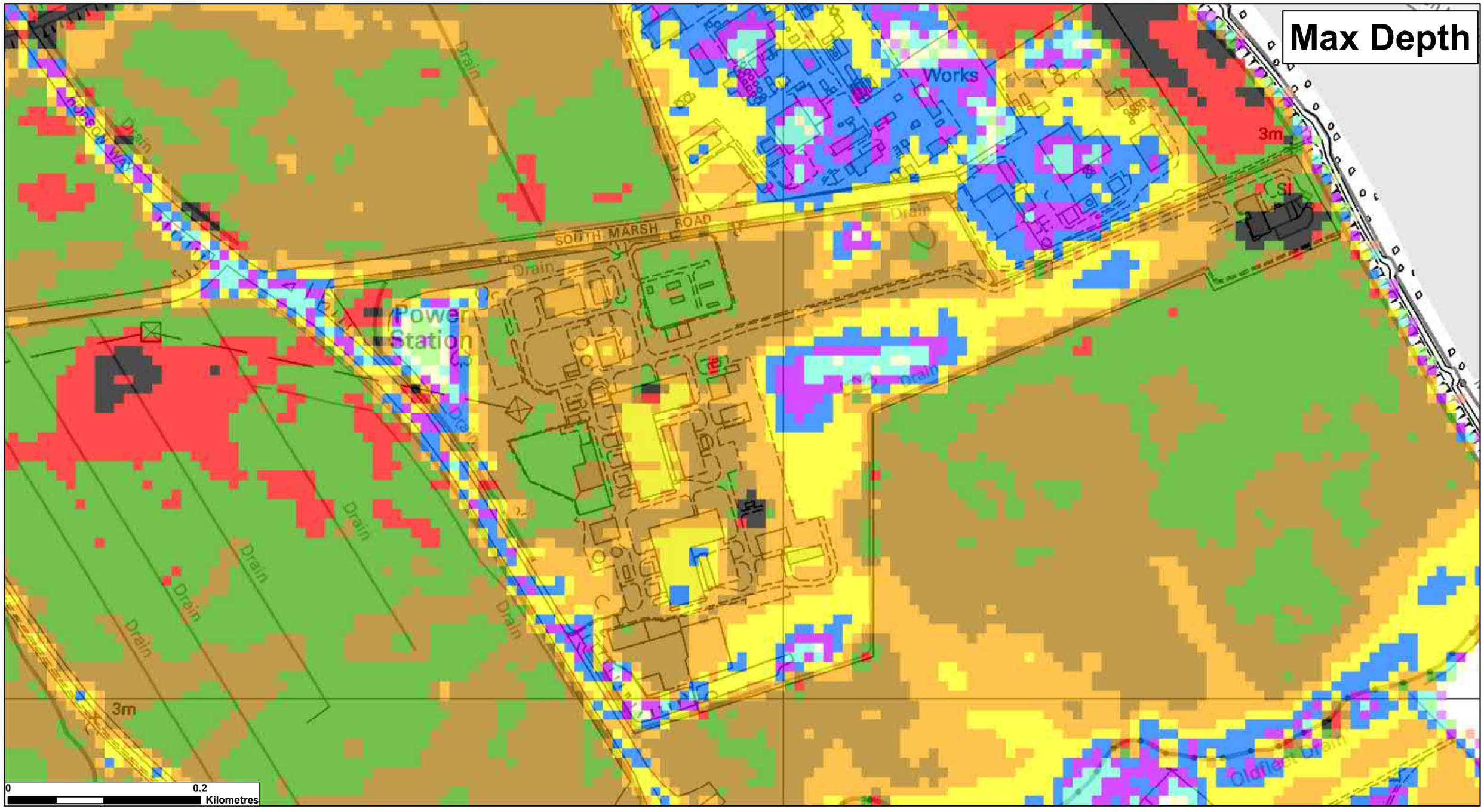
General Enquiries No: 03708 506 506. Calls to 03 numbers cost the same as calls to standard geographic numbers (i.e. numbers beginning with 01 or 02.

Environment Agency

Produced by the Partnerships & Strategic Overview Team, Lincoln

Northern Area Tidal Breaching Hazard Mapping

Map Centered on TA 22956 13305



Modelled depths (m):

- ★ Tidal Modelled Breach Locations
- 0 - 0.25
- 0.25 - 0.5
- 0.5 - 0.75
- 0.75 - 1
- 1 - 1.25
- 1.25 - 1.5
- 1.5 - 1.75
- 1.75 - 2
- 2 - 2.25
- 2.25 - 2.5
- 2.5 - 2.75
- 2.75 - 3
- 3 +

Date Printed	september 2018	Scenario year	2115	Scenario Annual Chance	0.5% (1 in 200)

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.

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.

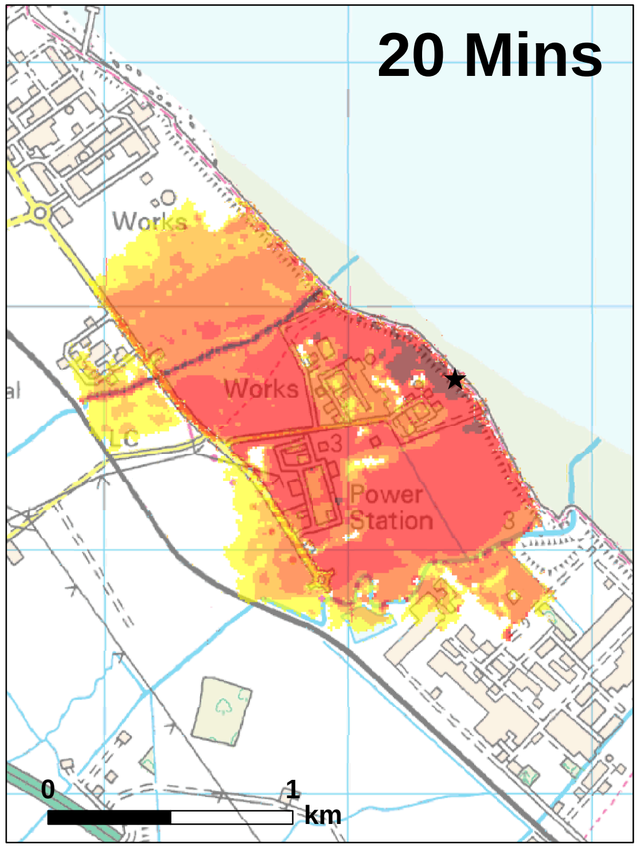
General Enquiries No: 03708 506 506. Calls to 03 numbers cost the same as calls to standard geographic numbers (i.e. numbers beginning with 01 or 02.

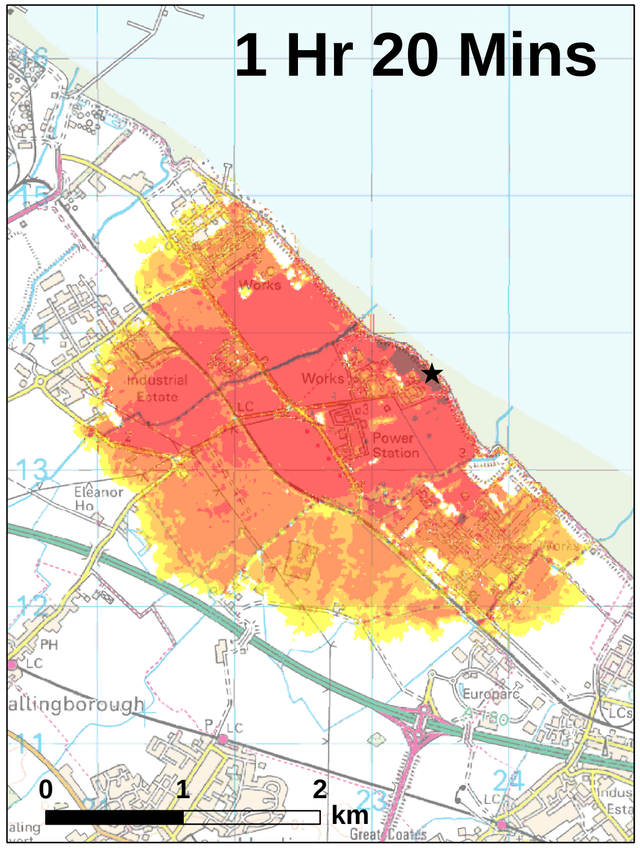
Environment Agency

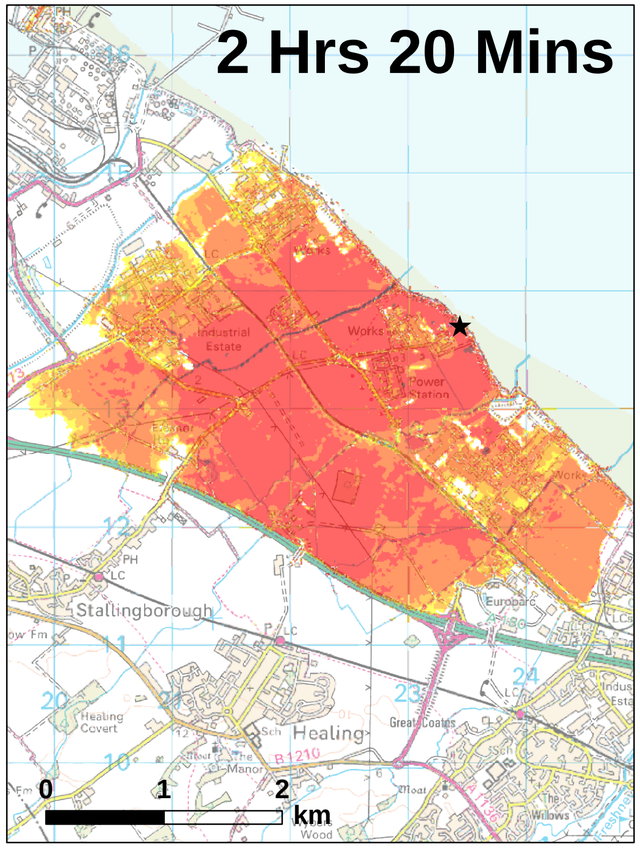
Produced by the Partnerships & Strategic Overview Team, Lincoln

Northern Area Tidal Breaching Hazard Mapping

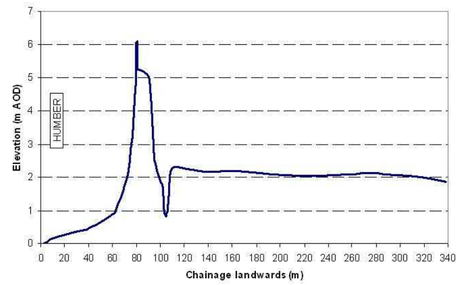
Map Centered on TF 22956 13305

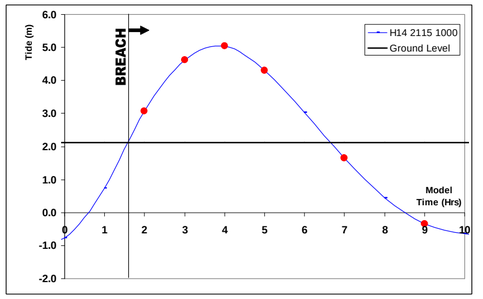


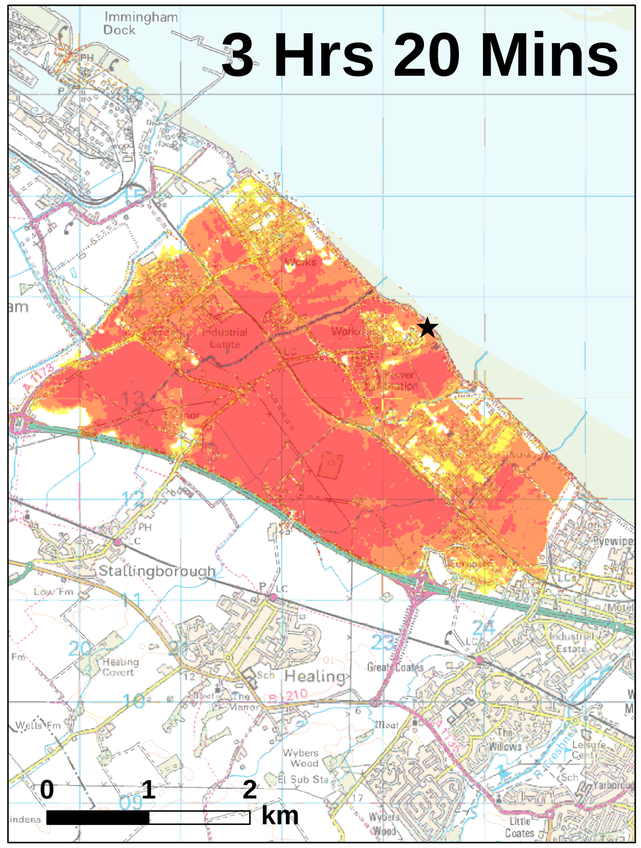


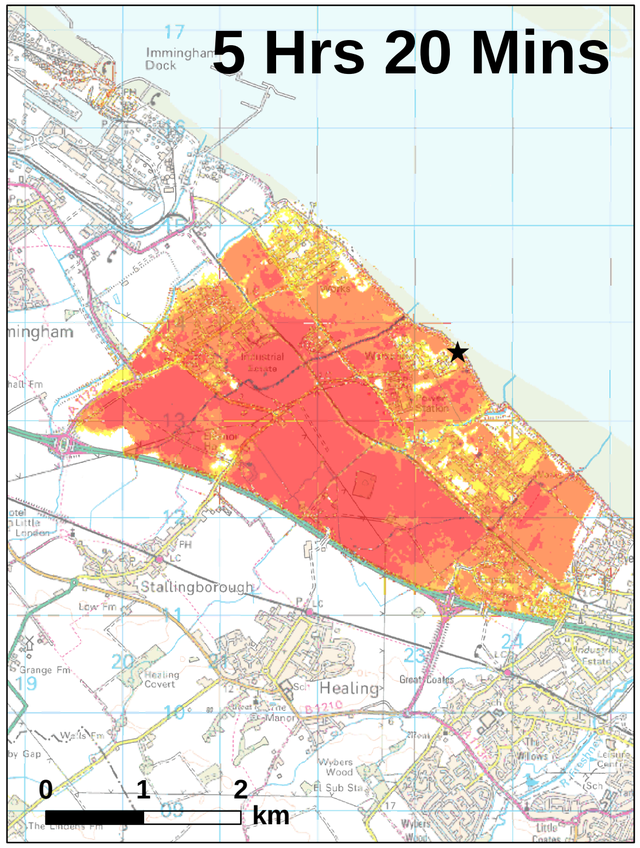


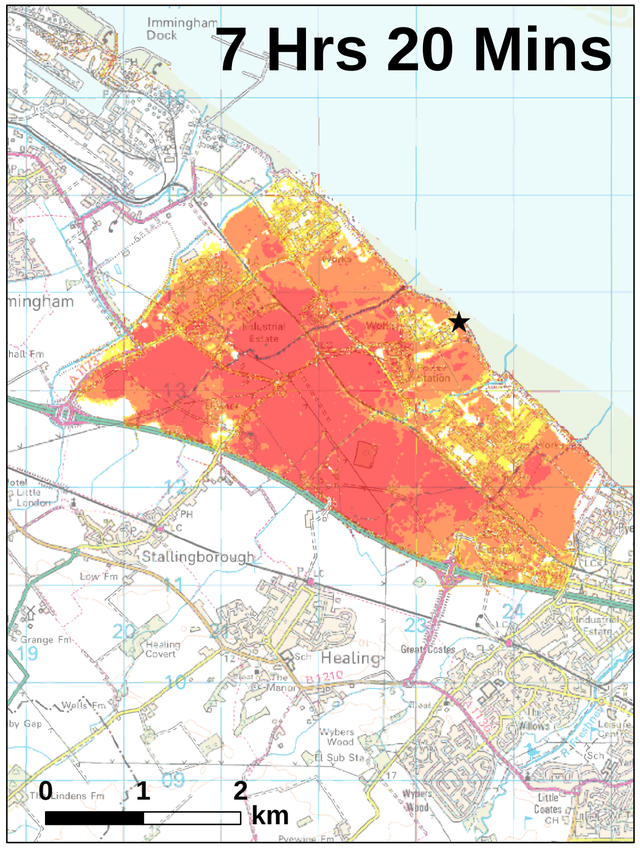
Legend		
Depth (m)	Breach	H14
0 - 0.25	Type	Earthbank
0.25 - 0.5	Near	South of Immingham
0.5 - 1	Width	50m
1 - 2	Storm	1000 years
>2	Year	2115











ALL MAP TIMES ARE DISPLAYED AS TIME AFTER A BREACH OCCURING

Mott MacDonald for Environment Agency

Hazard Mapping Northern Area AN785: DEPTH

ISSUE	PREPARED BY	CHECKED BY	APPROVED BY
1	KS	MP	SYE

DATE	PURPOSE OF MAP
SEPT 2009	Northern Tidal Flood Mapping

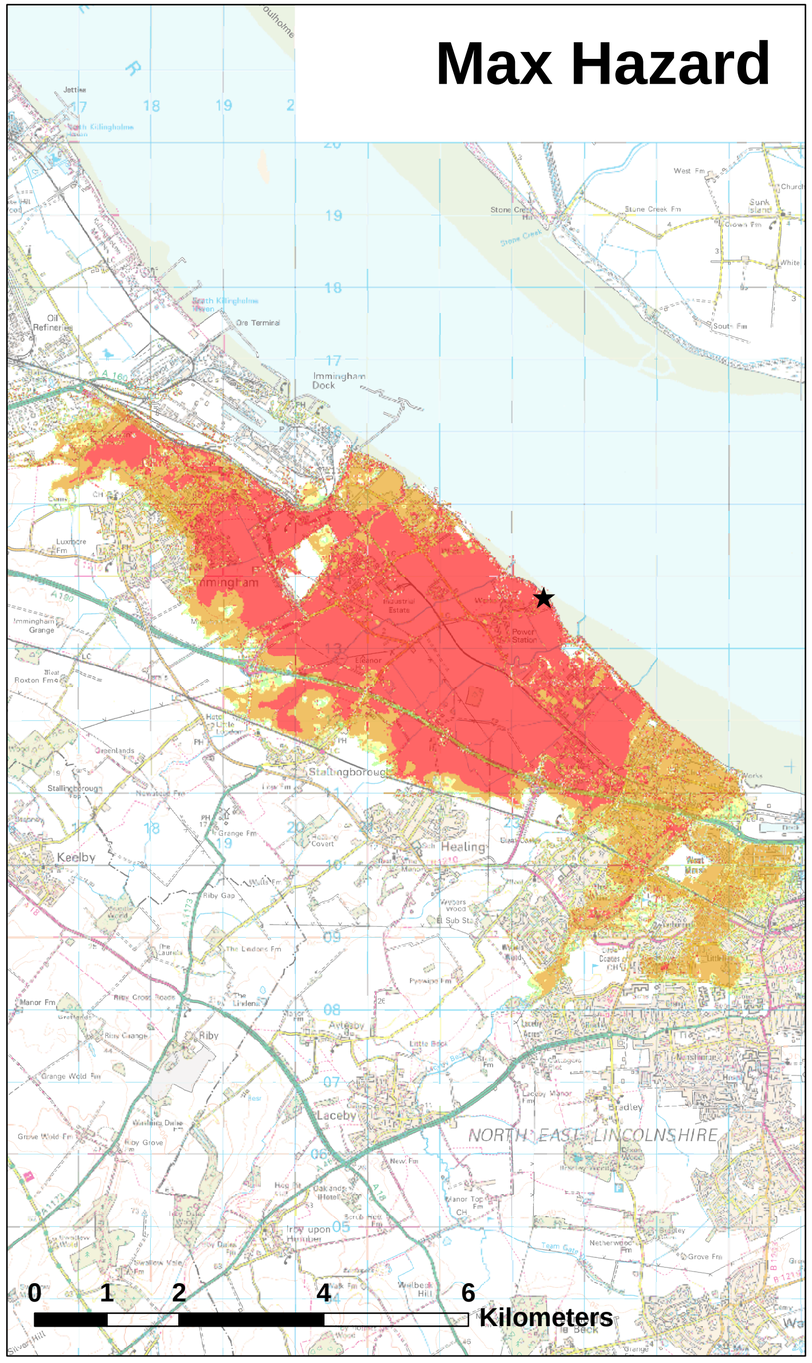
DIGITAL FILE PATH

P:\Cambridge\Demeter - Daedalus\WEM\PROJECTS\241496_Hazard Mapping\Report\Maps

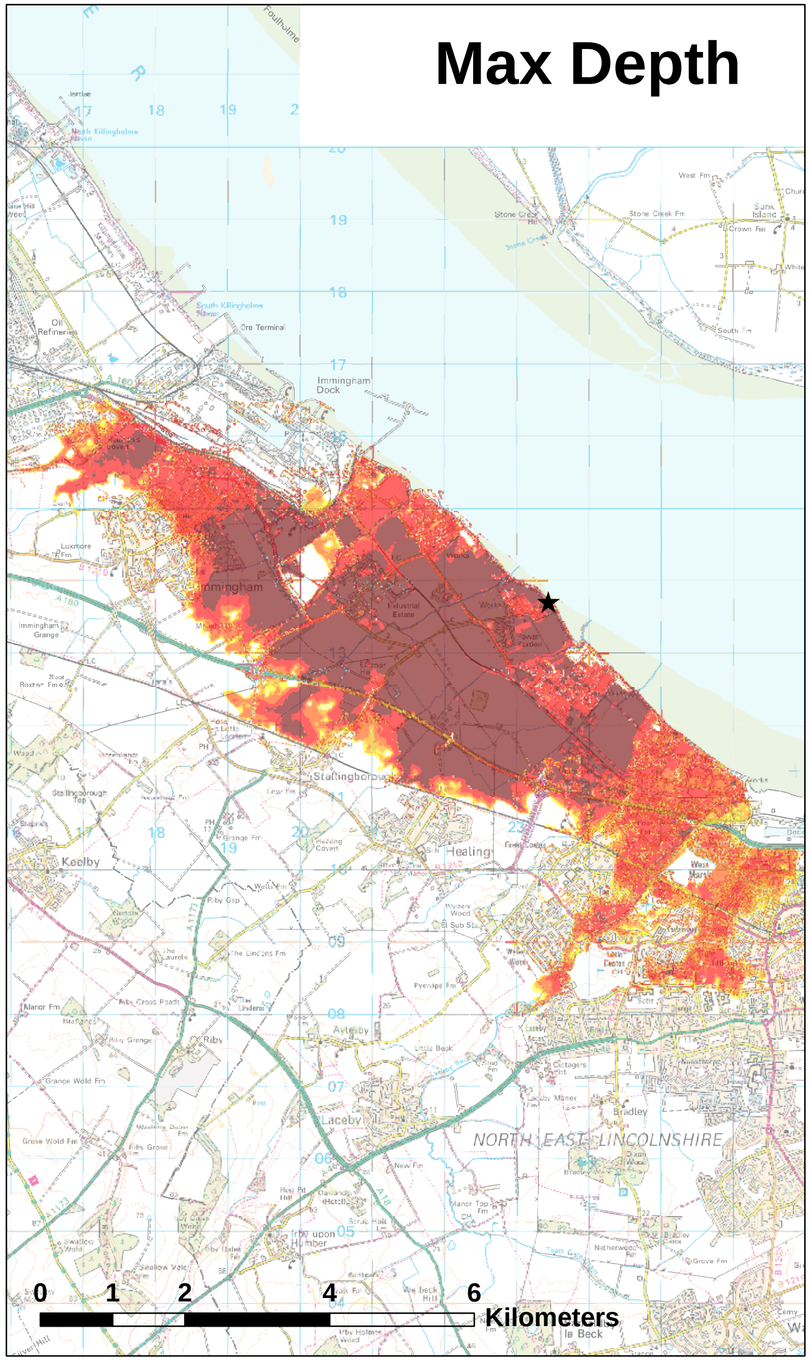
MAP REFERENCE (PROJECT NR./FIGURE NR./REVISION)

