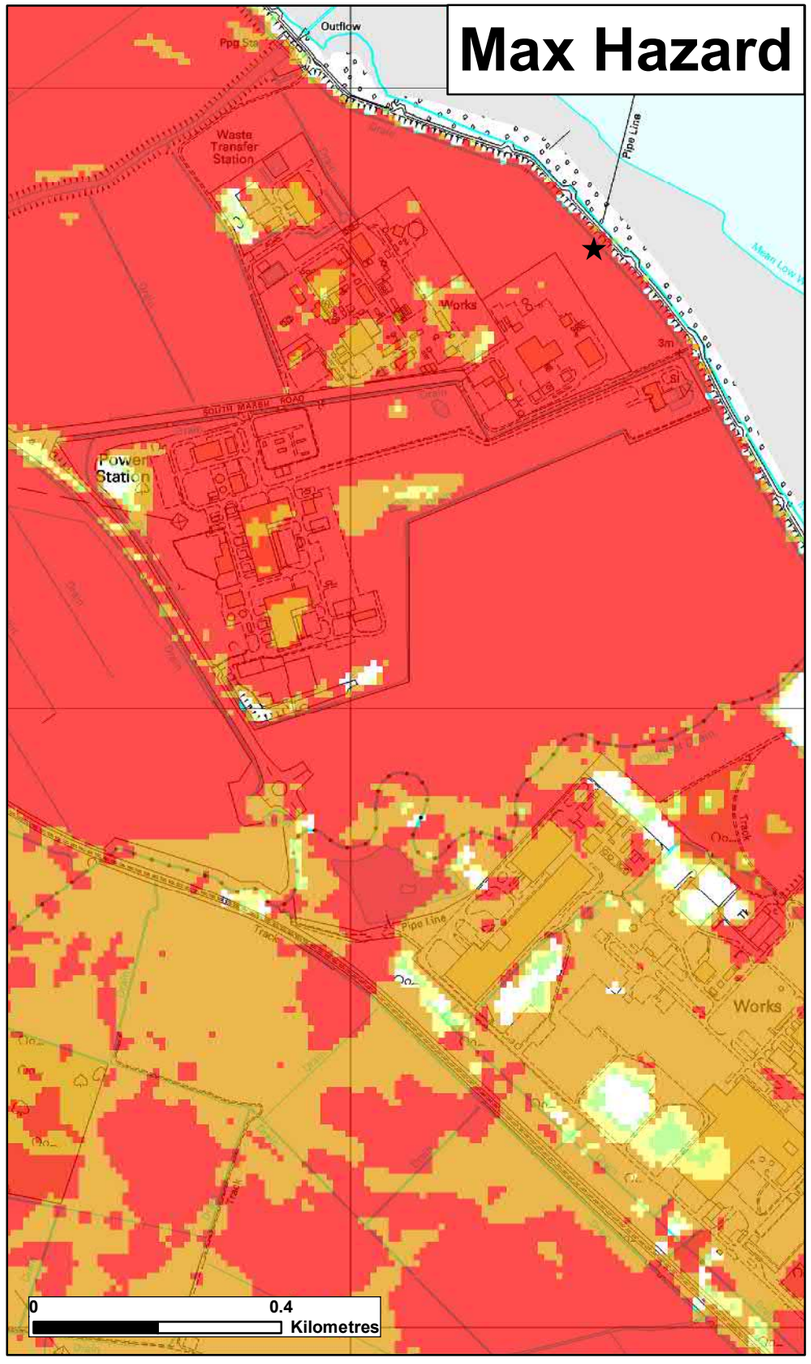