257248/H14.2115.1000/1

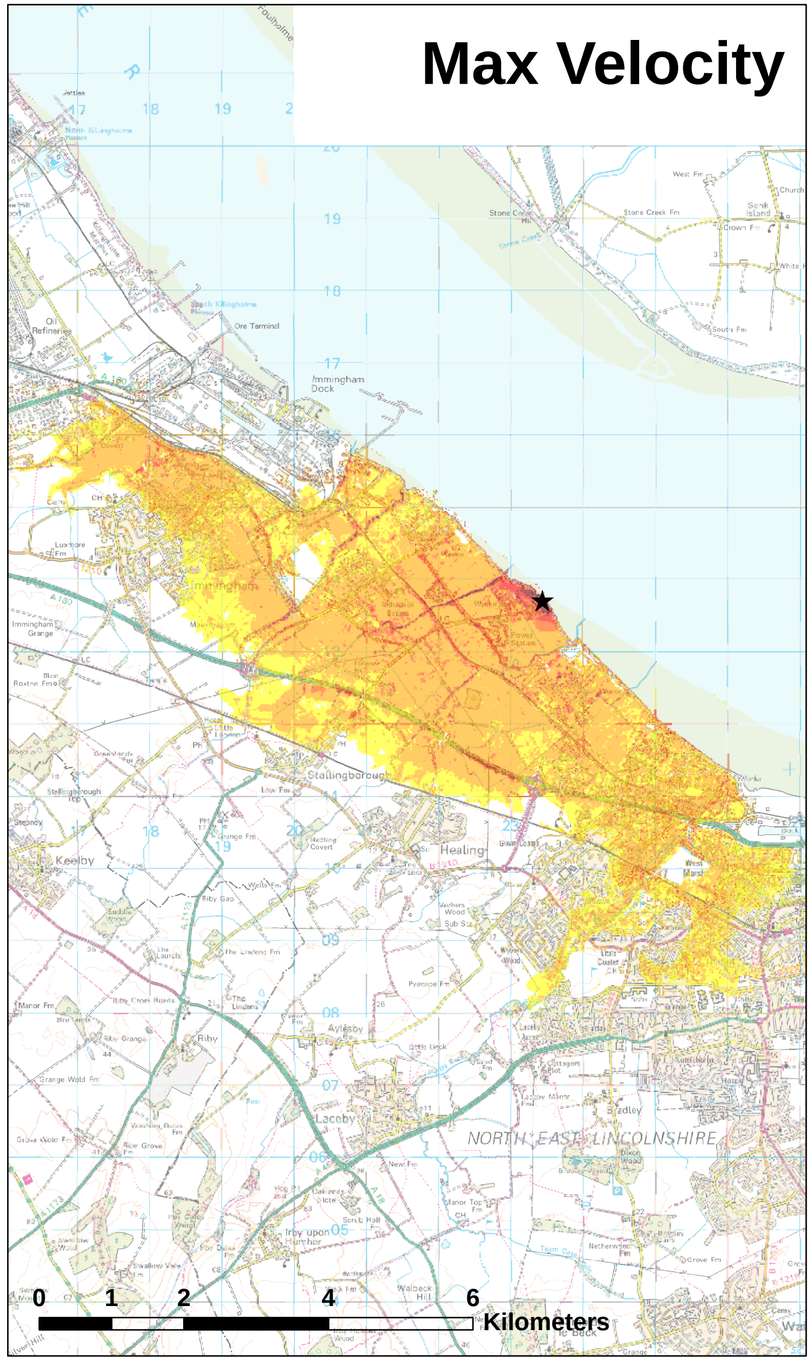
Max Hazard



Max Depth



Max Velocity



Hazard Rating

- 0 - 0.75
- 0.75 - 1.25
- 1.25 - 2
- >2

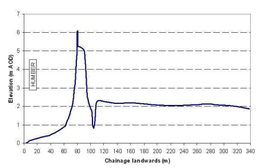
Depth (m)

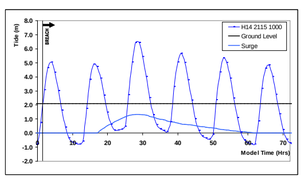
- 0 - 0.25
- 0.25 - 0.5
- 0.5 - 1
- 1 - 2
- >2

Velocity (m/s)

- 0 - 0.3
- 0.3 - 1
- 1 - 1.5
- 1.5 - 2.5
- >2.5

Breach	**H14**	**Near**	**South of Immingham**	**Storm**	**1000 years**
Type	**Earth Bank**	**Width**	**50m**	**Year**	**2115**





Hazard Mapping Northern Area AN785: Maximums

ISSUE	PREPARED BY	CHECKED BY	APPROVED BY
1	KS	MP	SYE

DATE	PURPOSE OF MAP
SEPT 2009	Northern Tidal Flood Mapping

DIGITAL FILE PATH

P:\Cambridge\Demeter - Daedalus\WEM\PROJECTS\241496_Hazard Mapping\Report\Maps

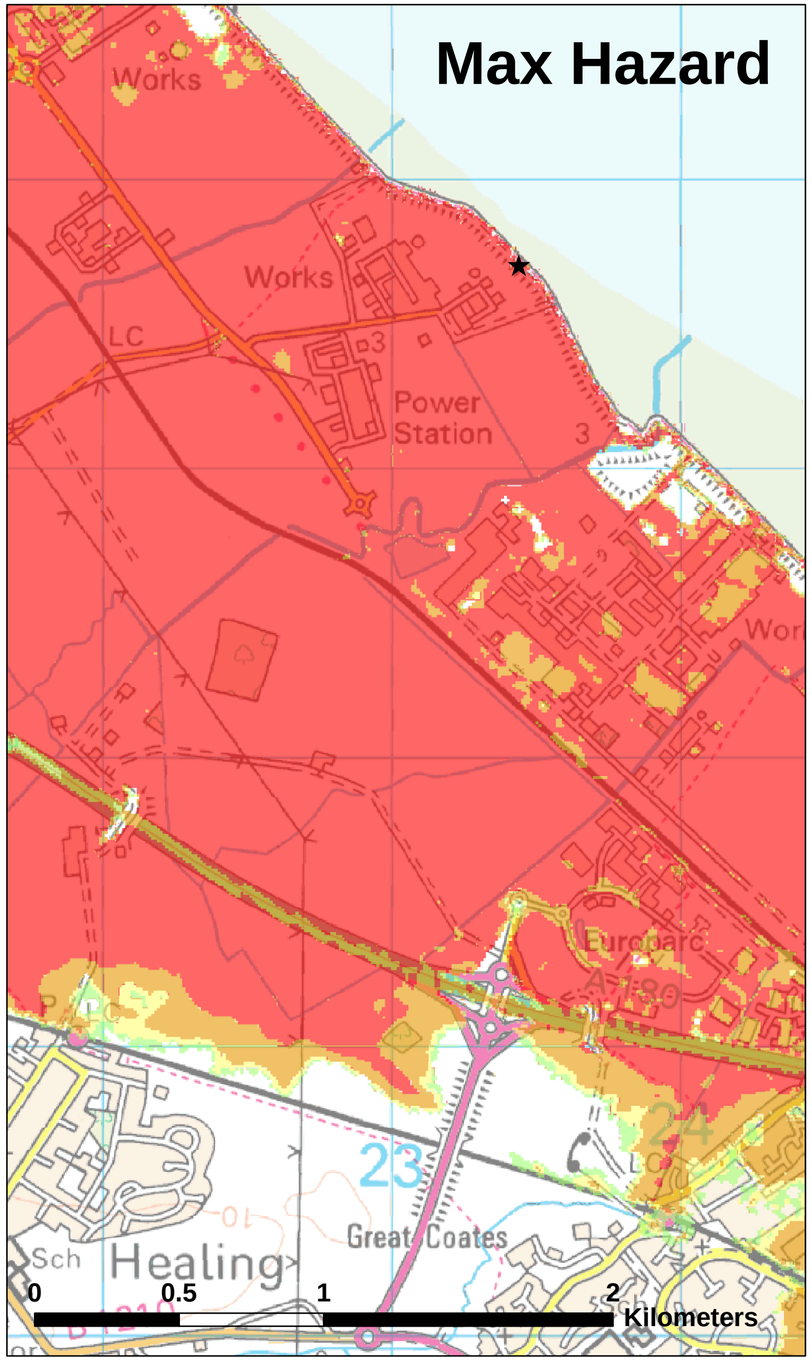
MAP REFERENCE (PROJECT NR./FIGURE NR./REVISION)

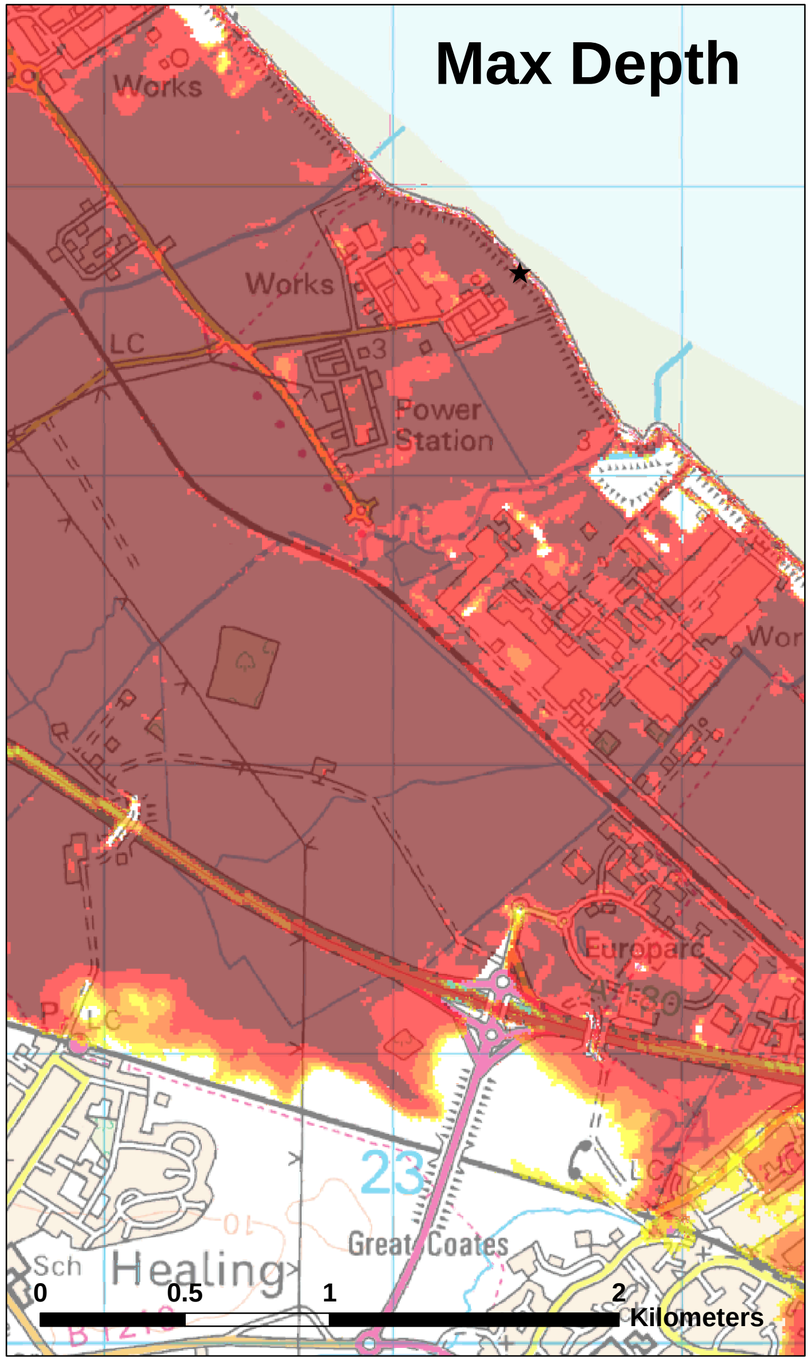
257248/H14.2115.1000/1

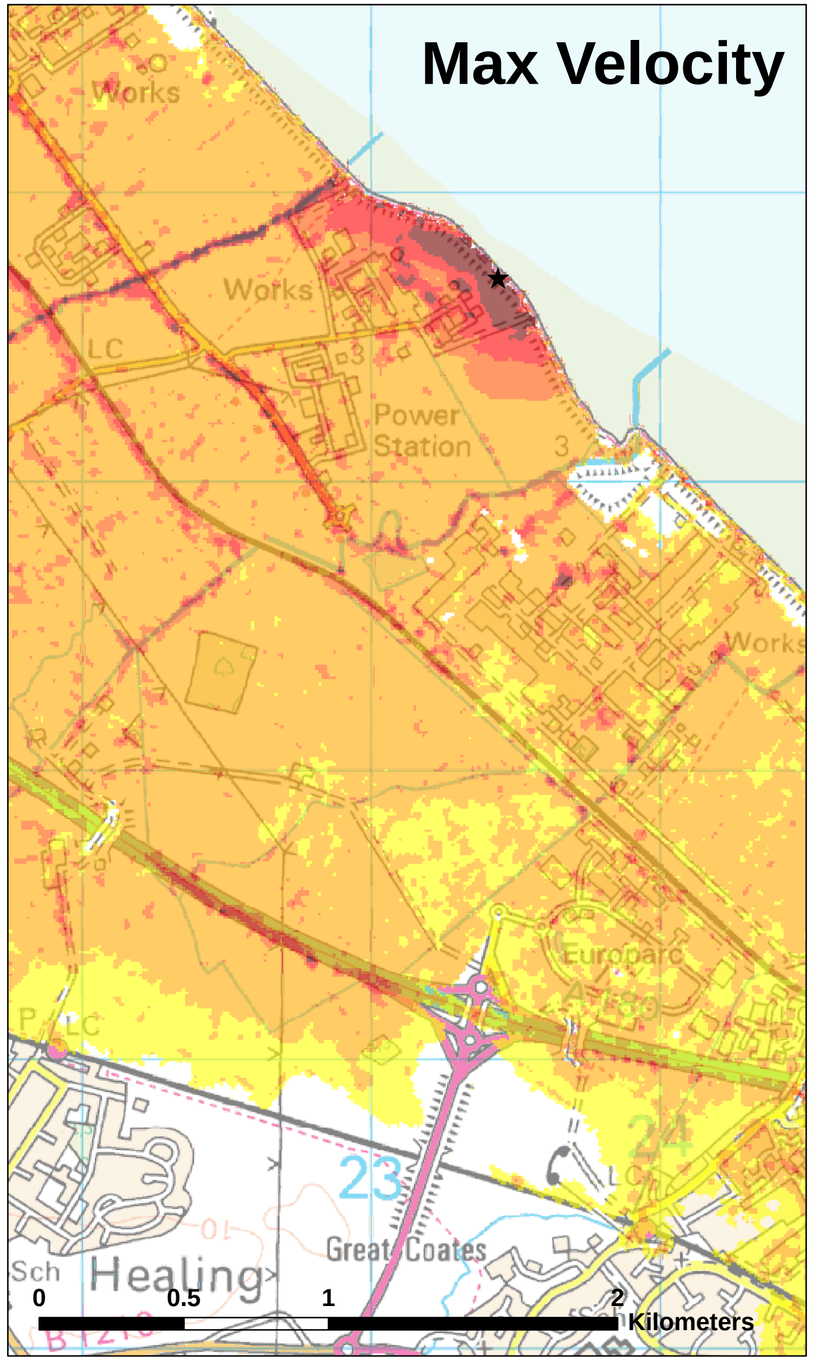
Mott MacDonald

for

Environment Agency







Hazard Rating

- 0 - 0.75
- 0.75 - 1.25
- 1.25 - 2
- >2

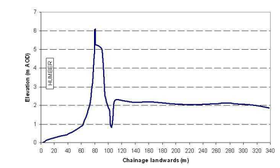
Depth (m)

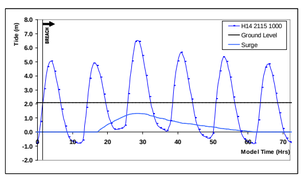
- 0 - 0.25
- 0.25 - 0.5
- 0.5 - 1
- 1 - 2
- >2

Velocity (m/s)

- 0 - 0.3
- 0.3 - 1
- 1 - 1.5
- 1.5 - 2.5
- >2.5

Breach	**H14**	**Near**	**South of Immingham**	**Storm**	**1000 years**
Type	**Earth Bank**	**Width**	**50m**	**Year**	**2115**





Hazard Mapping Northern Area AN785: Maximums

ISSUE	PREPARED BY	CHECKED BY	APPROVED BY
1	KS	MP	SYE

DATE	PURPOSE OF MAP
SEPT 2009	Northern Tidal Flood Mapping

DIGITAL FILE PATH

P:\Cambridge\Demeter - Daedalus\WEM\PROJECTS\241496_Hazard Mapping\Report\Maps

MAP REFERENCE (PROJECT NR./FIGURE NR./REVISION)

257248/H14.2115.1000/1

Mott MacDonald

for

Environment Agency

Jo Somerton
Joanne.somerton@aecom.com

Our ref: CCN/2018/87235

Date: 5th June 2018

Dear Jo,

Provision of Flood Risk Information for a site on the South Humber Bank near Stallingborough, North East Lincolnshire.

Thank you for your request to use our flood risk information in the development of the Flood Risk Assessment (FRA) for the above site. The information is set out below and attached. It is important you read any contextual notes on the maps provided.

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.

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.

Historic Flood Extent Map

A copy of the Historic Flood Extent Map showing the extent of previous recorded flooding in your area is attached. This only covers information we hold and it is possible other flooding may have occurred which other organisations, such as the Local Authority or Internal Drainage Boards, may have records.

Fluvial Flood Risk Information

Fluvial Defence Information

The fluvial defences reducing the risk of flooding to this site consist of earth embankments until TA 22595 12752. They are in fair condition and reduce the risk of flooding to a 1% (1 in 100) chance of occurring in any year. We inspect these defences routinely to ensure potential defects are identified. From TA 22595 12752 to the sea, there are no formal flood defences reducing the risk of flooding to this site. The nearby 'main river' channel reduces the risk of flooding to a 1% (1 in 100) chance of occurring in any year.

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.

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.

Tidal Flood Risk Information

Tidal Defence Information

The tidal defences protecting this site consist of concrete floodwalls.

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

Tidal Flood Levels

The attached table shows our current best estimate for extreme tide levels.

Levels for the Humber Estuary have an assessment date of 2014, with others having an assessment date of 2006, which should be used in any consideration of future increases due to climate change.

Modelled 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. Hazard mapping is also available for fluvial flood risk in Northampton, Lincoln, Brigg, Wainfleet and some isolated rural locations.

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

Hazard Mapping – Breaching
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.

- Year 2006 0.5% (1 in 200) chance
- Year 2006 0.1% (1 in 1000) chance
- Year 2115 0.5% (1 in 200) chance
- Year 2115 0.1% (1 in 1000) chance

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 2006 0.5% (1 in 200) chance
- Year 2006 0.1% (1 in 1000) chance
- Year 2115 0.5% (1 in 200) chance
- Year 2115 0.1% (1 in 1000) chance

Development Planning
If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of our information for Flood Risk Assessments. We recommend that you undertake a formal pre-application enquiry using the form available from the website.

https://www.gov.uk/planning-applications-assessing-flood-risk

https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

Climate change will increase flood risk due to overtopping of defences. Please note 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 February 2016. 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.

Supporting Information
Please see the Standard Notice or licence for details of permitted use. The Standard Notice can be found at the link below.
http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

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).

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

Other Flood Risk Management Authorities

The information provided with this letter relates to flood risk from main river or the sea. Additional information may be available from your Lead Local Flood Authority (ie county council or unitary authority) or, where they exist, the Internal Drainage Board.

Further Contact

I hope we have correctly interpreted your request. If you are not satisfied with our response to your request for information, you can contact us within two calendar months to ask for our decision to be reviewed.

If you have any queries or would like to discuss the content of this letter further please contact Antonia MacDonald using the details below.

Yours sincerely,

[redacted]

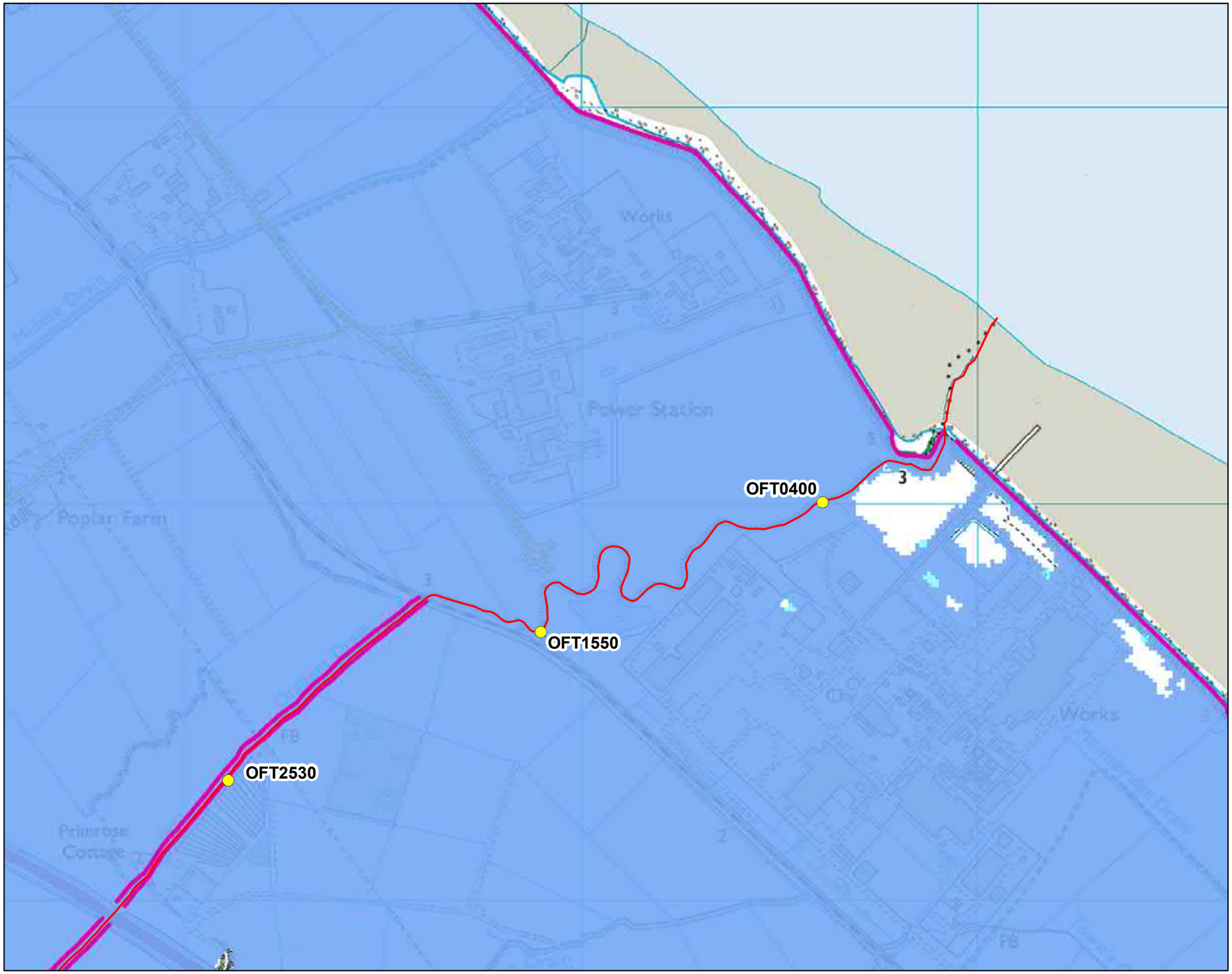
FOR Claire Rose
Partnerships and Strategic Overview Team Leader - South Humber and East Coast

Direct dial [redacted]
Direct e-mail PSO_Coastal@environment-agency.gov.uk

Enc.
Flood Map
Historic Flood Extent Map
Modelled Fluvial and Flows Data Sheet
Modelled Flood Extent Maps
Estimated Tide Levels
Tidal Breach Locations Map
Hazard Mapping – Breaching (4 maps)
Hazard Mapping – Overtopping (4 maps)

Awarded to Lincolnshire & Northamptonshire Area

Flood Map centred on TA 23088 13043 - created June 2018 [Ref: CCN-2018-87235]



Environment Agency

Scale 1:10,000

N
W E
S

- Modelled Nodes
- Main River
- Raised Defences
- Flood Storage Areas
- Area at Risk of Flooding from Rivers or The 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.

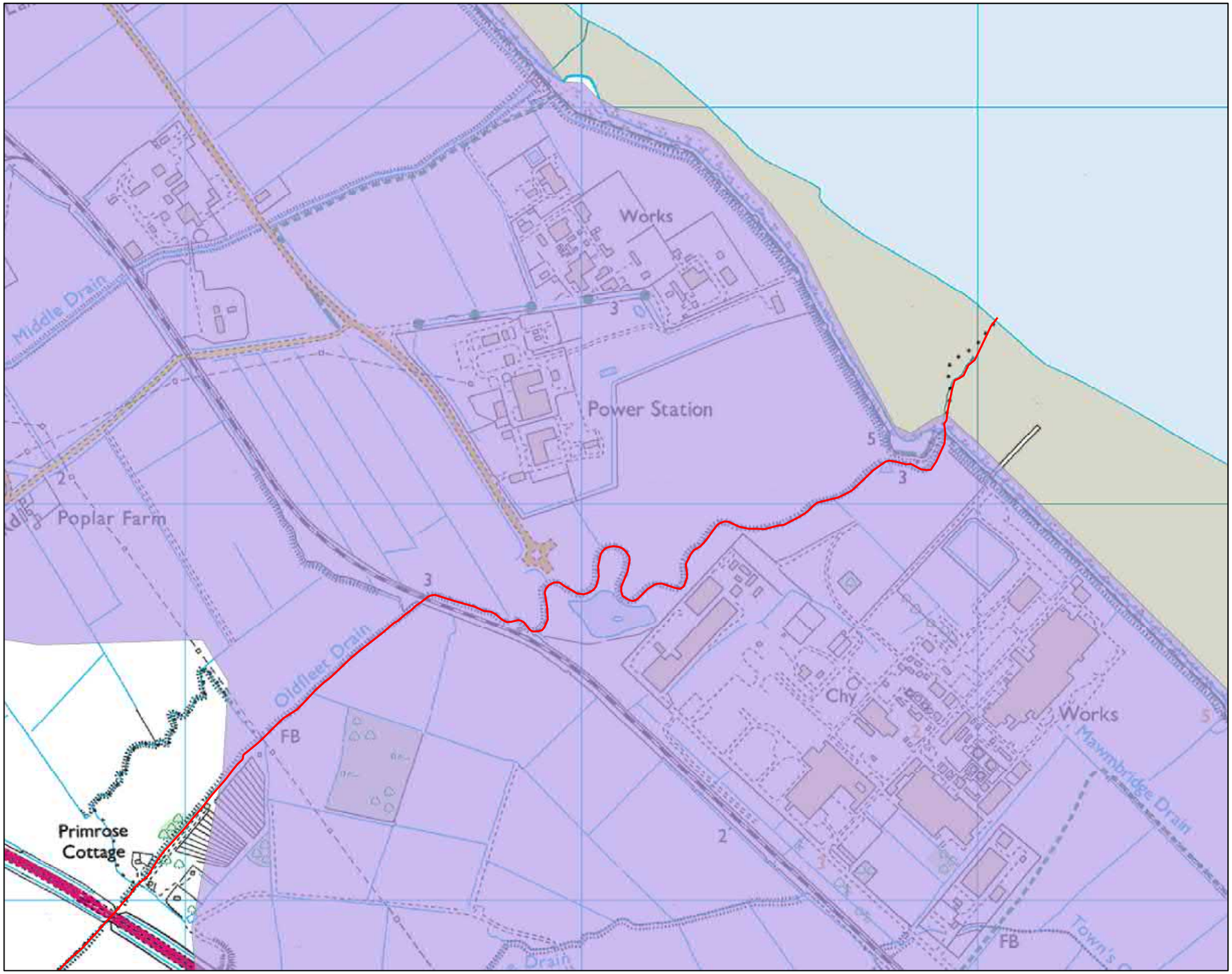
Light blue shows the extent of the Extreme Flood Outline, which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

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.

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

Historic Flood Extent Map centred on TA 23088 13043 - created June 2018 [Ref: CCN-2018-87235]



Environment Agency

Scale 1:10,000

N
W E
S

Main River

January 1953 along the Lincolnshire Coastline

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

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)	0.1% (1 in 1000)	0.1% (1 in 1000) inc 20% Climate Change
OFT2530	522109	412303	2.45	2.54	2.56	2.57	2.57	2.58	2.58	2.58	2.58	2.58	2.58	2.58
OFT1550	522898	412678	2.44	2.54	2.55	2.57	2.57	2.58	2.58	2.58	2.58	2.58	2.58	2.58
OFT0400	523610	413005	2.43	2.54	2.55	2.56	2.57	2.58	2.58	2.58	2.58	2.58	2.58	2.58

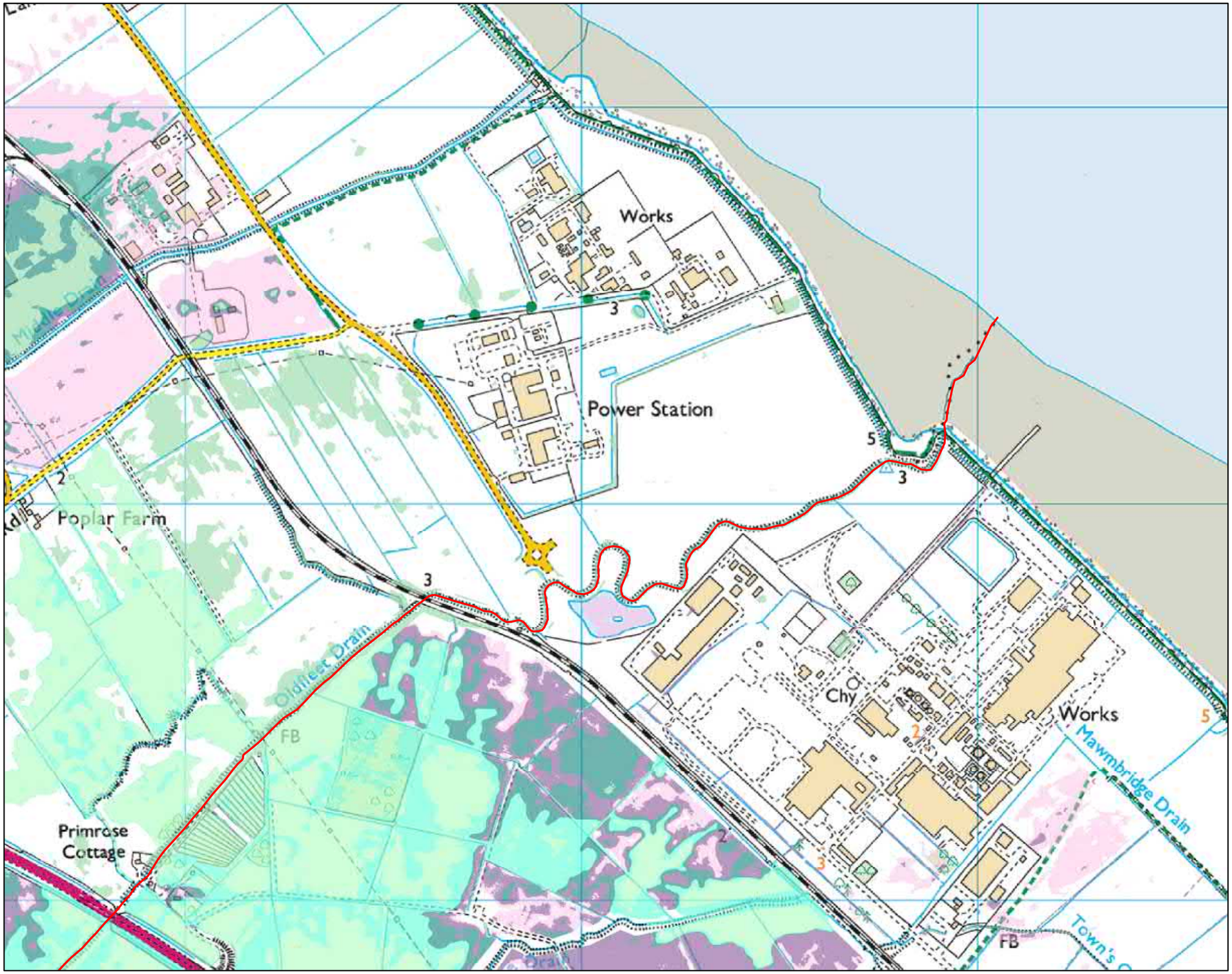
Fluvial Flood Flows (m^3/s)

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 (m^3/s).

			Annual Exceedance Probability - Maximum Flows (m^3/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)	0.1% (1 in 1000)	0.1% (1 in 1000) inc 20% Climate Change
OFT2530	522109	412303	1.81	2.33	2.64	2.93	3.05	3.21	3.24	3.25	3.27	3.26	3.29	3.29
OFT1550	522898	412678	2.55	2.98	3.05	3.36	3.51	3.31	3.32	3.33	3.34	3.33	3.33	3.33
OFT0400	523610	413005	4.88	5.36	5.06	5.90	6.40	4.33	4.33	4.33	4.27	4.33	4.34	4.27

Modelled Flood Extents (with defences) Oldfleet Drain and Stallingborough North Beck Model - April 2009

Map centred on TA 23088 13043 - created June 2018 [Ref: CCN-2018-87235]



Environment Agency

Scale 1:10,000

N
W E
S

Modelled Flood Extents (with defences)

- Main River
- 5% (1 in 20) Fluvial Event
- 1% (1 in 100) Fluvial Event
- 1% (1 in 100) Fluvial Event inc Climate Change
- 0.1% (1 in 1000) Fluvial Event
- 0.1% (1 in 1000) Fluvial Event inc Climate Change

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

Tidal Level Location Map
Lincolnshire & Northamptonshire Area

Tidal Water Levels for the South Humber, East Coast and The Wash

The table below shows still water levels for locations, from the above location map, around the South Humber Estuary, East Coast and The Wash. It is important to note the following:

- The base date for the data is 2014 for the South Humber and 2006 for the East Coast and The Wash.
- The data 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.
- The water level quoted is the 'Best Estimate' water level. Depending on the use of the data it may be necessary to carry out sensitivity testing. Upper and Lower 95% confidence bandings are available upon request.
- Levels for other annual chance scenarios are available if required.

Ref	Location	Easting	Northing	Annual Chance (1 in x) of Tide Level					
				metres ODN					
				1	10	50	100	200	1000
HUMBER									
H030	Tetney	535420	403180	3.94	4.29	4.56	4.69	4.82	5.15
H050	Buck Beck	532700	406580	4.03	4.36	4.62	4.74	4.87	5.18
H060	Grimsby	527878	411346	4.10	4.43	4.70	4.82	4.95	5.27
H080	Haborough Marsh	520790	415740	4.26	4.61	4.88	5.01	5.14	5.47
H090	Immingham	519141	417449	4.26	4.61	4.88	5.01	5.14	5.47
H100	South Killingholme	518700	417120	4.41	4.77	5.05	5.18	5.32	5.66
H130	North Killingholme	516530	420000	4.51	4.87	5.15	5.28	5.42	5.77
H150	East Halton	514450	422870	4.59	4.96	5.25	5.39	5.53	5.89
H170	Goxhill	511970	425440	4.67	5.04	5.34	5.47	5.61	5.95
H200	New Holland	508020	424330	4.87	5.26	5.55	5.68	5.81	6.12
H210	Barrow Haven	506380	422620	4.92	5.31	5.60	5.73	5.86	6.17
H220	Ferriby	497550	421150	5.04	5.42	5.67	5.77	5.86	6.04
H230	Winterton	493420	422830	5.14	5.51	5.74	5.83	5.90	6.02
H250	Blacktoft	484247	424190	5.25	5.62	5.83	5.90	5.96	6.04
H270	Goole	474857	422960	5.46	5.85	6.07	6.15	6.21	6.29
East Coast									
~	Great Eau	545500	393800	3.80	4.19	4.46	4.57	4.69	4.96
~	Boygrift	553300	379800	3.84	4.24	4.53	4.65	4.77	5.05
~	Burgh Sluice	555190	358620	4.26	4.45	4.76	4.90	5.03	5.34
Wash									
~	Hobhole	536610	339940	4.82	5.30	5.64	5.78	5.93	6.27
~	Lawyers Sluice	540750	334550	4.84	5.32	5.66	5.80	5.95	6.29
~	West Lighthouse	549150	325750	4.88	5.37	5.71	5.86	6.01	6.35
~	Grand Sluice	532400	344500	4.88	5.33	5.65	5.78	5.93	~
~	Fosdyke Bridge	531700	332200	4.91	5.38	5.71	5.85	5.99	~
~	Marsh Road	526000	324000	5.04	5.44	5.73	5.85	5.98	~
~	Wisbech	546100	310000	4.83	5.25	5.53	5.66	5.78	~
~	Dog In Doublet	527300	299300	3.67	4.00	4.22	4.32	4.42	~

^ **Modelled Breach Locations**

0 3.5 7 14 Kilometres

This map indicates the location of where we have modelled the consequence of breaches in the defences along the coastline and tidal rivers. We have mapped the 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.

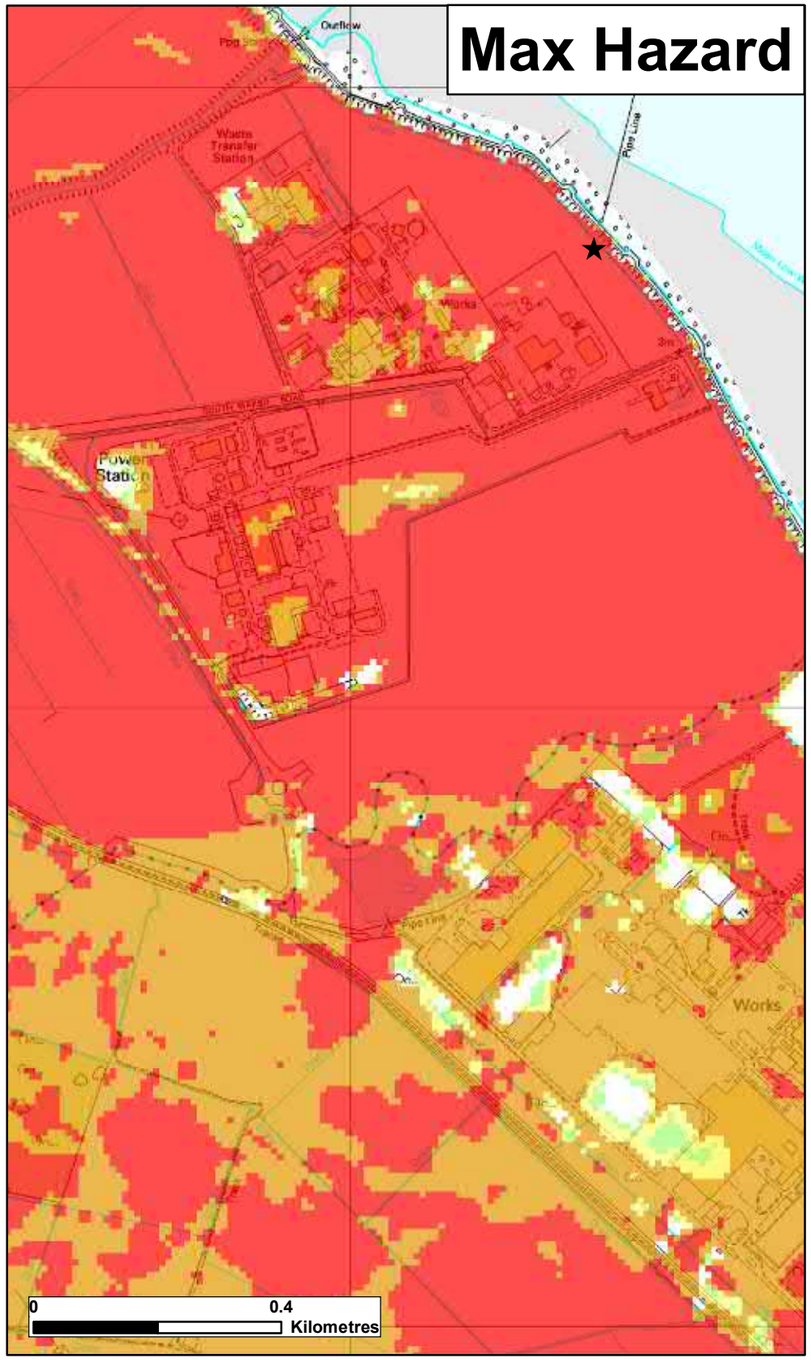
General Enquiries No: 03708 506 506.
Weekday daytime calls cost 5p plus up to 6ppm from BT Weekend Unlimited. Mobile and other providers charges may vary

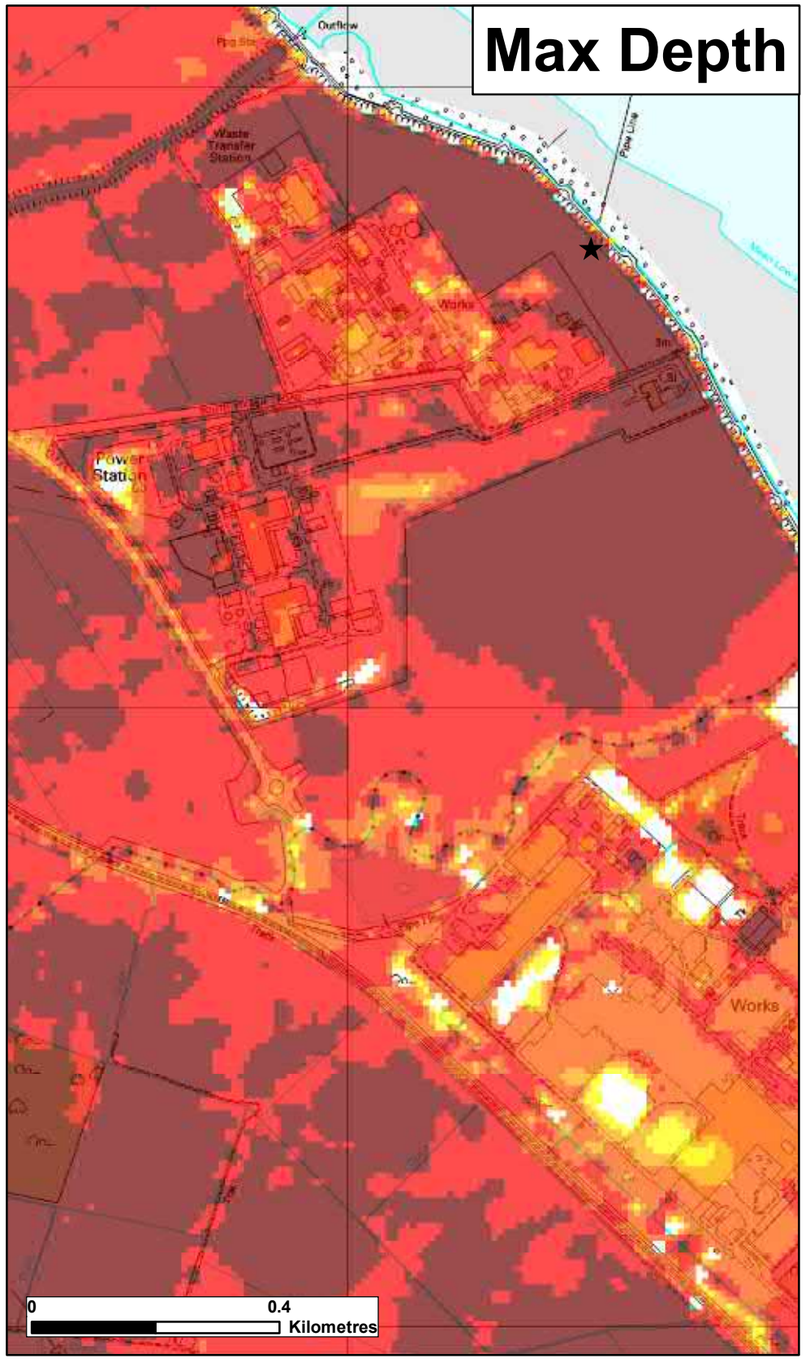
Environment Agency

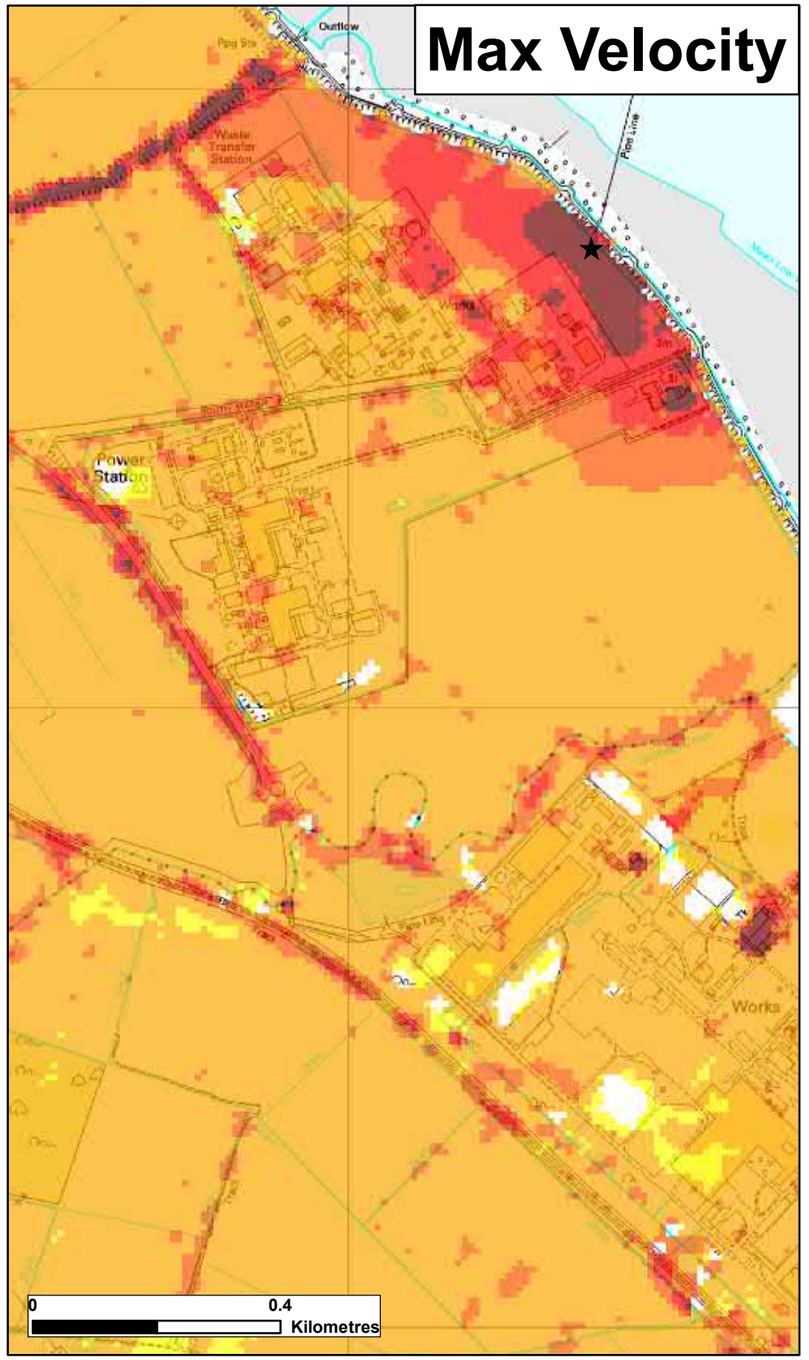
Produced by the Partnership and Strategic Overview Team, Lincoln
General Enquiries No: 03708 506 506

Northern Area Tidal Hazard Mapping

Location of Modelled Breaches







★ **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	June 2018	Scenario year	2006	Scenario Annual Chance	0.5% (1 in 200)	CCN Number	CCN-2018-87235

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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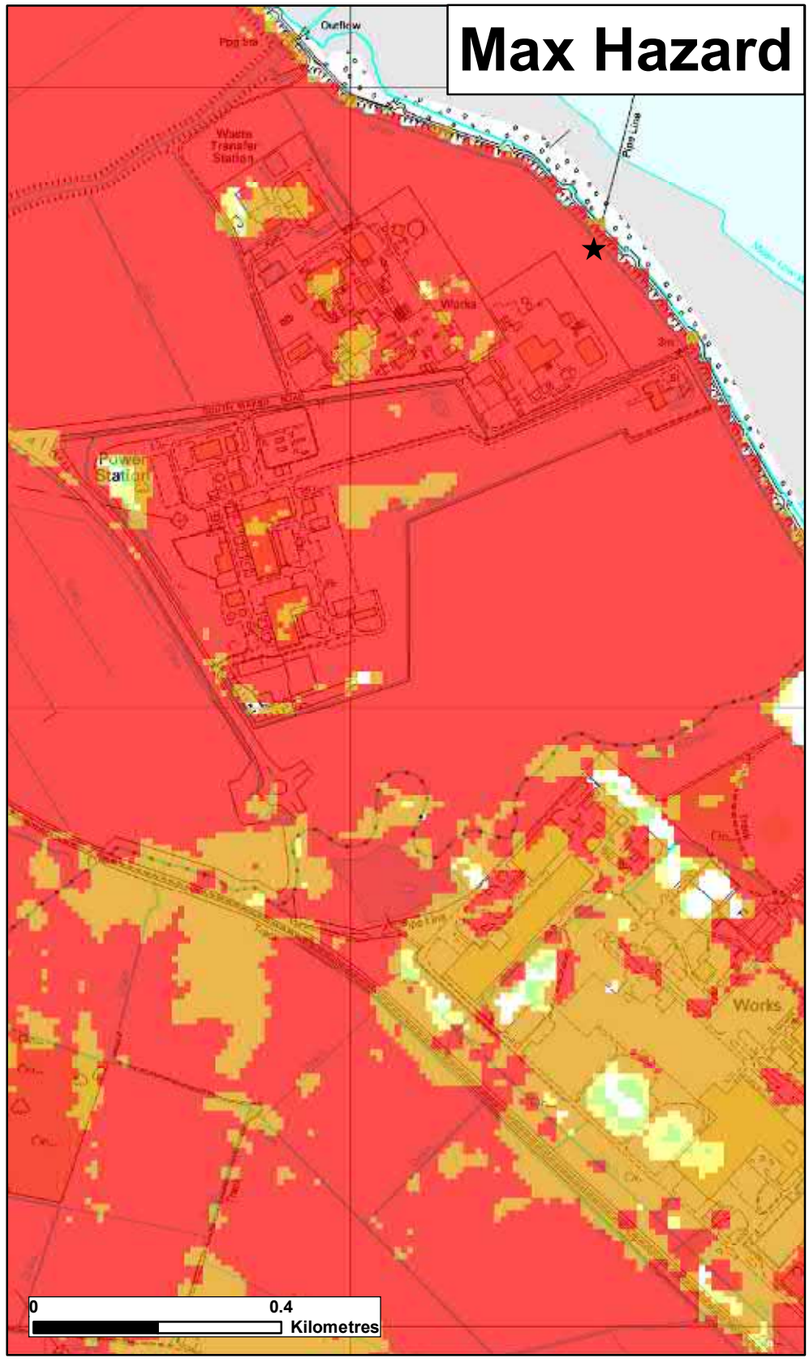
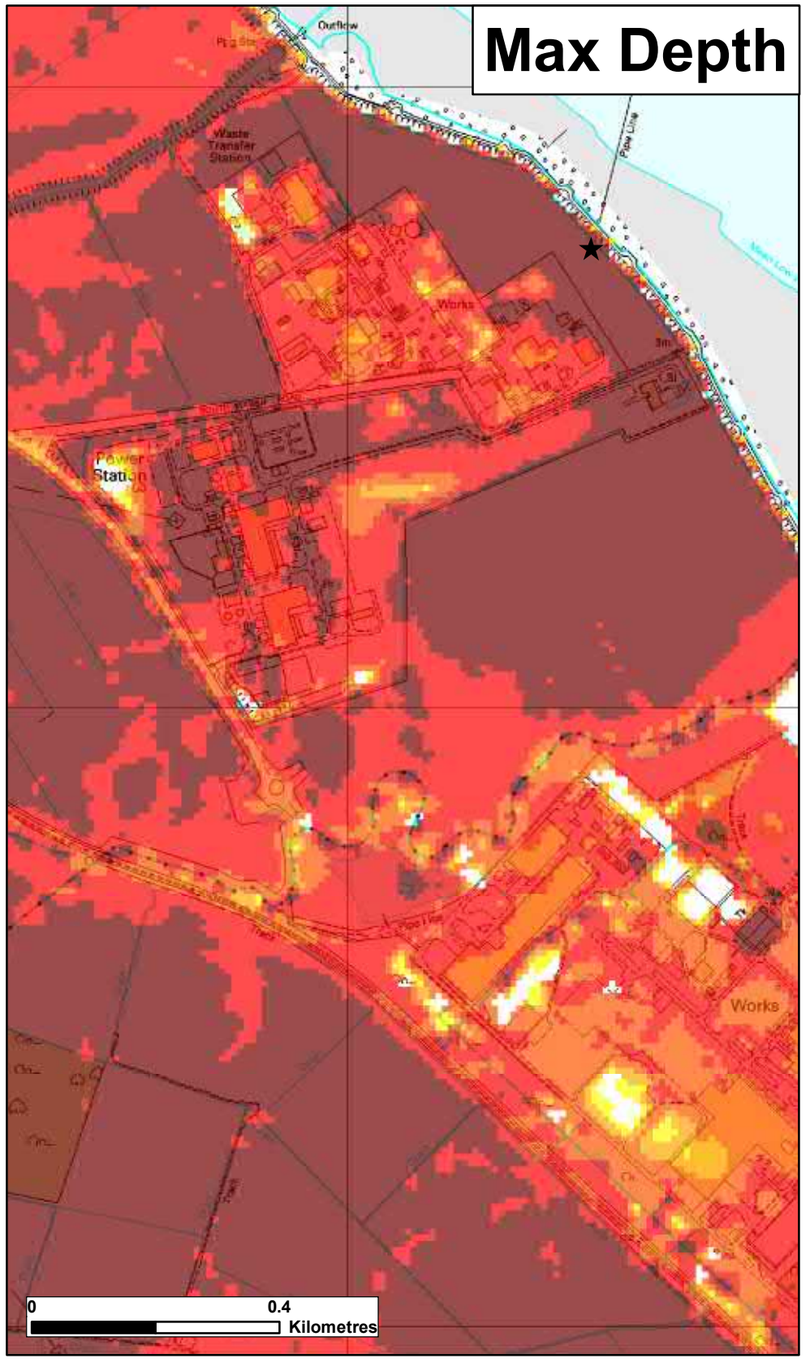
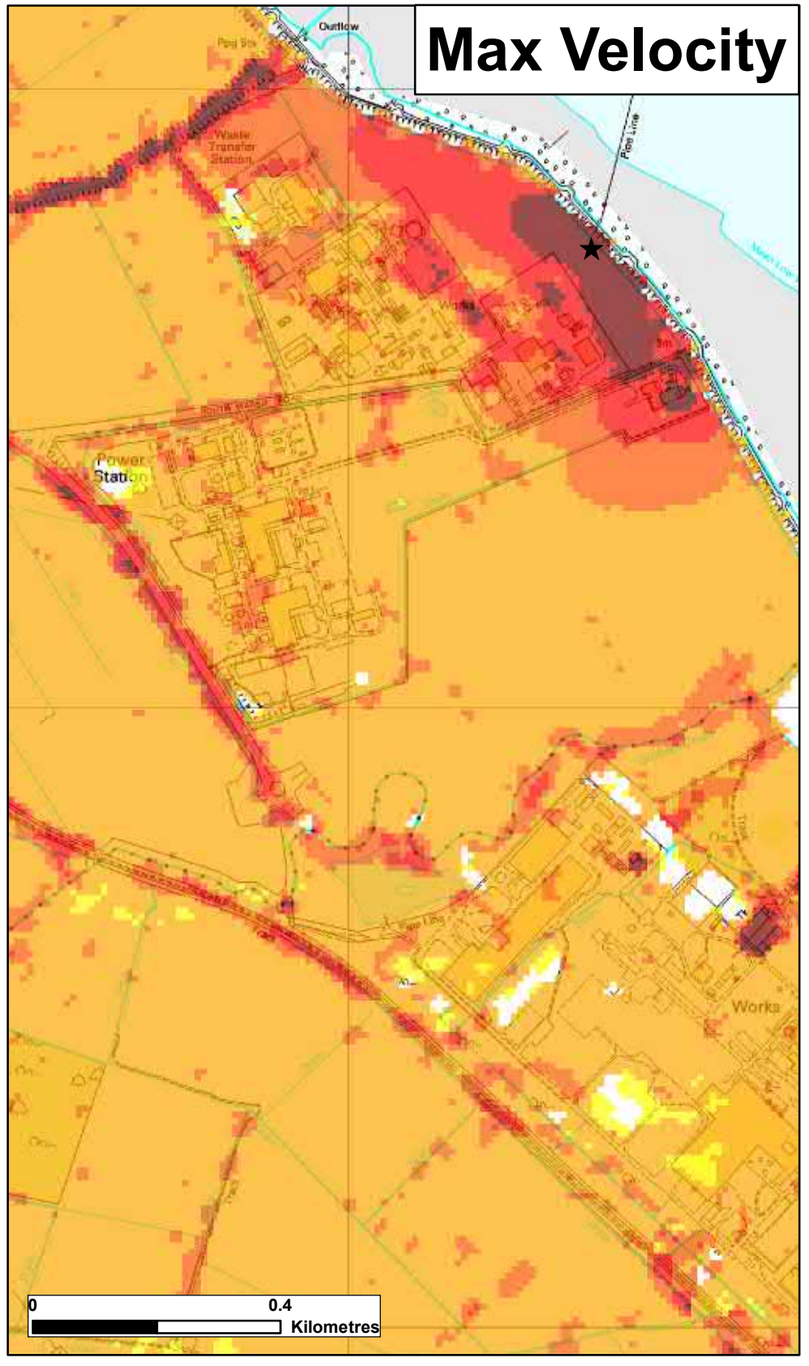
Environment Agency

Lincolnshire and Northamptonshire Breach Hazard mapping

Map Centred on TA 23088 13043







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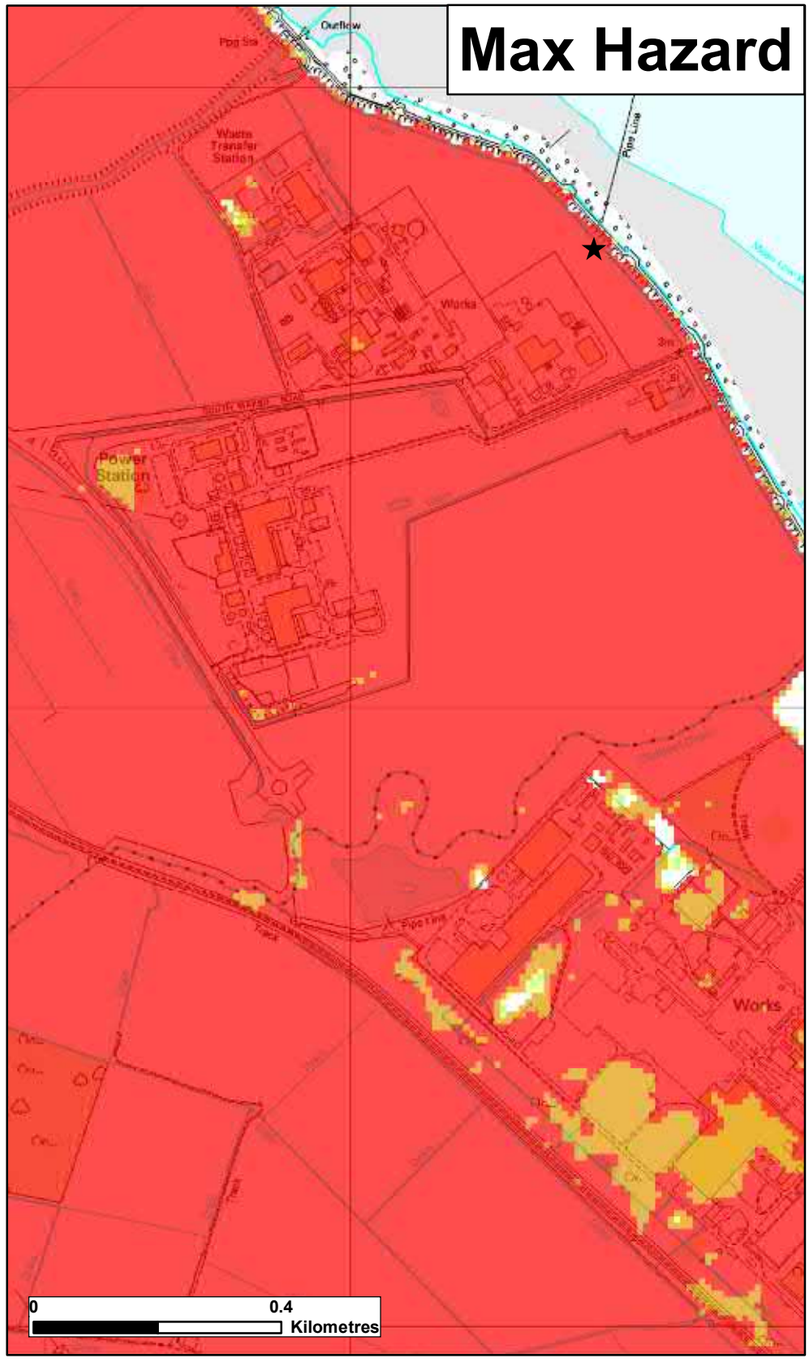
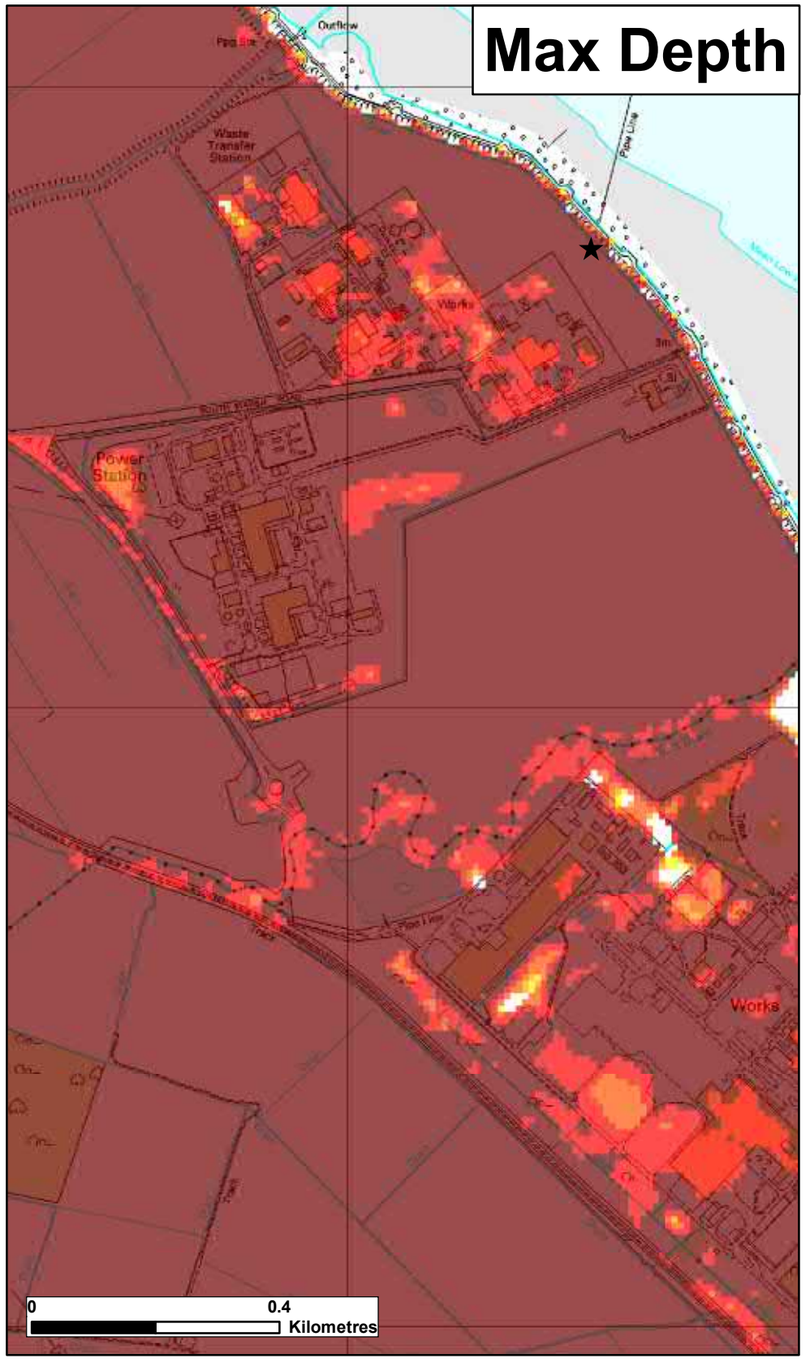
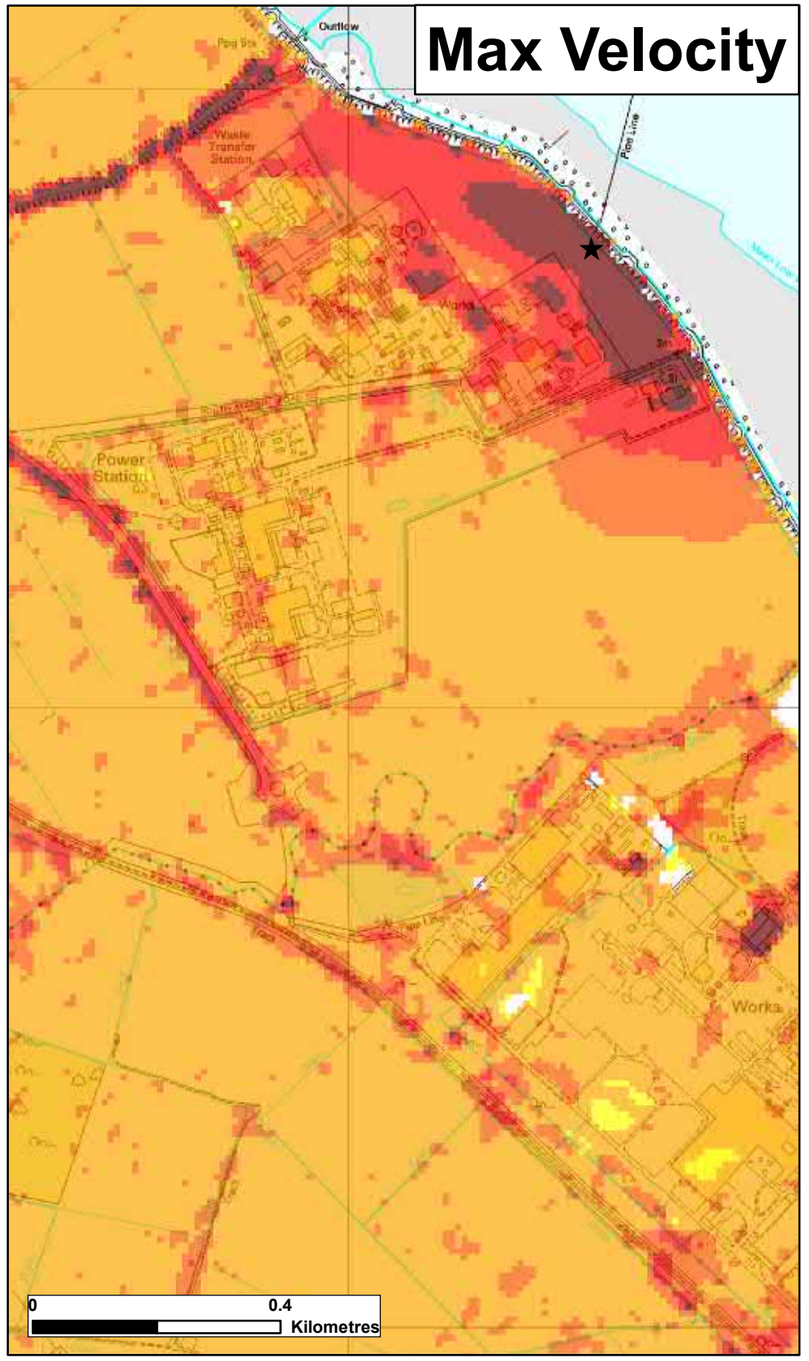
Map Centred on TA 23088 13043







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Date Printed	June 2018	Scenario year	2115	Scenario Annual Chance	0.5% (1 in 200)	CCN Number	CCN-2018-87235

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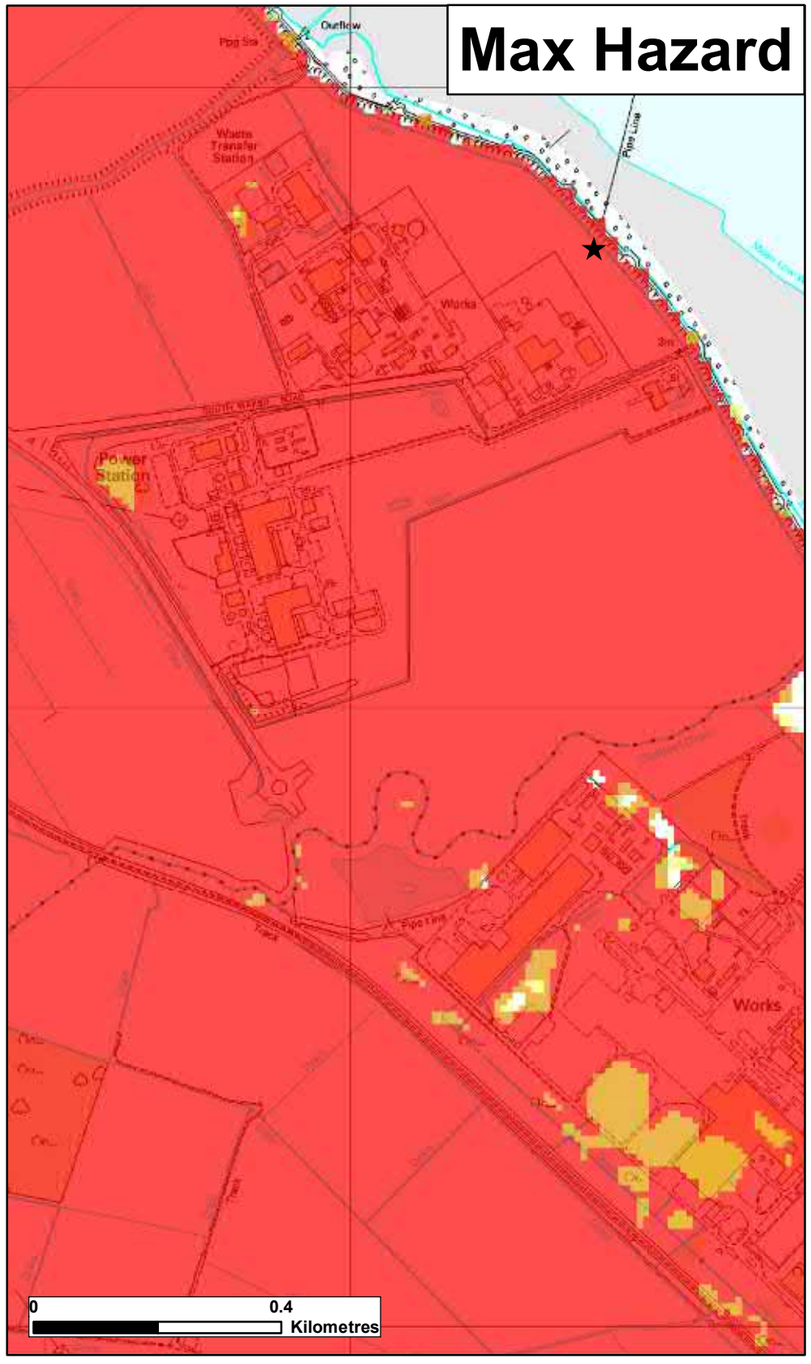

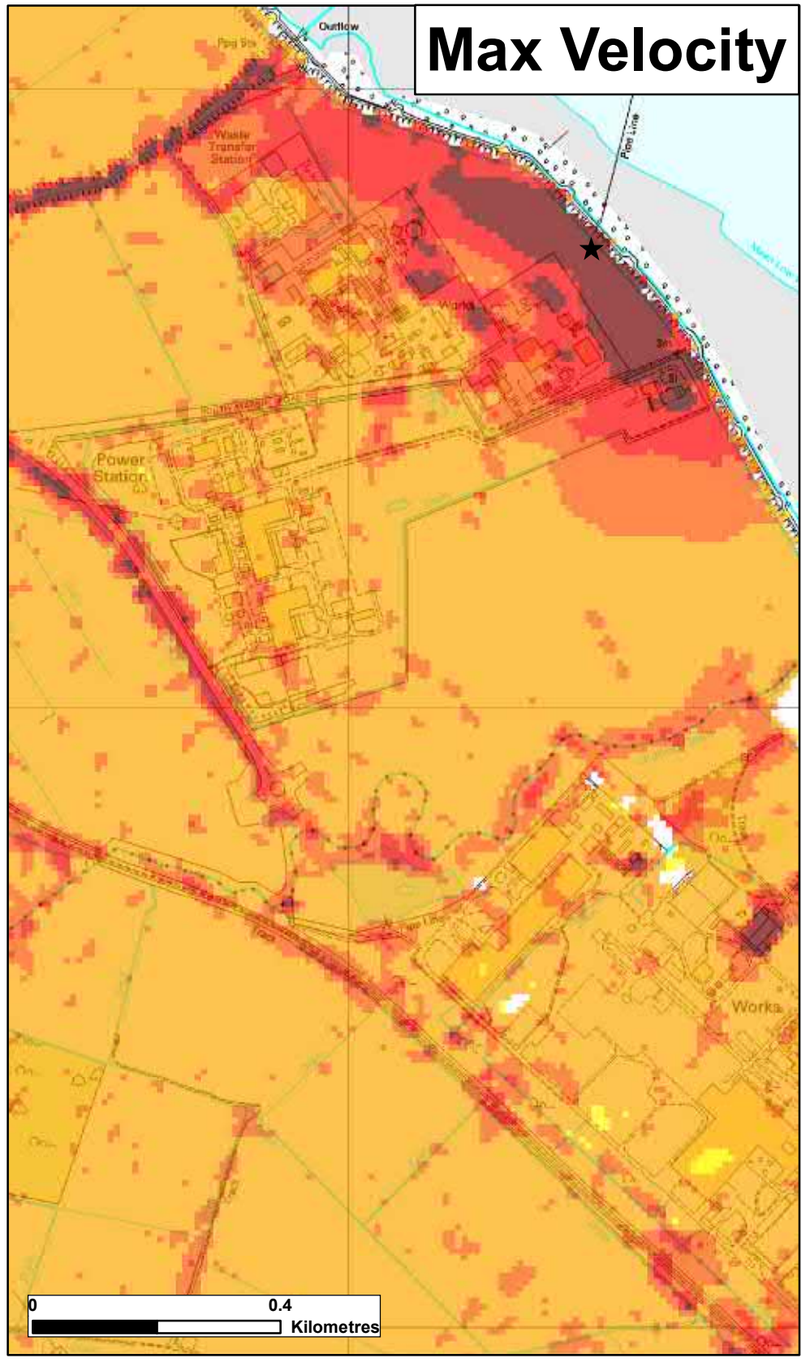

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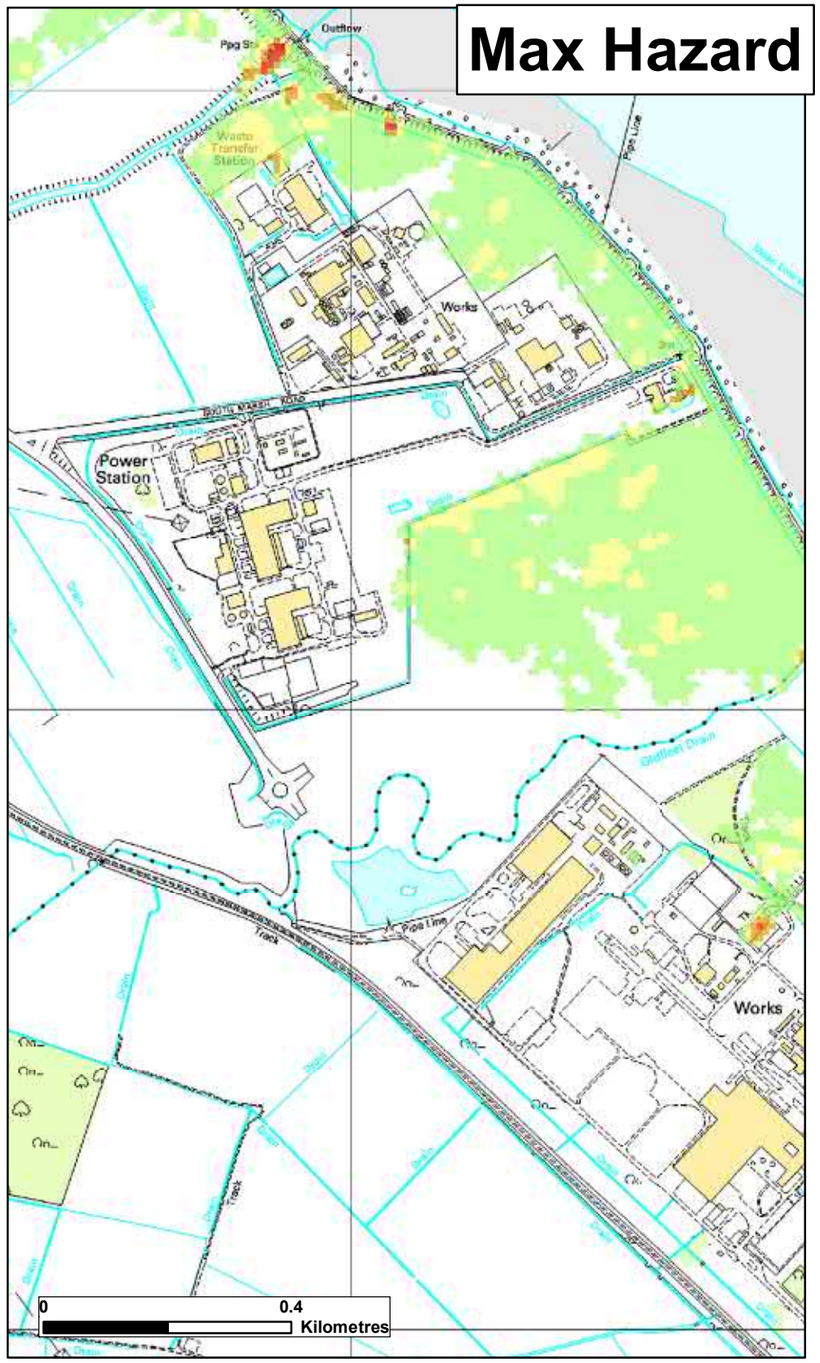

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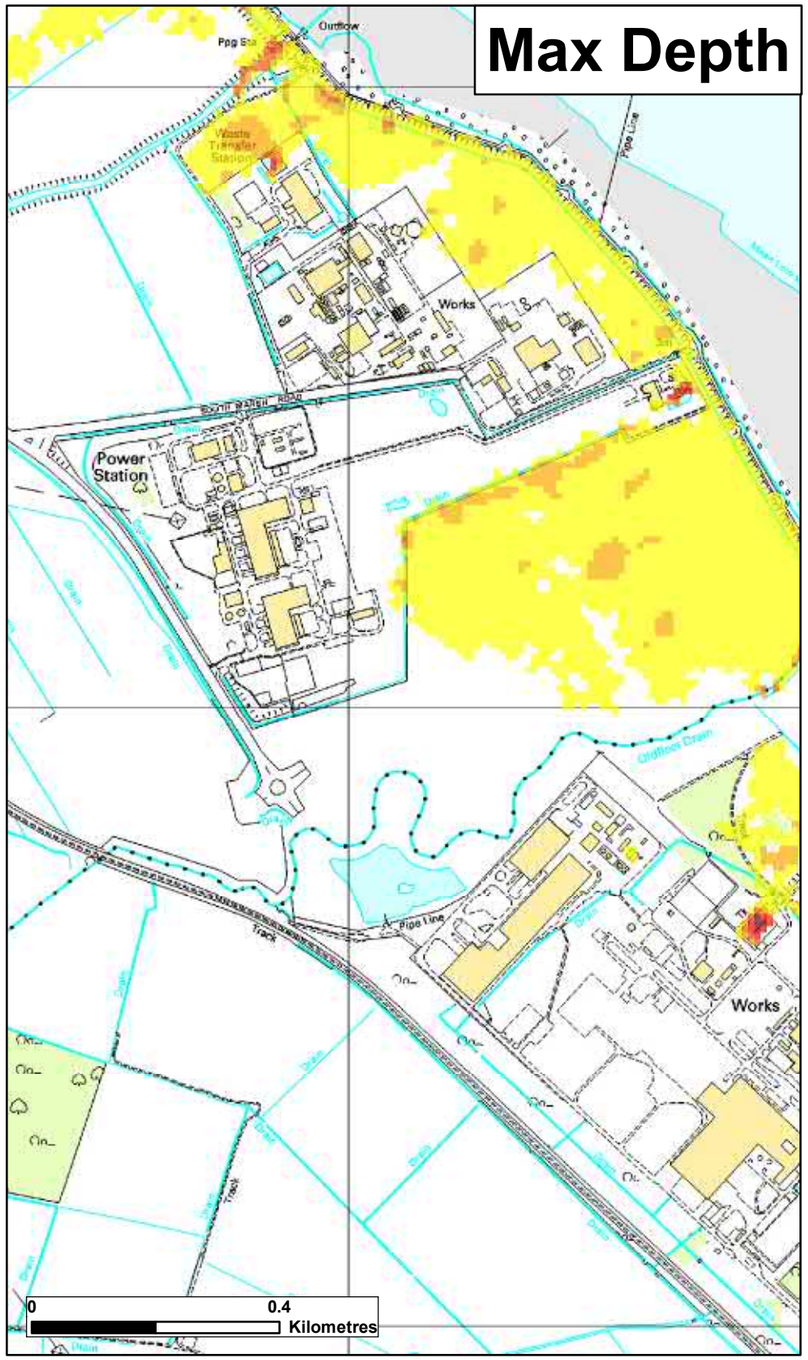

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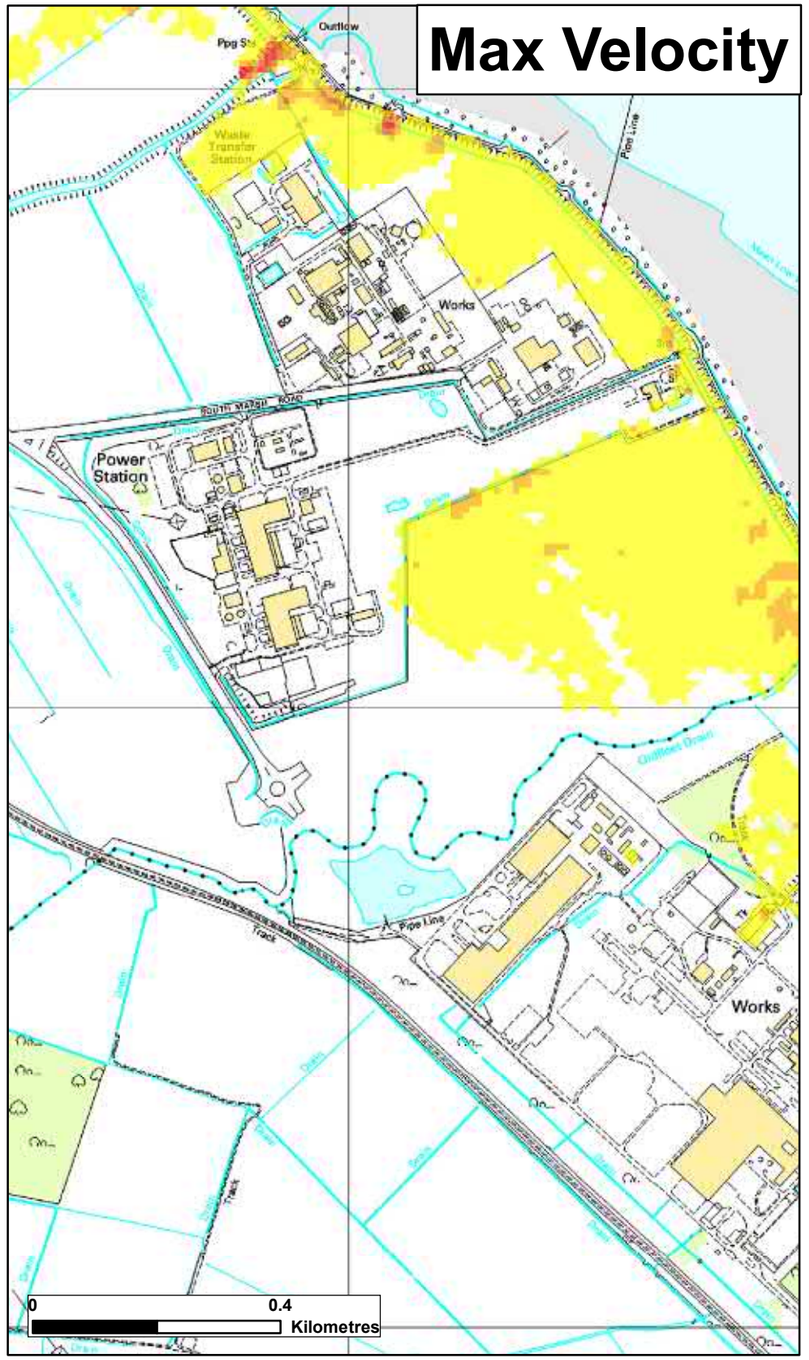

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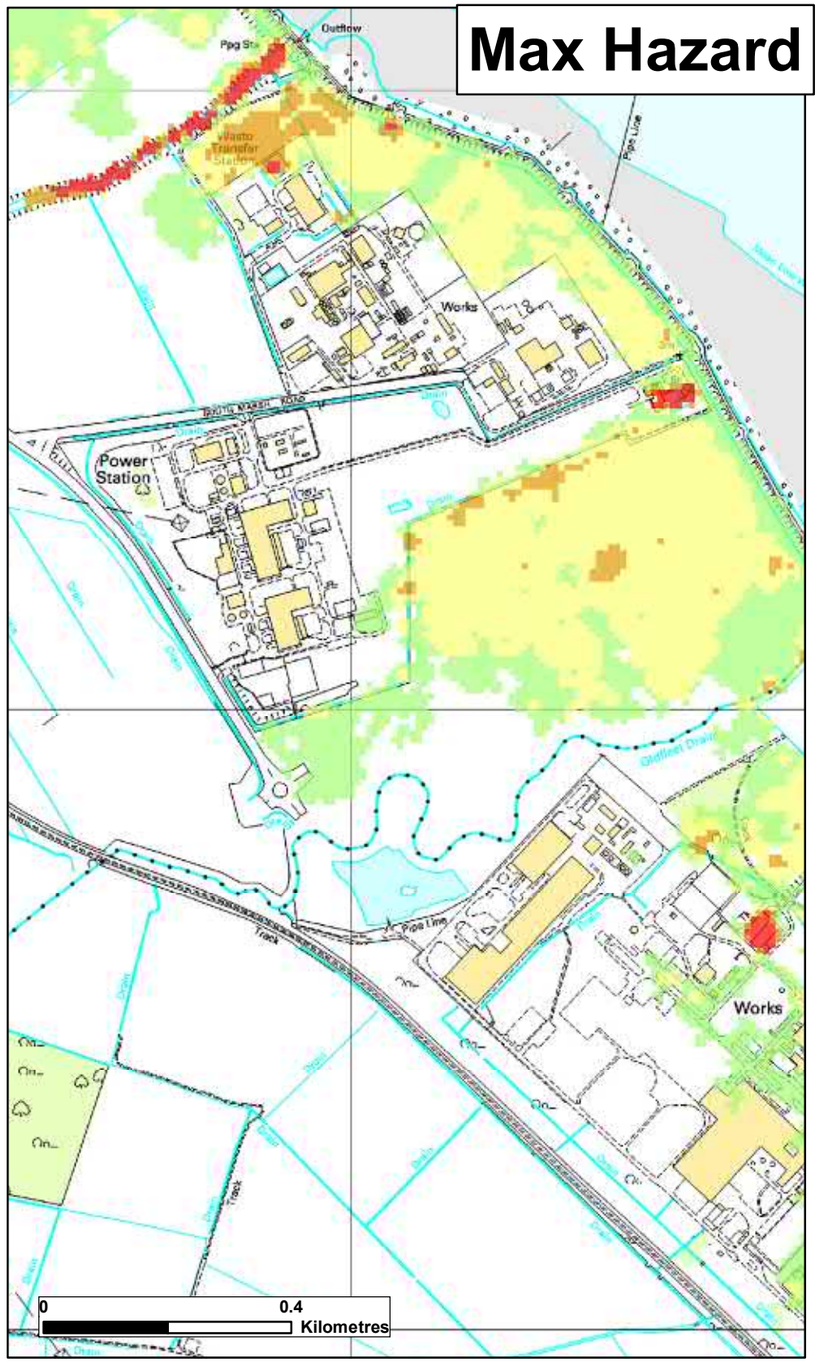
Environment Agency

Lincolnshire and Northamptonshire Overtopping Hazard Mapping

Map Centred on TA 23088 13043

Max Hazard



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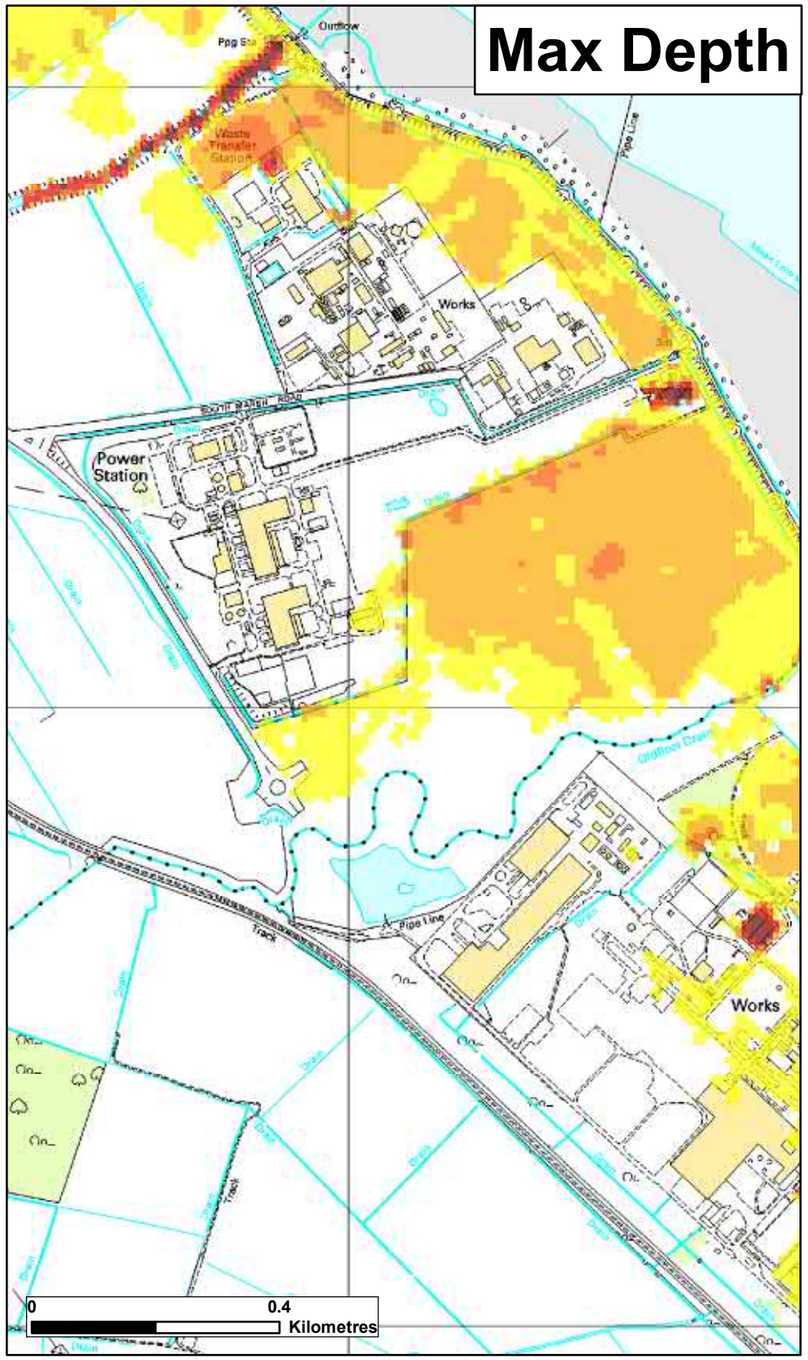

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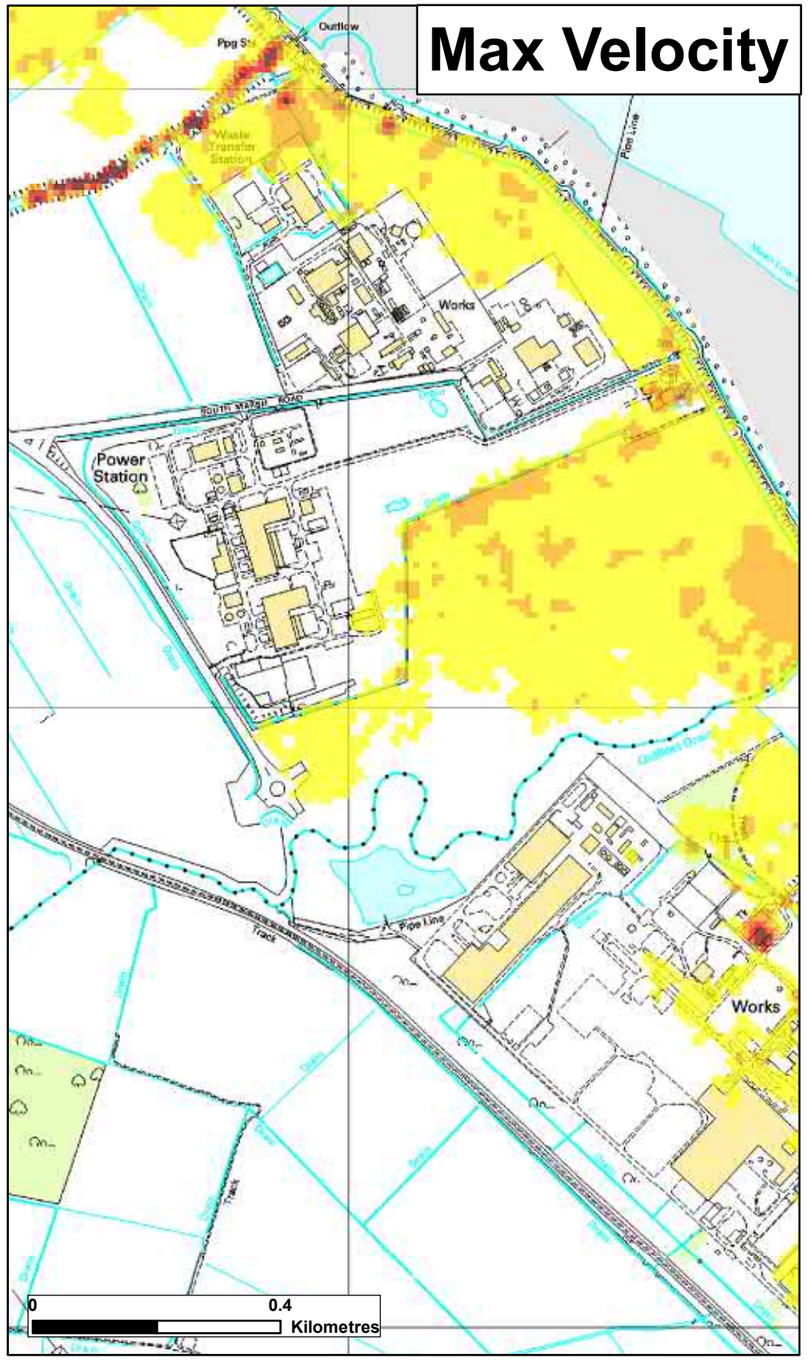

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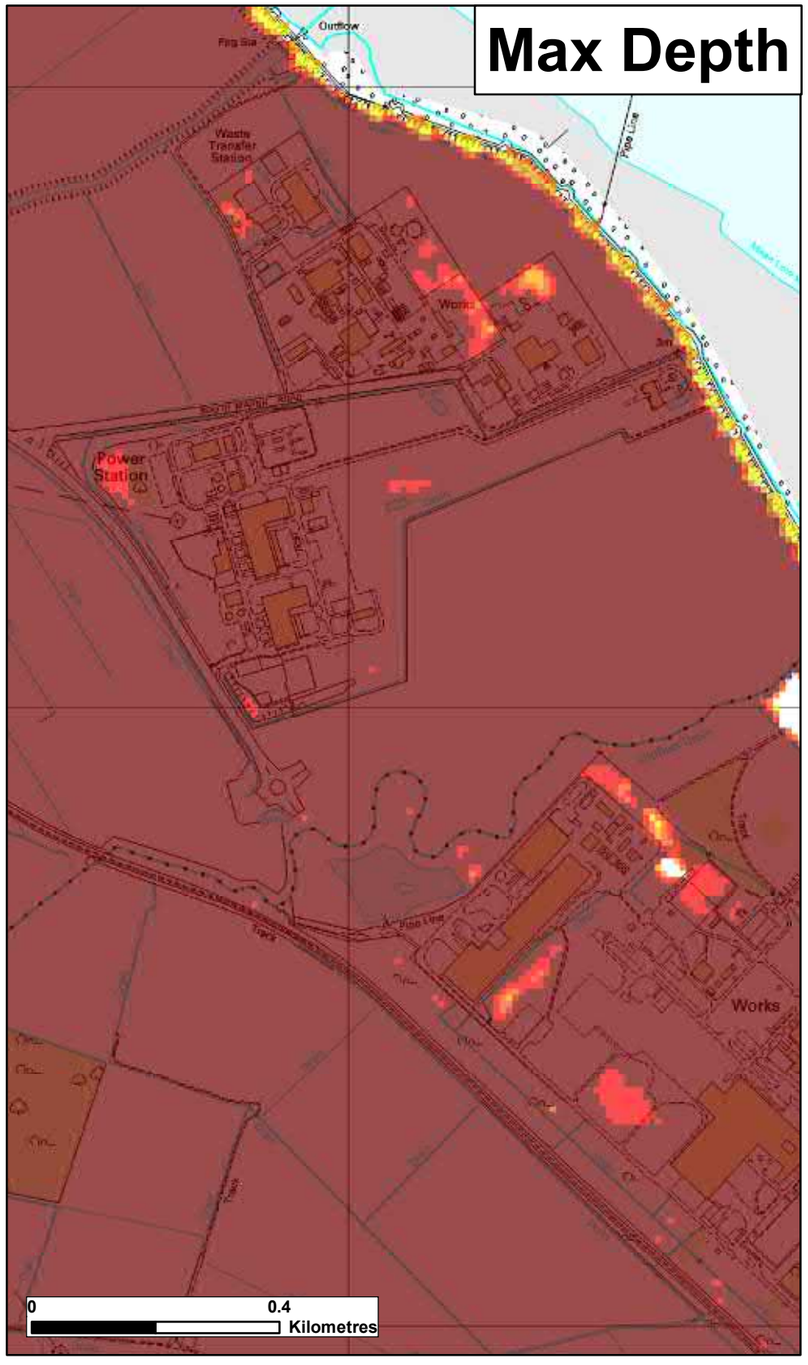

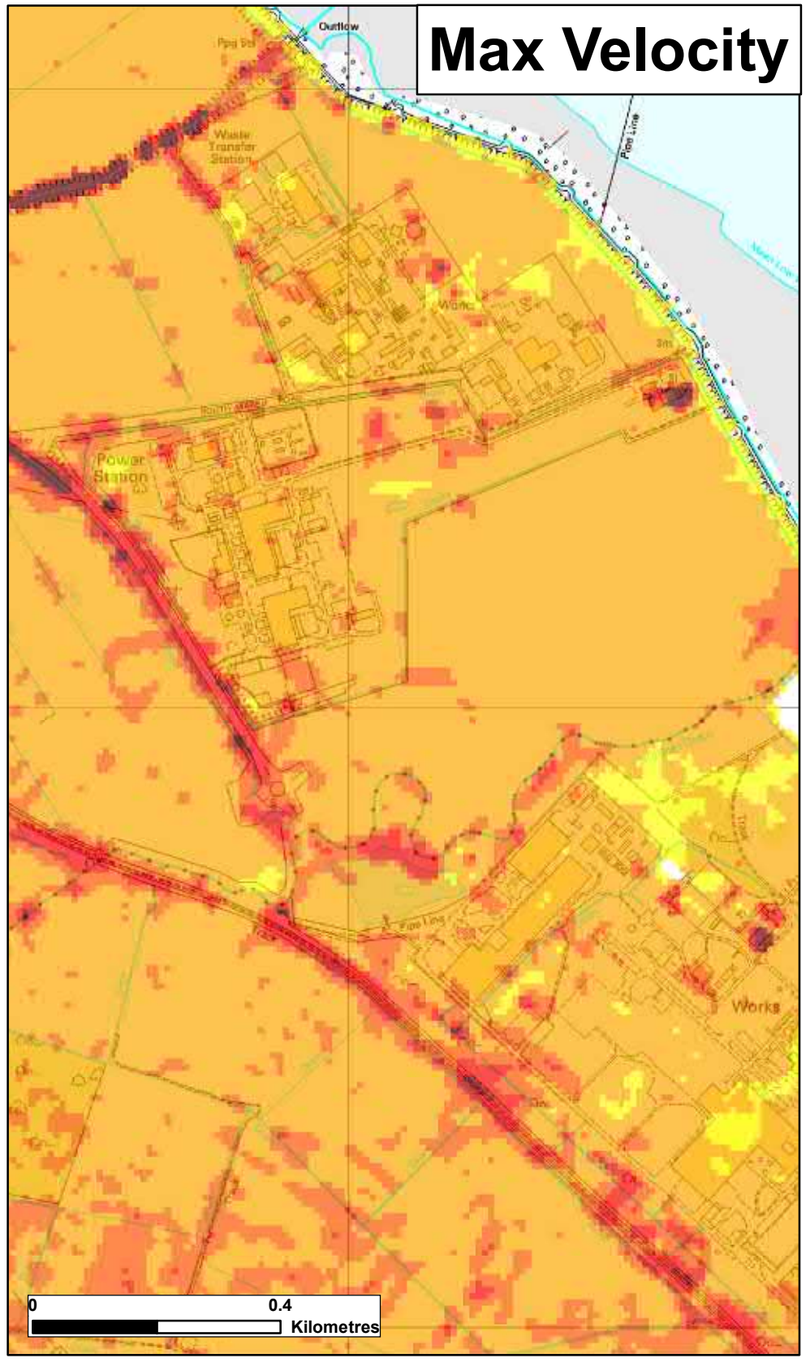

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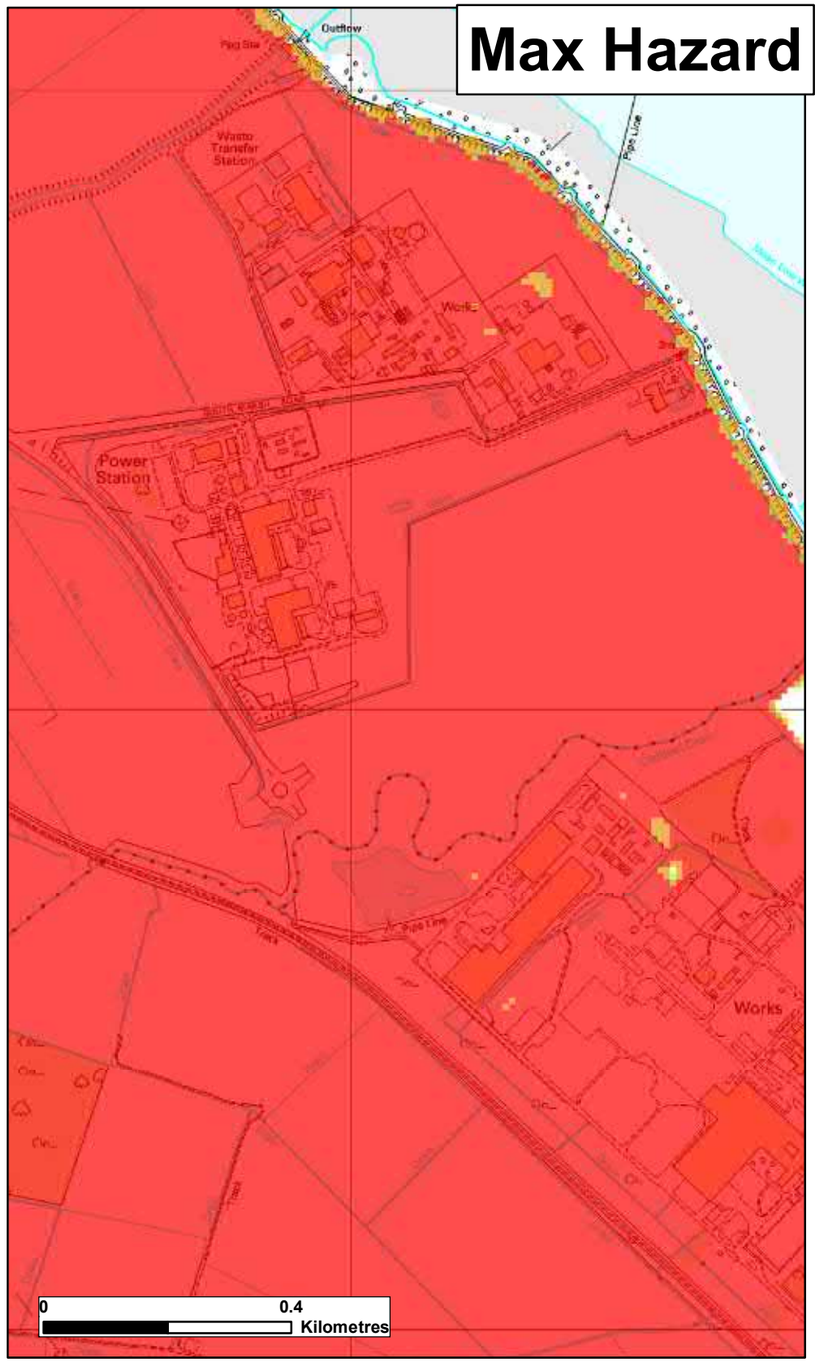

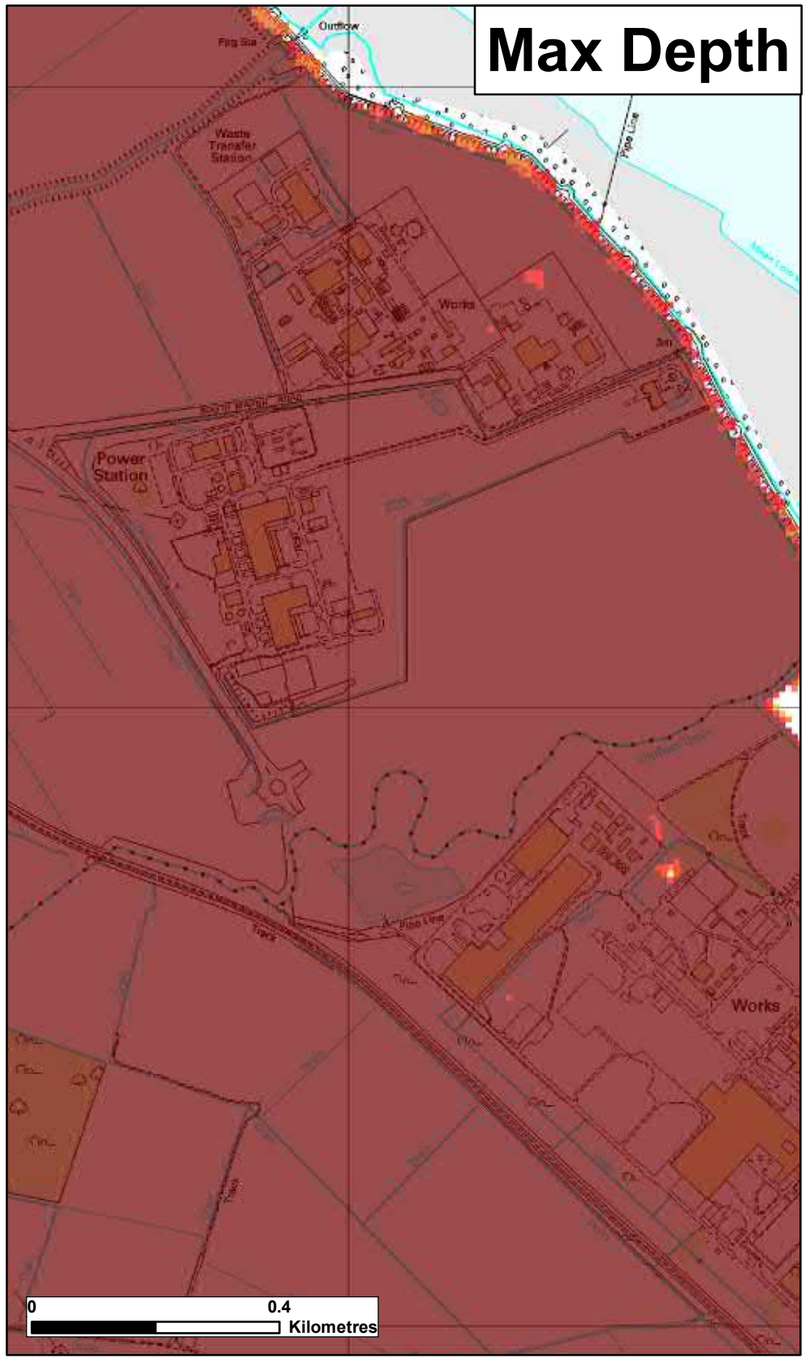

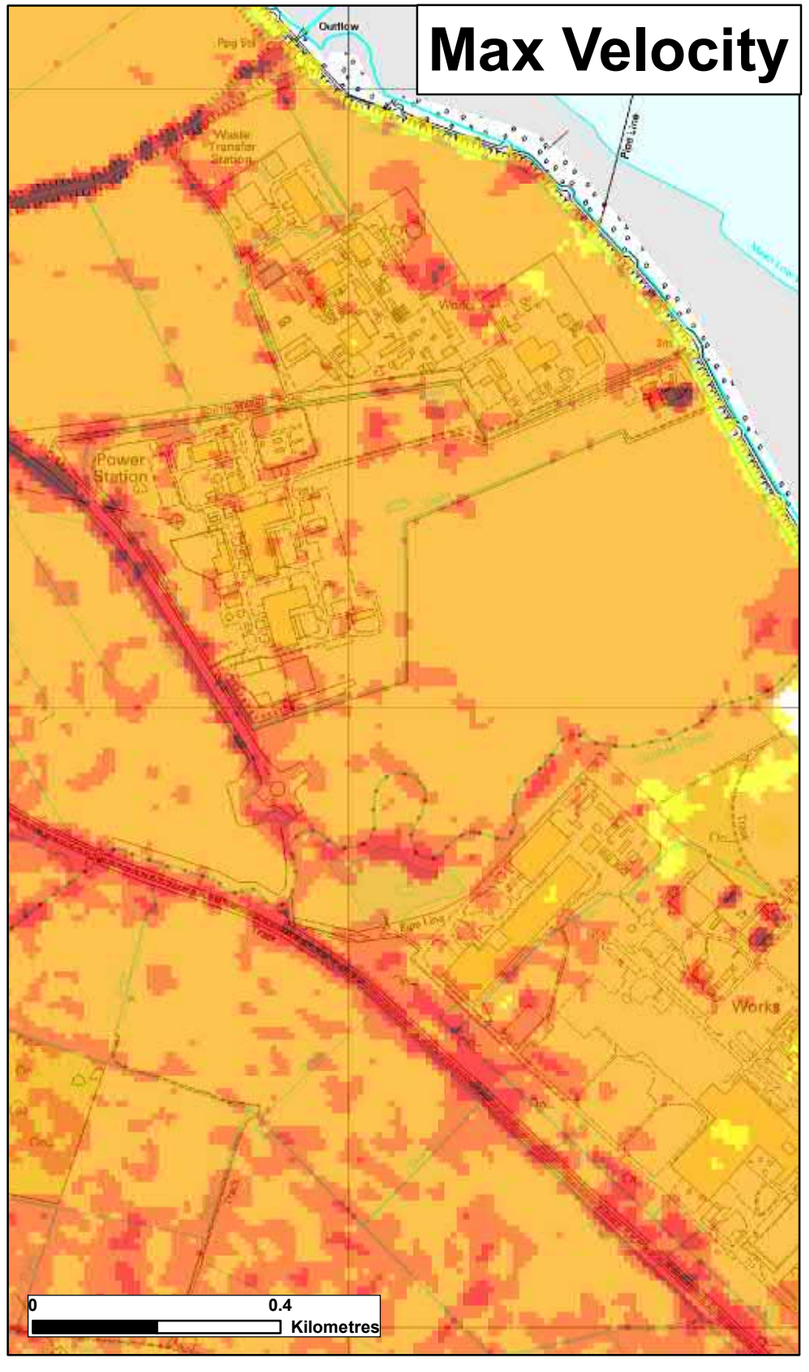

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- 2.5 +

Date Printed	June 2018	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2018-87235

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 Overtopping Hazard Mapping

Map Centred on TA 23088 13043

AECOM
2 City Walk
Leeds LS11 9AR
United Kingdom

T: +44 (0)113 391 6800
aecom.com

6 April 2020

Your Reference
EN010107

Case Manager
National Infrastructure Planning,
Planning Inspectorate

Via Email only

Application by EP Waste Management Limited, Proposed Energy Centre Development at South Humber Bank Power Station - Flood Risk Assessment

On behalf of EP Waste Management Limited in support of the above Application, AECOM acknowledges the references provided by the Planning Inspectorate in our meeting of 17 March 2020 to the recently updated Climate Change Allowances guidance (December 2019) published by the Environment Agency and the recent advice provided at acceptance stage to Flood Risk Assessment ('FRA') for a separate DCO application. This letter has been prepared by the Applicant and is signed on behalf of the Environment Agency and provides a summary of the points raised and how these have been addressed within the above Application, in consultation with the Environment Agency, as follows:

- *A site-specific FRA should take climate change into account, applying allowances for peak river flow; peak rainfall intensity; sea level rise (updated Dec 2019); and off-shore wind speed and extreme wave height (updated Dec 2019).*
- *The ES should demonstrate efficacy of proposed mitigation with reference to the future baseline.*
- *Consultation should be undertaken with Environment Agency regarding the approach to assessment including any divergence from Guidance.*

The Applicant has prepared the FRA in consultation with the Environment Agency (cc-ed into this letter) as summarised in Table 1, appended below.

The actual and residual tidal flood risk to the Site over the Proposed Development's lifetime have been assessed within the FRA, using the appropriate version of the Environment Agency's published Tidal Climate Change Allowances, which at that time, for the Humber Estuary were the UKCP09 projections[1] (**ES Volume 1, Appendix 14A, Section 4.3**), in agreement with the Environment Agency (**Section 42 Consultation on the Preliminary Environmental Information Report, 06/12/19**).

The projection data has been used to determine the minimum elevation required to protect critical infrastructure and equipment, and to provide safe refuge for personnel (+4.6 mAOD). This has been calculated based on 0.1% AEP[2] event predicted water levels behind the coastal defences, during a breach failure event for 2115, as agreed with the Environment Agency (**Consented Development EIA Scoping, 03/08/18, and Proposed Development EIA Scoping, 17/09/19**) and which is noted to be 5 times more stringent than the NPPF requirements (see Footnote 2). Mitigation for critical infrastructure protection has therefore been defined within the FRA as elevation above 4.6 mAOD, or otherwise ensuring adequate protection (**Appendix 14A, Section 6.2**); the place of safe refuge is defined as an elevated location within the administration building, which will have at least three floors and upper floors will be well above the minimum 4.6 mAOD level. (**Appendix 14A, Section 6.6**). Mitigation is proposed to be secured by a requirement in the draft DCO.

AECOM understands that to date the Environment Agency has not undertaken hydraulic modelling of the Humber Estuary Northern Area with the latest UKCP18 projection allowances for climate change up to 2125, and it is currently finalising new baseline data in respect of water levels. However, the Environment Agency has confirmed that the hydraulic modelling outputs (hazard maps) used in the FRA are still considered fit for purpose. The FRA is therefore based on the most up to date, available data. In addition it is noted that the projected tidal level for the UKCP09 epoch up to 2115 (+450 mm) with allowances for climate change, which resulted in the predicted peak

[1] 2010 Humber Estuary Northern Area Tidal Modelling
[2] Annual Exceedance Probability (0.1% equivalent to 1 in 1000 year event). The NPPF requirements are to ensure any proposed developments are built to withstand tidal flooding up to a 0.5% AEP (1 in 200 chance) event taking into account the potential impacts of climate change

water level within the Site of 4.6 mAOD defined above, is in any case well in excess of what is projected to occur by the end of the anticipated lifetime of the Proposed Development (circa 30 years) by the UKCP18 epoch up to 2065 (+339 mm) (**Appendix 14A, Section 3.2**). This demonstrates that, based on the most recent EA data available, the level of 4.6 mAOD defined in this FRA is still considered precautionary.

In agreement with the Environment Agency, it is therefore considered that the FRA to be submitted with the Application has used the latest available data. Should new baseline data become available during the course of the examination of this application this could be used to verify the FRA conclusions if this is thought to be necessary.

We trust that the above and enclosed information provides confidence that the Applicant has provided all necessary and appropriate information within the ES to enable an examination of this NSIP.

Yours sincerely,

[redacted]

[redacted]

Dr Richard Lowe
EMEA Director of Power and Industrial Consents
AECOM Limited
E: [redacted]

Annette Hewitson
Principal Planning Advisor
Environment Agency Lincs and Northampton Area
E: [redacted]

enclosures: Table 1

cc: Annette Hewitson, Environment Agency
Simon Bate, EP UKI Ltd

TABLE 1: SUMMARY OF CONSULTATION WITH THE ENVIRONMENT AGENCY

DATE	SUMMARY OF RESPONSE
Meeting to discuss scoping response 17/07/18	Consented Development: Scoping report received and Environment Agency accepted proposed approach to flood risk assessment and confirmed tidal flooding only (no fluvial flood risk). Site is defended, but the FRA must demonstrate site can remain operational, or will shut down, in event of a breach. A safe refuge would need to be provided because of tidal defence proximity. The FRA will need to demonstrate that critical infrastructure is protected (against 1 in 1000 year flood level, with climate change allowance) and that the development is safe for its lifetime.
Letter response to NELC on 03/08/2018 (EA Ref. AN/2018/127698/01-L01) and follow up telephone conversation 06/11/2018 regarding Consented Development assessment.	Consented Development: The proposed content of the EIA is considered appropriate in relation to issues within Environment Agency remit, which include assessment of water resources, flood risk and drainage.
	Advice was provided by the Environment Agency on the requirements of the FRA for the Consented Development. The FRA should consider all sources of flooding, which may include tidal, fluvial, ground water, drainage systems, reservoirs, canals and ordinary watercourses. It should demonstrate that the proposal will be safe for the lifetime of the development, without increasing risk elsewhere and where possible reducing flood risk overall. Evidence should be included that appropriate mitigation measures including flood resilience techniques have been incorporated into the development. Mitigation should include consideration of the residual risk of flooding (rapid breach of flood defences) over the lifetime of the development. The Applicant confirms that the FRA for the Consented Development considered all sources of flooding, and demonstrated that the Consented Development will be safe for its lifetime, without increasing risk elsewhere, and where possible, reducing flood risk overall.
Email responses to AECOM's request for updated data to inform the Proposed Development assessment and the FRA 30/09/2019 and 10/10/2019.	Proposed Development: The Environment Agency confirmed that there has been no change to the baseline data since the original request in June 2018. The peak flood water level for the Site from the Northern Area Tidal Modelling study was provided (having not previously been available to inform the Consented Development assessment).
	Reconfirmation of the requirement for raising critical equipment above the 2115 0.1% (1 in 1000) modelled breach level. The Applicant confirms that the assessment has been updated to refer to the peak flood water level for the Site (4.60 m Above Ordnance Datum) provided on 10/10/19. This is only 0.05 m higher than was estimated for the Consented Development FRA from the provisional data provided by the EA.
Letter response to the Planning Inspectorate dated 17/09/2019 (EA ref. AN/2019/129417/01-L01) within Appendix 2 of the EIA Scoping Opinion received 2/10/2019.	Proposed Development: The flood risk mitigation proposed for this project is likely to be in line with that agreed for the Consented Project. This included raising critical equipment above the 2115 0.1% (1 in 1000) modelled breach level, which remains our recommendation. Advice provided relating to permissions that must be obtained from the Environment Agency for any proposed activities which will take place over, on or within 8 m of a flood defence structure, culvert or Main River within the floodplain, and within 16 m of a sea defence. The Applicant confirms that no such work is included in the proposals in the vicinity of Main Rivers, culverts, river or sea defences so no additional permissions or mitigation is required.
Section 42 letter response to the Preliminary Environmental Information (PEI) Report dated 06/12/2019	The Environment Agency welcome the application of the IEMA 2011 approach as part of the assessment of the impact on the water environment, and welcomed the recommendations made in the FRA. The Environment Agency confirmed that: the FRA is appropriate to the scale nature and location of the proposed development and recommends a minimum critical level of 4.6 mAOD; and welcomed that additional mitigation strategies will be considered, including development of a Flood Emergency Response Plan through consultation with NELC and support that future occupants of the Site sign up to the Environment Agency's Floodline Warnings Direct service.

ANNEX 2: NORTH EAST LINDSEY INTERNAL DRAINAGE BOARD CONSULTATION

Burton, Helen

From:	Richard Wright [redacted]
Sent:	16 October 2018 10:36
To:	Burton, Helen
Cc:	Guy Hird; Martin Shilling
Subject:	RE: Application Number: DM/0575/18/SCO - South Humber Bank Power Station South Marsh Road Stallingborough Grimsby North East Lincolnshire DN41 8BZ

ND-4146-2018-PLN

Morning Helen,

RE: Application Number: DM/0575/18/SCO - South Humber Bank Power Station South Marsh Road Stallingborough Grimsby North East Lincolnshire DN41 8BZ

Thank you for your email of the 5th October 2018 regarding the above project, we confirm the suggested '1 in 1 Total Runoff from Existing Site' of 5l/s has been deemed acceptable.

As you have previously noted, Under the terms of the Board's Byelaws, the prior written consent of the Board is required for the introduction of any water into the District whether directly or indirectly. Additionally, the prior written consent of the Board is required for any proposed temporary or permanent works or structures in, under, over or within the byelaw distance of the top of the bank of a Board maintained watercourse.

All drainage routes through the Site should be maintained both during the works on Site and after completion of the works. Provisions should be made to ensure that upstream and downstream riparian owners and those areas that are presently served by any drainage routes passing through or adjacent to the Site are not adversely affected by the development. Drainage routes shall include all methods by which water may be transferred through the Site and shall include such systems as "ridge and furrow" and "overland flows". The effect of raising Site levels on adjacent property must be carefully considered and measures taken to negate influences must be approved by the Local Planning Authority.

Regards,

Richard Wright

Engineering Services Technician

Office: +[redacted]

Witham & Humber Internal Drainage Boards,
Witham House
J1 The Point
Weaver Road
Lincoln
LN6 3QN

www.northeastlindsey-idb.org.uk
www.witham3idb.gov.uk
www.upperwitham-idb.gov.uk
www.witham-1st-idb.gov.uk

From: Burton, Helen <helen.burton@aecom.com>
Sent: 05 October 2018 13:23
To: Planning and Consents <planning@witham3idb.gov.uk>
Cc: Cobb, Kirsty <kirsty.cobb@aecom.com>; Campbell, Ian <ian.campbell@aecom.com>; Nicoll, Chris <chris.nicoll@aecom.com>; Kearns, Laura <laura.kearns@aecom.com>
Subject: Application Number: DM/0575/18/SCO - South Humber Bank Power Station South Marsh Road Stallingborough Grimsby North East Lincolnshire DN41 8BZ

FAO Mr. Guy Hird
RE: Application Number: DM/0575/18/SCO - South Humber Bank Power Station South Marsh Road Stallingborough Grimsby North East Lincolnshire DN41 8BZ

Good afternoon Guy,

I have been co-ordinating production of the Flood Risk Assessment (FRA) and Outline Drainage Strategy that will be appended to the Environmental Statement for the proposed development detailed above. Thank you for your response to the EIA Scoping consultation attached. In response to this, I wish to confirm with the North East Lindsey IDB an agreement in principle to our outline approach that that the Proposed Development will include attenuation of surface water runoff on-site (SuDS) and the discharge to the local IDB land drains around the perimeter of the Site will be controlled to greenfield runoff rates, such that there will be no change to the existing situation.

The existing surface water greenfield runoff rates for the Proposed Development area within the Site (6.5Ha) as depicted in the attached plan were calculated (please note that this location plan is confidential at the pre-planning application stage, please therefore do not distribute this further). The table below details the existing runoff rates that were calculated using the ReFH2 method during the 1 in 1 annual probability (AP), 1 in 30 AP and 1 in 100 AP rainfall events including climate change using the FEH2013 rainfall profiles as recommended by the Environment Agency's latest Flood Estimation Guidelines (May 2017). It is proposed that an outfall structure from the proposed attenuation SuDS feature will be designed to limit the discharge to these rates. In principle, does this approach meet North East Lindsey IDB's requirements?

Table 1: Calculated Greenfield Surface Water Runoff Rates for the Proposed Development Area within the Site (6.5 Ha)

Rainfall Event (1 in X Annual Probability)	**Greenfield Runoff Rate (ReFH2) (l/s/Ha)**	**Total Runoff from the Existing Site (6.5 Ha) (l/s)**
1 in 1	0.5	3.2* *(5)*
1 in 30	1.2	7.8
1 in 100	1.6	10.2
1 in 100 + 50% for climate change**	2.4	15.6

*the minimum achievable discharge from outfall control structures, for example a HydroBrake, is usually 5 l/s

**as per the requirements of the EA latest climate change allowances for FRAs (February 2016)

As part of the detailed design stage for the drainage system, the exact extent of new impermeable area and the associated surface water runoff volumes from the proposed development required to be attenuated within the SuDS feature will be confirmed to maintain these rates. At that stage we will contact you and NELC again to consult

further regarding discharge consent to the local land drains around the perimeter of the Site and potential adoption of the SuDS feature respectively.

I look forward to hearing from you soon at your earliest convenience.
Many thanks.

Kind regards,
Helen Burton (BSc Hons)**,** MCIWEM, C.WEM, C.Sci, C.Env
Principal Consultant | Water, Ports & Power
[redacted]

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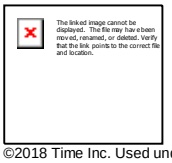

Consultee Comments for Planning Application DM/0575/18/SCO

Application Summary
Application Number: DM/0575/18/SCO
Address: South Humber Bank Power Station South Marsh Road Stallingborough Grimsby North East Lincolnshire DN41 8BZ
Proposal: Request for Scoping Opinion - Construction and operation of an energy from waste power station with a maximum gross electrical output of 49.9 MW
Case Officer: Cheryl Jarvis

Consultee Details
Name: Mr Guy Hird
Address: North East Lindsey IDB, Lincoln LN6 3QN
Email: planning@witham3idb.gov.uk
On Behalf Of: North East Lindsey Drainage Board

Comments
ND-4156-2018-PLN

Thank you for the opportunity to comment on the above application. The site is within the North East Lindsey Drainage Board area. It is within the catchment of the Board maintained Middle Drain Pumping Station.

No development should be commenced until the Local Planning Authority has approved a scheme for the provision, implementation and future maintenance of a surface water drainage system. The Board would support the use of SuDS and the drainage policies of NELC. Any discharge should be limited to the greenfield rate, however Middle Drain Pump Station was designed to allow for areas of development (to the design standard of the day). Any potential increase in discharge would be subject to the drainage system being able to convey the flows (modelling required) and a development charge payable to the Board.

Under the terms of the Land Drainage Act. 1991 the prior written consent of the Board is required for any proposed temporary or permanent works or structures within any watercourse including infilling or a diversion.

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Leeds LS11 9AR
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T: +44 (0)113 391 6800
aecom.com

28 June 2018

Our Reference
South Humber_FRA

North East Lindsey Drainage Board
Witham House,
J1 The Point,
Weaver Road,
Lincoln,
LN6 3QN

Data Consultation Request: Land at South Humber Bank, North East Lincolnshire.

Dear Sirs

AECOM has been commissioned to undertake a Flood Risk Assessment to support a planning application for a proposed 'energy related' development (currently confidential) on land adjacent to the existing South Humber Power Station site located on the South Humber Bank to the north east of Immingham.

The Site is centred on Ordnance Survey (OS) National Grid Reference (NGR) 523079, 413419 and comprises an area of circa 3 hectares (ha) of undeveloped land. A location plan is included below.

In line with the Environment Agency's standing advice, AECOM proposes to produce a Flood Risk Assessment that considers the risk to the site from all sources, rivers and the sea, streams, surface water run-off, sewers, groundwater, etc. AECOM will also make recommendations for managing surface water runoff according to sustainable drainage principles.

A review of OS 1:10k mapping indicates that there are a series of drains within the surrounding area. In order to complete the assessment, AECOM asks if North East Lindsey Drainage Board can provide the following information:

- Identify which drains/ watercourses fall under the jurisdiction of the North East Lindsey IDB;
- Confirm if any of the drains/ watercourses are regulated by pumping;
- Provision of a catchment map for the North East Lindsey IDB drains/ watercourses;
- Whether any of the drains/ watercourses have defences/ embankments;
- Any known flooding issues (historical flood levels, extents data, flood maps);
- Easements required relating to drains/ watercourses maintained by North East Lindsey IDB;
- Indication of acceptable discharge rates of surface water to the drains; and
- Any other information that is relevant or should be considered in the FRA (predicted climate change impacts etc.).

AECOM also require the following information:

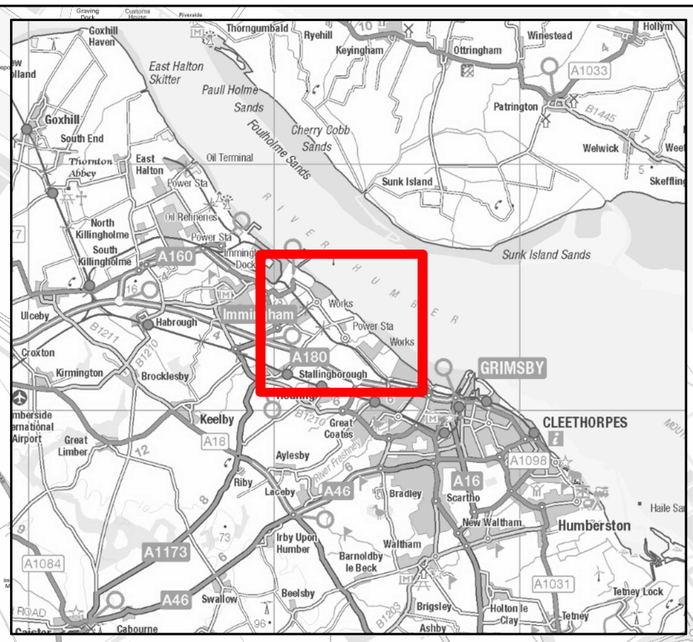
- Details of surface water and/ or groundwater abstractions in the area local to the Site;
- Details of any pollutant incidents.

I look forward to hearing from you.

Yours sincerely,

Jo Somerton
Principal Flood Risk Consultant
AECOM Limited
[redacted]

Project Management Initials: IC Designer: HW Checked: LK Approved: IC



AECOM

PROJECT

South Humber Bank Energy Centre

CLIENT

EP UK Investments Ltd

Legend

Proposed Development Site Location

Purpose Of Issue

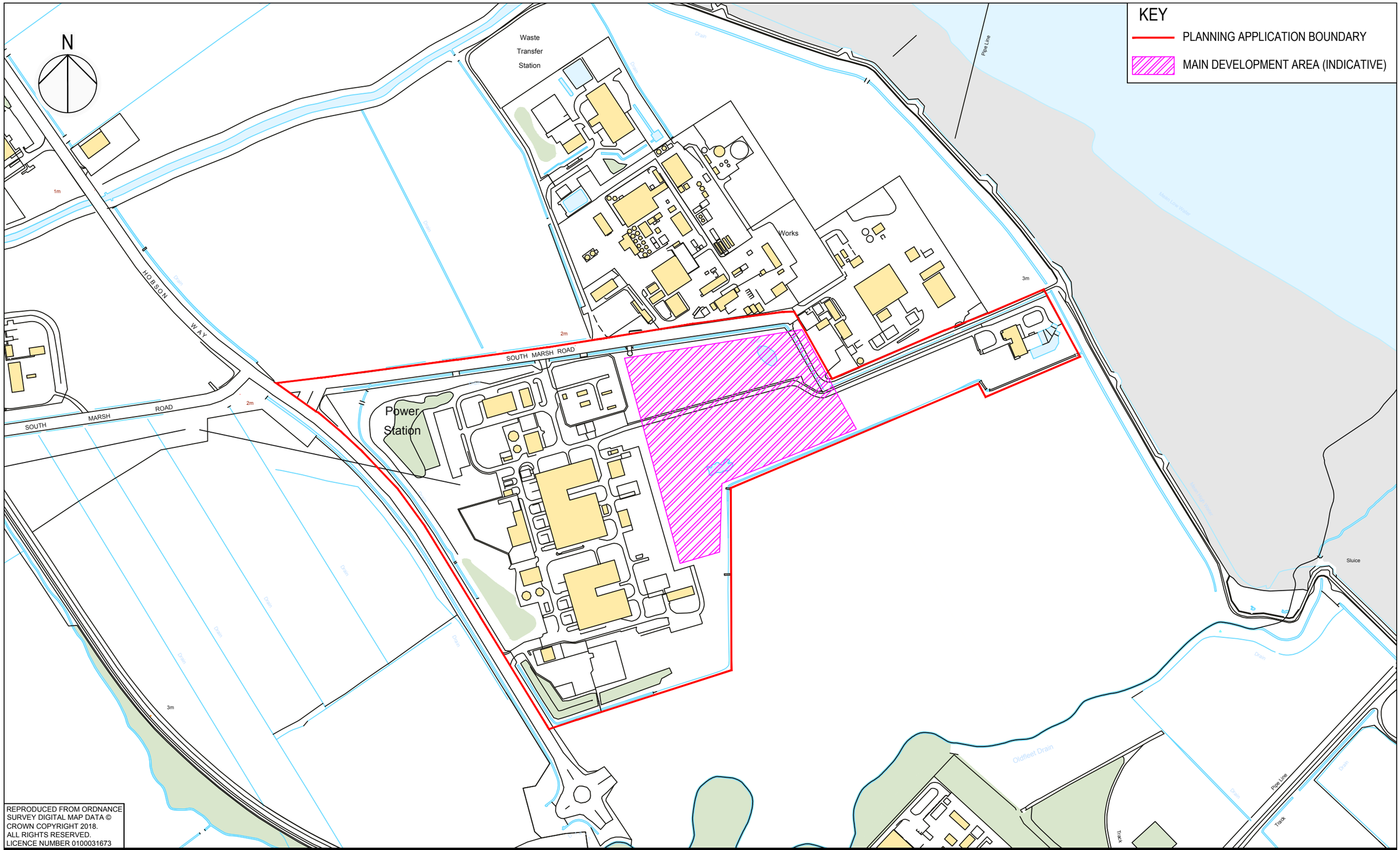
EIA Scoping

SHEET TITLE

Site Location Plan

FIGURE NUMBER

FIGURE 1



Project Title: SOUTH HUMBER BANK ENERGY CENTER	Drawing Title: PLANNING APPLICATION BOUNDARY	Purpose of issue				
		Designed: -	Drawn: AAO	Checked: IC	Approved: IC	Date: 06/18
Client: EP UK INVESTMENTS LTD		AECOM Internal Project No.: 60577705		Suitability: -		
		Scale @ A3: 1:5,000		Zone / Mileage: -		

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Drawing Number	Rev
FIGURE 2	-

ANNEX 3: NORTH EAST LINCOLNSHIRE COUNCIL CONSULTATION

Consultee Comments for Planning Application DM/0575/18/SCO

Application Summary
Application Number: DM/0575/18/SCO
Address: South Humber Bank Power Station South Marsh Road Stallingborough Grimsby North East Lincolnshire DN41 8BZ
Proposal: Request for Scoping Opinion - Construction and operation of an energy from waste power station with a maximum gross electrical output of 49.9 MW
Case Officer: Cheryl Jarvis

Consultee Details
Name: Mr Dan Harrison
Address: Origin Two, 2 Origin Way, Healing Grimsby, North East Lincolnshire DN37 9TZ
Email: daniel.harrison@nelincs.gov.uk
On Behalf Of: Drainage

Comments
This development will require sustainable surface water drainage techniques to be used.

D04 Provision of Drainage - Surface Water

No development approved by this permission shall be commenced until a scheme for the provision of surface water drainage works has been approved in writing by the Local Planning Authority. Such scheme shall be implemented to the satisfaction of the Local Planning Authority.

Reason: To prevent the increased risk of flooding by ensuring the provision of a satisfactory means of surface water disposal.

AECOM Limited
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Leeds LS11 9AR
United Kingdom

T: +44 (0)113 391 6800
aecom.com

28 June 2018

Our Reference
South Humber_FRA

North East Lincolnshire Council,
Municipal Offices,
Town Hall Square,
Grimsby,
North East Lincolnshire,
DN31 1HU

Data Consultation Request: Land at South Humber Bank, North East Lincolnshire.

Dear Sirs

AECOM has been commissioned to undertake a Flood Risk Assessment to support a planning application for a proposed 'energy related' development (currently confidential) on land adjacent to the existing South Humber Power Station site located on the South Humber Bank to the north east of Immingham.

The Site is centred on Ordnance Survey (OS) National Grid Reference (NGR) 523079, 413419 and comprises an area of circa 3 hectares (ha) of undeveloped land. A location plan is included below.

In line with the Environment Agency's standing advice, AECOM proposes to produce a Flood Risk Assessment that considers the risk to the site from all sources, rivers and the sea, streams, surface water run-off, sewers, groundwater, etc. AECOM will also make recommendations for managing surface water runoff according to sustainable drainage principles.

The Site lies entirely within Flood Zone 3a, as defined by the Environment Agency's online Flood Map for Planning and North East Lincolnshire Council's Strategic Flood Risk Maps. The site is in an area that benefits from flood defences.

AECOM would like to request the following information from North East Lincolnshire Council:

- Confirmation that the proposed development would be classified as 'Essential Infrastructure' under the NPPF Flood Risk Vulnerability Classification;
- Historical records of flooding for the area in proximity to/ at the site;
- Details of any known surface water flooding problems in the area and known Critical Drainage Areas as well as any associated Local Flood Risk Zones;
- Details of any known groundwater flooding problems in the area;
- Any requirements the Council may have with regards surface water management at the proposed development;
- Any preferred SuDS techniques;
- Specific mitigation measures likely to be required by the Council for the proposed development; and
- Any further information required to be taken in to account as part of an FRA.

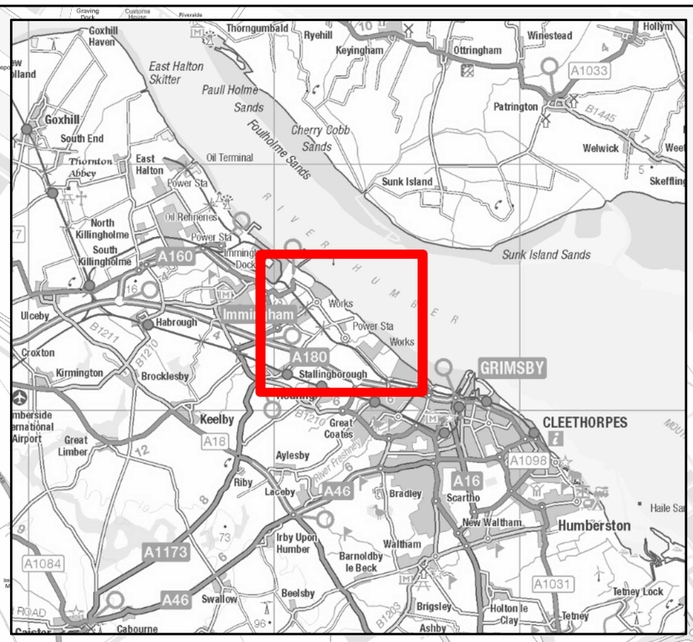
I look forward to hearing from you.

Yours sincerely,

[redacted]

Jo Somerton
Principal Flood Risk Consultant
AECOM Limited
[redacted]

Project Management Initials: IC Designer: HW Checked: LK Approved: IC



AECOM

PROJECT

South Humber Bank Energy Centre

CLIENT

EP UK Investments Ltd

Legend

Proposed Development Site Location

Purpose Of Issue

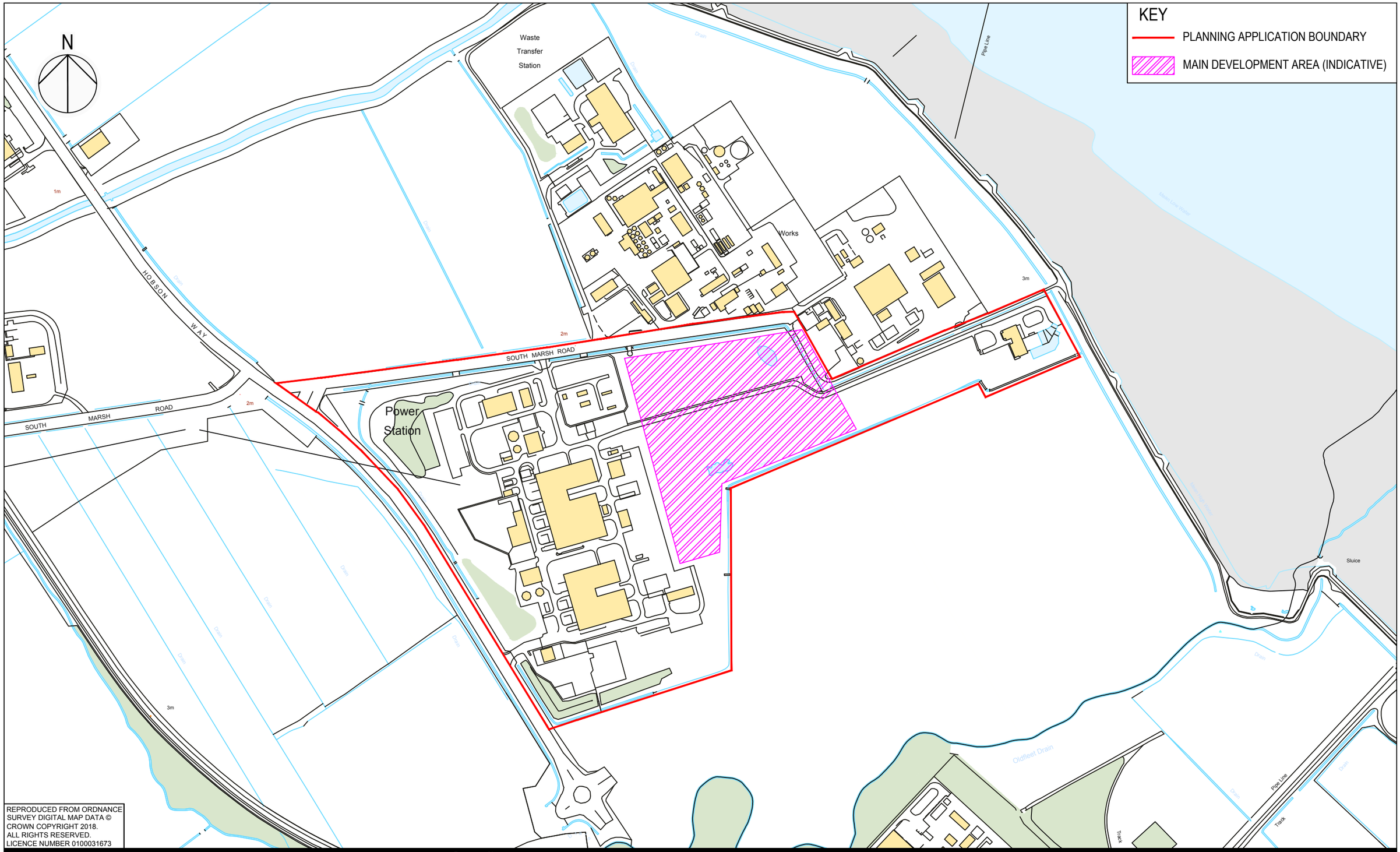
EIA Scoping

SHEET TITLE

Site Location Plan

FIGURE NUMBER

FIGURE 1



Project Title: SOUTH HUMBER BANK ENERGY CENTER	Drawing Title: PLANNING APPLICATION BOUNDARY	Purpose of issue				
		Designed: -	Drawn: AAO	Checked: IC	Approved: IC	Date: 06/18
Client: EP UK INVESTMENTS LTD		AECOM Internal Project No.: 60577705		Suitability: -		
		Scale @ A3: 1:5,000		Zone / Mileage: -		

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Drawing Number	Rev
FIGURE 2	-

Burton, Helen

From: Coastal L&N, PSO <PSO_Coastal@environment-agency.gov.uk>
Sent: 10 October 2019 15:46
To: Burton, Helen
Cc: Pearson, Katie
Subject: FW: CCN/2018/87235 - Follow up request

Hi Helen

Reference CCN-2019-144457 and CCN-2018-87235 - Follow up request

Thank you for your email. We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

Please find the sharefile link below that will enable you to download the Product 7 information for the 2010 Northern Area Tidal Modelling. I have provided the Product 7 so you can use it to manipulate both inputs and output for your desired location just in case the Product 6 wouldn't allow what you have asked for.

https://ea.sharefile.com/d-s3a150d6698e490c9

Please note this link will expire in 30 days. Please also refer to the table below with the permitted use of this information.

Name	Product 7
Description	Calibrated and Verified Model Input Data for 2010 Northern Area Tidal Modelling
Licence	Environment Agency Conditional Licence
Conditions	1.0 You may use the Information for your internal or personal purposes and may only sublicense others to use it if you do so under a written licence which includes the terms of these conditions and the agreement and in particular may not allow any period of use longer than the period licensed to you. 2.0 Notwithstanding the fact that the standard wording of the Environment Agency Conditional Licence indicates that it is perpetual, this Licence has a limited duration of 5 years at the end of which it will terminate automatically without notice. 3.0 We have restricted use of the Information as a result of legal restrictions placed upon us to protect the rights or confidentialities of others. In this instance it is because of third party data. If you contact us in writing (this includes email) we will, as far as confidentiality rules allow, provide you with details including, if available, how you might seek permission from a third party to extend your use rights. 4.1 The Information may contain some data that we believe is within the definition of "personal data" under the Data Protection Act 1998 but we consider that we will not be in breach of the Act if we disclose it to you with conditions set out in this condition and the conditions above. This personal data comprises names of individuals or commentary relating to property that may be owned by an individual or commentary relating to the activities of an individual.

	4.2 Under the Act a person who holds and uses or passes to others personal data is responsible for any compliance with the Act and so we have no option but to warn you that this means you have responsibility to check that you are compliant with the Act in respect of this personal data. 5.0 The location of public water supply abstraction sources must not be published to a resolution more detailed than 1km2. Information about the operation of flood assets should not be published.. 6.1 Where we have supplied model data which may include model inputs or outputs you agree to supply to the Environment Agency copies of any assessments/studies and related outputs, modifications or derivatives created pursuant to the supply to you of the Information, all of which are hereinafter referred to as "the Data". 6.2 You agree, in the public interest to grant to the Environment Agency a perpetual royalty free non-exclusive licence to use the Data or any part thereof for its internal purposes or to use it in any way as part of Environment Agency derivative products which it supplies free of charge to others such as incorporation into the Environment Agency's Open Data mapping products.
Information Warnings	N/A
Attribution	Contains Environment Agency information © Environment Agency and/or database rights.

Kind Regards

Dale Andrew MSc
Flood Risk Officer
South Humber and East Coast Partnerships and Strategic Overview Team

Environment Agency | Ceres House, Searby Road, Lincoln, LN2 4DW
Lincolnshire and Northamptonshire Area

[redacted]

www.gov.uk/environment-agency
www.gov.uk/floodsdestroy

From: Burton, Helen
Sent: 30 September 2019 17:01
To: LNenquiries@environment-agency.gov.uk
Cc: [redacted]
Subject: RE: CCN/2018/87235 - Follow up request

Good afternoon,

Following the earlier email correspondence below and attached, please may I re-request the missing flood risk data we require as part of a Product 6 (Model Output Data) request for a proposed development site at the South Humber Bank near Stallingborough, North East Lincolnshire to inform our Flood Risk Assessment for the site?

In addition to the maximum tidal defence breach flood water depth information (in meters (m)) provided so far in illustrated map format, we need the maximum tidal defence breach flood ***water level outputs (in meters above ordnance datum (mAOD)*** from the June 2018 hydraulic model 2D results grid in the vicinity of the same area contained within the attached GIS layer (see 'Site Location Plan & LiDAR.zip').

We need these results for the 0.5% annual probability (1 in 200 year) and 0.1% annual probability (1 in 1000 year) tidal defence breach events for both the current 2006 scenario, and for the 2115 scenario inclusive of climate change, ideally as an ASCII layer (*.asc) or a series of grid spot points with XYZ data (easting, northing, elevation) in Excel or Shapefile GIS format.

Due to the time passed since our original request for this data (03-09-2018), it is now an urgent requirement for us to be able to submit revised documentation to discharge conditions for planning approvals. Please therefore can this be provided at your earliest convenience (by the end of this week, 4th October)?

Please give me a call at the number below if you have any questions.

Many thanks.

Kind regards,
Helen Burton (BSc Hons)**,** MCIWEM, C.WEM, C.Sci, C.Env
Principal Consultant | Water, Ports & Power
[redacted]

AECOM
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From: Coastal L&N, PSO <PSO_Coastal@environment-agency.gov.uk>
Sent: 30 September 2019 09:43
To: Pearson, Katie <katie.pearson@aecom.com>
Cc: Burton, Helen [redacted]
Subject: RE: CCN/2018/87235 - Follow up request

Hi Katie

Thanks for your email. I can confirm there has been no changes to the baseline data since your original request in June 2018. Therefore, the product information you have is still considered best available data.

From reading the correspondence it looks like your additional request for modelling data, is like you mentioned a Product 6. If this is the case it will need to be requested through our customer & engagement team (LNenquiries@environment-agency.gov.uk) who will allocate it new reference number. If this is not the information you require, please feel free to get in touch and we can discuss this further.

Kind Regards

Dale Andrew MSc
Flood Risk Officer
South Humber and East Coast Partnerships and Strategic Overview Team

Environment Agency | Ceres House, Searby Road, Lincoln, LN2 4DW
Lincolnshire and Northamptonshire Area

[redacted]

www.gov.uk/environment-agency
www.gov.uk/floodsdestroy

From: Pearson, Katie [redacted]
Sent: 30 September 2019 08:35
To: Coastal L&N, PSO <PSO_Coastal@environment-agency.gov.uk>
Cc: Burton, Helen [redacted]
Subject: CCN/2018/87235 - Follow up request

Hello,

We have previously requested data via your team for a FRA we're producing for a site on the South Humber Bank, near Stallingborough, North-East Lincolnshire. For reference, I have attached copies of previous correspondence.

There have been some minor modifications to the scheme we have been working on and we are updating previously prepared planning documents, including the FRA. Therefore, we are writing to request a refresh of the baseline data previously provided in June 2018.

If there have been any changes to the baseline information (including modelling) provided in June 2018, please can you provide us with an updated response, or confirm that the information provided in June 2018 is still the best available information.

Additionally, my colleague Helen had been liaising with Rob Eames (November 2018) abut some modelling data that we requested for the FRA (correspondence also attached). Is it now possible to provide that data for our use in updating the FRA?

If you have any queries in relation to this request, please contact Helen Burton or myself at AECOM. I've copied in Annette Hewitson for info as I believe she is leading the EA consultation for this scheme.

Thanks,
Katie

Katie Pearson, BSc, MCIWEM, CWEM, CEnv,
Technical Head – Hydraulic Modelling
Water, Ports & Power
[redacted]

From 2 Jan, my normal working hours are Monday -Thursday 8am – 5pm.

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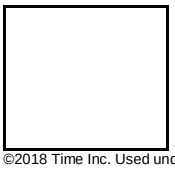

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Burton, Helen

From: Eames, Rob <Rob.Eames@environment-agency.gov.uk>
Sent: 12 November 2018 18:16
To: Burton, Helen
Cc: Kearns, Laura; Farr, Nicola; Cobb, Kirsty
Subject: RE: Proposed Energy Centre Development at South Humber Bank Power Station

Hello Helen

I'm sorry for taking so long to get you a response on this. Since the meeting I've been politely chasing to see if the modelling team would be able to action the request. Unfortunately I still haven't been able to get a firm response so I'm afraid I'll have to say I am unable to provide the information you are after.

If there is any other way I can be of assistance then please let me know. I appreciate you were after the data to enable you to determine the flood depth in mAOD so if you want to discuss a proposed level before you submit the application then please let me know.

Apologies again

Rob

Robert Eames
Partnerships and Strategic Overview Officer, Lincolnshire and Northamptonshire Area
Environment Agency | Ceres House, 2 Searby Road, Lincoln, LN2 4DW
[redacted]
+44 (0) 2084 749436

www.gov.uk/floodsdestroy

From: Burton, Helen [mailto:helen.burton@aecom.com]
Sent: 12 November 2018 17:45
To: Eames, Rob [redacted]
Cc: Kearns, Laura [redacted] Farr, Nicola < [redacted] Cobb, Kirsty [redacted]
Subject: RE: Proposed Energy Centre Development at South Humber Bank Power Station
Importance: High

Good afternoon Rob,

I hope you are well.

In understand you attended a telecon last week (6th November, 9am) with my colleagues Laura Kearns and Kirsty Cobb. They mentioned you were going to further chase your internal Flood Modelling/Mapping team for the Humber breach model maximum water level information that I requested a while ago below.

Have they managed to respond to your query yet at all? We now urgently need to submit our final reports ready for planning submission on the 21st November. I therefore cannot complete the Flood Risk Assessment on time for review by the client unless we receive this information in the next couple of days.
Do you think it is at all possible that they will be able to provide it in that timeframe?

Many thanks.

Kind regards,
Helen Burton BSc (Hons), MCIWEM, C.WEM, CSci, CEnv
Principal Consultant | Water, Ports & Power | AECOM
[redacted]

From: Burton, Helen
Sent: 06 September 2018 12:04
To: Eames, Rob [redacted]
Cc: Kearns, Laura [redacted] Metcalfe, Phil [redacted] Bolton, Alannah [redacted] Campbell, Ian < [redacted]
Subject: RE: Proposed Energy Centre Development at South Humber Bank Power Station

Good morning Rob,

Many thanks for providing the additional information and maps below. The difficulty with providing only depth bands in meters (m) is that if we apply those above varying LiDAR ground levels (GL), we cannot accurately define a consistent minimum level in meters Above Ordnance Datum (mAOD) above which the critical equipment and designated place of refuge at the site should be elevated to be considered safe in the unlikely event of a defence breach.

For example, see data for the 5 locations highlighted below. If I compare the EA 1m LiDAR against the 0.1% AEP to 2115 depth bands provided, this results in a large range in potential water levels (WL) (approx. 800 mm). I understand that the peak water level may vary slightly across a large area where the land exhibits a gradient, but the wider area is relatively flat so we would not expect such a large variance in ponded WLs behind defences. Even if we include a freeboard to account for the uncertainty (usually up to 300 mm requested by the EA), it leaves it widely open to interpretation as to which value to choose to apply that to, and being overly conservative may significantly increase costs to the developer.

ID	Breach_Max_Depth_m_1000YRCC	EA_LiDAR_1m_GL_mAOD	Estimated_Min_WL_mAOD	Estimated_Max_WL_mA
1	2.0 - 2.25	2.16085	4.16	4
2	2.5 - 2.75	1.9022	4.40	4
3	1.0 - 1.25	3.709	4.71	4
4	2.0 - 2.25	2.48981	4.49	4
5	1.75 - 2.0	2.6186	4.37	4

It is my understanding that any hydraulic model that produces an ASCII grid of depth results across the flood extent should also produce an ASCII grid of coincident WL/stage results in mAOD units, as it is from that which the model calculated the depths from above the ground terrain model that was used in the model geometry. If the EA do possess the breach model output ASCII grids with mAOD units, would it be possible for these to be provided across the site and local vicinity either in ASCII format via your 'Sharefile' facility, or in a plan illustrating the WLs in a grid of spot points across the site? From this we are intending to identify the highest WL in the areas proposed for development above which to recommend the equipment/safe place of refuge are elevated above. We usually receive this sort of information from other EA areas as part of a Product 6/8 data request.

If it is not possible to provide this, would the EA be able to recommend how we reconcile the large margin of potential inaccuracy incurred from the depth bands in relation to the widely varying GLs in the site boundary (1.9 to 3.7 mAOD) to determine the necessary recommendation?

I'll be in the office until 6pm today should you wish to discuss at my number below.
Many thanks.

Kind regards,
Helen Burton BSc (Hons), MCIWEM, C.WEM, CSci, CEnv
Principal Consultant | Water, Ports & Power | AECOM
Direct: +[redacted]

From: Eames, Rob [redacted]
Sent: 05 September 2018 17:58
To: Burton, Helen
Cc: Somerton, Joanne; Kearns, Laura; Bolton, Alannah; Campbell, Ian; Farr, Nicola
Subject: RE: Proposed Energy Centre Development at South Humber Bank Power Station

Hello Helen

I'm sorry for the confusion – I mistakenly thought the CCN was the information you were waiting for. Looking back at the minutes I can see we agreed to send you more detailed information to inform you of the depths on the site.

As the modelling shows that the depths are significantly greater than the 1.6m (+) maximum banding I have attached two breach depth maps – one for the 2115 0.5% (1 in 200) scenario and one for the 2115 0.1% (1 in 1000) scenario. I have reduced the bandings to 250mm and increased the number for the upper depths to cover the depths we discussed. I can't give you a definitive answer for depth but the maps will give you an idea of what the modelling has highlighted.

Unfortunately I'm not able to easily give you depths in mAOD. The breach hazard mapping is created without specific land levels being referenced in mAOD as the accuracy of this information is subject to change. You can however reference against the latest LIDAR available here.

If you want to discuss further please feel free to give me a ring on my number below. I am in the office tomorrow (Thursday) but out on Friday.

Kind regards

Rob

Robert Eames
Partnerships and Strategic Overview Officer, Lincolnshire and Northamptonshire Area
Environment Agency | Ceres House, 2 Searby Road, Lincoln, LN2 4DW
[redacted]

www.gov.uk/floodsdestroy

From: Burton, Helen [redacted]
Sent: 03 September 2018 12:03
To: Eames, Rob <[redacted]
Cc: Somerton, Joanne [redacted] Kearns, Laura [redacted]; Bolton, Alannah <[redacted]>; Campbell, Ian [redacted]
Subject: Proposed Energy Centre Development at South Humber Bank Power Station

Good morning Rob,

I am working with Jo Somerton preparing the Flood Risk Assessment for the proposed South Humber Bank Energy Centre development north of Grimsby for which I understand you attended a meeting on the 17th July (see Environment Agency internal meeting notes that were circulated attached).

Following provision by the EA of the breach event depth maps behind the sea defences (your ref. CCN/2018/87235), I understand that the maps illustrate that the Site is potentially at a residual risk of flooding up to a depth of band of '>1.6 m', but you confirmed at the meeting that the approximate depth of would be in the

region of 2.2 to 2.4 m for the 1 in 200 to 1 in 1000 year events. It was noted in our minutes (also attached) that there was an action for you to subsequently forward us the more accurate depth information for the 1 in 200 and 1 in 1000 year events.

We are intending on specifying the level in mAOD at which the critical equipment and safe refuge area for people at the Site should be elevated above to in order to protect it from this residual risk. Therefore, would it possible for you to please send me the modelled maximum breach water levels in mAOD in the vicinity that results in these depths, rather than depth in m? According to the Table presented on page 10 of the CCN/2018/87235 PDF, I've assumed at present that the peak tide levels for these 2 events would be somewhere between 5.14 and 5.47 mAOD (interpolated been Haborough Marsh and Grimsby, but with a defence breach this may be lower once ponded behind the defences?

I've provided 2 figures to assist. Due to the length of time passed since this meeting, it would be greatly appreciated if you could provide this as at your earliest convenience to assist us in meeting the planning submission deadline.

I look forward to hearing from you.
Many thanks.

Kind regards,
Helen Burton (BSc Hons)**,** MCIWEM, C.WEM, C.Sci, C.Env
Principal Consultant | Water, Ports & Power
[redacted]

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FORTUNE WORLD'S MOST ADMIRED COMPANIES 2018

Ms Cheryl Jarvis
Development Management
Engie/North East Lincolnshire Council
1 Origin Way
Grimsby
DN37 9TZ

Our ref: AN/2018/127698/01-L01
Your ref: DM/0575/18/SCO

Date: 03 August 2018

Dear Cheryl

Request for Scoping Opinion - construction and operation of an energy from waste power station with a maximum gross electrical output of 49.9 MW
South Humber Bank Power Station, South Marsh Road, Stallingborough, Grimsby

Thank you for consulting us on to the above Scoping Opinion Request.

We have reviewed the submitted Scoping Report (ref Scoping 1.0, AECOM) and consider the proposed content of the EIA appropriate in relation to issues within our remit, which include flood risk, hydrogeology and land contamination.

Environmental permitting
Operation of the proposed power station would be subject to an environmental permit under the Environmental Permitting (England and Wales) Regulations 2016. The applicant is fully aware of this and has already met with us and received permit pre-application advice.

Any importation of recycled materials for construction purposes may require appropriate permits or exemptions.

Flood risk – advice to the applicant
The report acknowledges that a Flood Risk Assessment (FRA) based on the requirements of the National Planning Policy Framework (NPPF) should be prepared to accompany the future planning application.

The FRA should consider all sources of flooding, which may include tidal, fluvial, ground water, drainage systems, reservoirs, canals and ordinary watercourses. It should demonstrate that the proposal will be safe for the lifetime of the development, without increasing risk elsewhere and where possible reducing flood risk overall. Evidence should be included that appropriate mitigation measures including flood resilience techniques have been incorporated into the development.

Cont/d..

We note the applicant has already received a flood risk product from the Environment Agency. This includes coastal hazard mapping, which shows the consequences should a breach of the sea defences occur, including the potential flood depths, velocities and overall hazard over the lifetime of the development.

Areas behind sea 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. Our advice on mitigation measures for new development is based on the potential consequences of a breach over the lifetime of the development – the residual risk of flooding. We do not take into account the probability of defence failure, which is in line with current government guidance.

In this case we would not expect the whole of the proposed development be raised above breach flood levels. If land raising is undertaken on a large scale, we would want to see evidence in the FRA that flood risk has not been increased elsewhere.

The FRA should identify the vulnerability classification of the proposal, the expected lifetime of the development and whether or not the site needs to remain operational in a flood event.

For development defined as essential Infrastructure, all critical equipment should be located above the flood depths expected for the 0.1% (1 in 1000) scenario including climate change allowance depending on lifetime of development. The FRA should identify the types of equipment considered critical following discussion with the applicant.

To manage the safety of people at the site, an area or areas of safe refuge should be provided above the maximum potential breach flood depths and a flood warning and evacuation plan developed and agreed with the local authority.

For other buildings, plant and equipment the FRA should identify appropriate mitigation based on the business needs of the operator. This would include resistance and resilience techniques in line with ‘Improving the flood performance of new buildings: flood resilient construction’.

Should you require any additional information, or wish to discuss these matters further, please do not hesitate to contact me on the number below.

Yours sincerely

Nicola Farr
Sustainable Places - Planning Advisor

End

AECOM Limited
5th Floor, 2 City Walk
Leeds LS11 9AR
United Kingdom

T: +44 (0)113 391 6800
aecom.com

22 May 2018

Our Reference
South Humber_FRA

Environment Agency
Waterside House
Waterside North
Lincoln
LN2 5HA

Data Consultation Request: Land at South Humber Bank, North East Lincolnshire.

Dear Sirs

AECOM has been commissioned to undertake a Flood Risk Assessment to support a planning application on land located on the South Humber Bank to the north east of Immingham, Immingham. The proposed development will located within the red line boundary indicated on the attached location plan below.

In line with the Environment Agency's standing advice, AECOM proposes to produce a Flood Risk Assessment that considers the risk to the site from all sources, rivers and the sea, streams, surface water run-off, sewers, groundwater, etc. AECOM will also make recommendations for managing surface water runoff according to sustainable drainage principles.

The Site lies entirely within Flood Zone 3a, as defined by the Environment Agency's online Flood Map for Planning. AECOM therefore requests the following information to inform the FRA:

- Any detailed maps of historical flood extents for the area and details of any other flood level or flood extent data related to the area that may be relevant, including any photographs or other anecdotal information;
- Details of any flood defences for the area, their condition, anticipated lifetime and statutory flood defence levels;
- Modelled water levels for the nearest adjacent model nodes in the Humber (including the 100 year, 200 year, 200 year plus climate change and the 1000 year flood levels);
- The results of any modelling showing the inundation extents, depths and flood hazard resulting from breaching, overtopping, or spray-over of the flood defences (for both the defended and undefended scenarios);
- Details of any tidal control structures in the vicinity;
- Details of any known surface water flooding problems in the area and confirmation of any designated critical drainage areas (CDAs);
- Provision of mapping showing the areas susceptible to surface water flooding and the flood map for surface water (AStSWF and FMfSW);
- Details of groundwater levels in the area and of the risk of rising groundwater levels and provision of mapping (AStGWF); and
- Outline flood risk mitigation measure requirements for the essential infrastructure, including minimum floor levels, flood storage etc.

I look forward to hearing from you.

Yours sincerely,

[redacted]

Jo Somerton
Principal Flood Risk Consultant
AECOM Limited
[redacted]

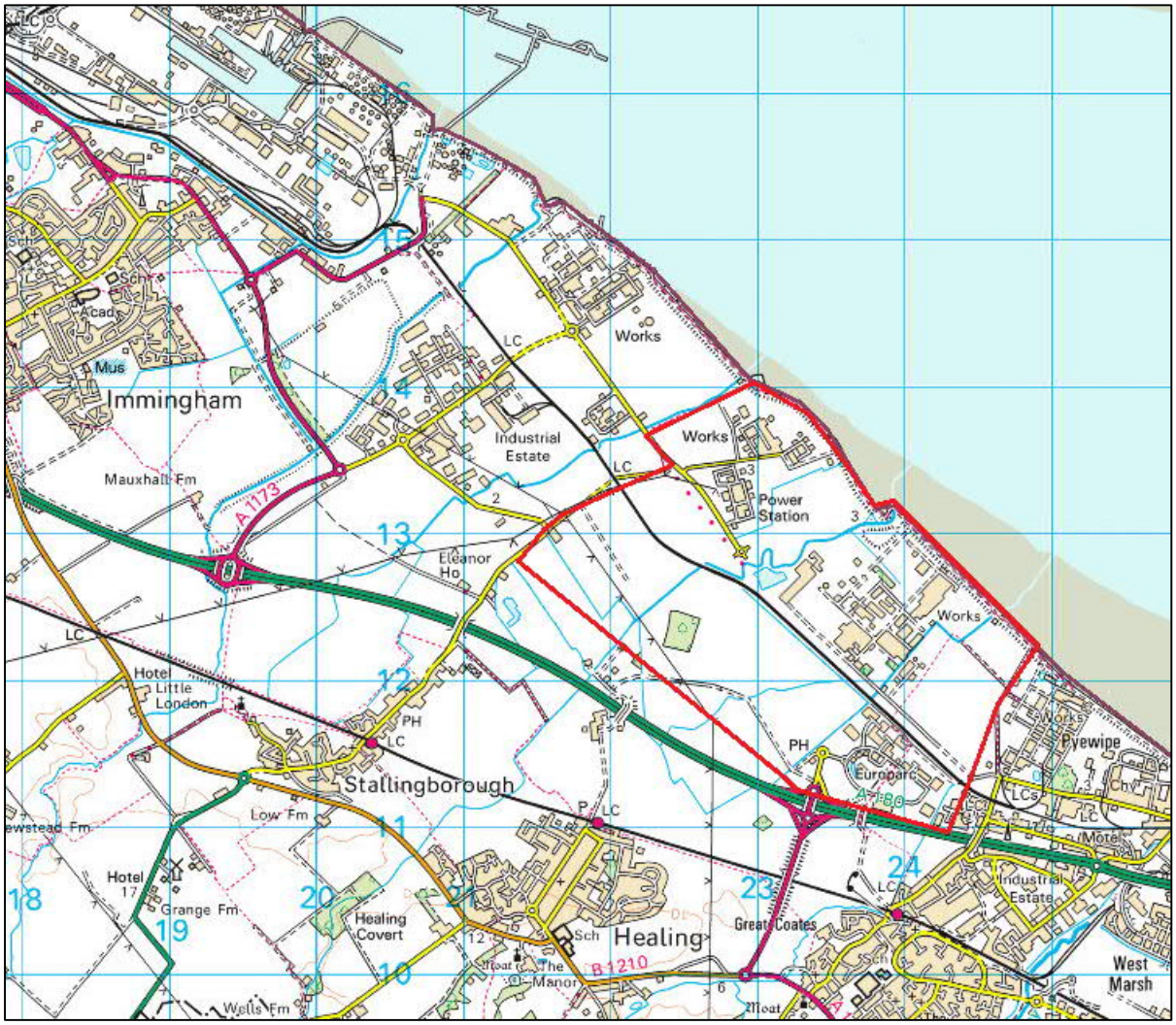

Figure 1: South Humber Bank (Development will be located within the red line boundary).

ANNEX 4: ANGLIAN WATER CONSULTATION

Anglian Water Services Ltd
Thorpewood House
Thorpewood
Peterborough
PE3 6WT

Tel 0345 0265 458
www.anglianwater.co.uk

North East Lincs District Council

Sent by email.

15 August 2018

Scoping Opinion – South Humber Bank DM-0575-18

Thank you for the opportunity to comment on the scoping report for the above development. Anglian Water is the sewerage and water undertaker for the proposed site.

Construction Phase

It is unclear at this stage what the requirement for wastewater services will be during the construction phases. Discussions with Anglian Water should take place as soon as possible to ensure this issue is considered.

Water Resources and Flood Risk

We would recommend that reference is made to the existing foul sewerage networks and sewerage treatment.

The use of sustainable drainage systems for the development is encouraged. There is information regarding SuDS available on our website via the following link: http://www.anglianwater.co.uk/developers/suds.aspx

Pre Planning

Anglian Water would encourage early engagement with the developer in order to address foul water infrastructure issues.

We provide a pre-planning service for used water to identify feasible drainage solutions. Further details of the service provided by Anglian Water is available to view at the following address: :
http://www.anglianwater.co.uk/developers/pre-planning-service-.aspx

If you wish to discuss any aspect of this response please do not hesitate to contact me.

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Cambridgeshire. PE29 6YJ
Registered in England
No. 2366656.

an AWG Company

Hannah Wilson
Pre-Development Planning Manager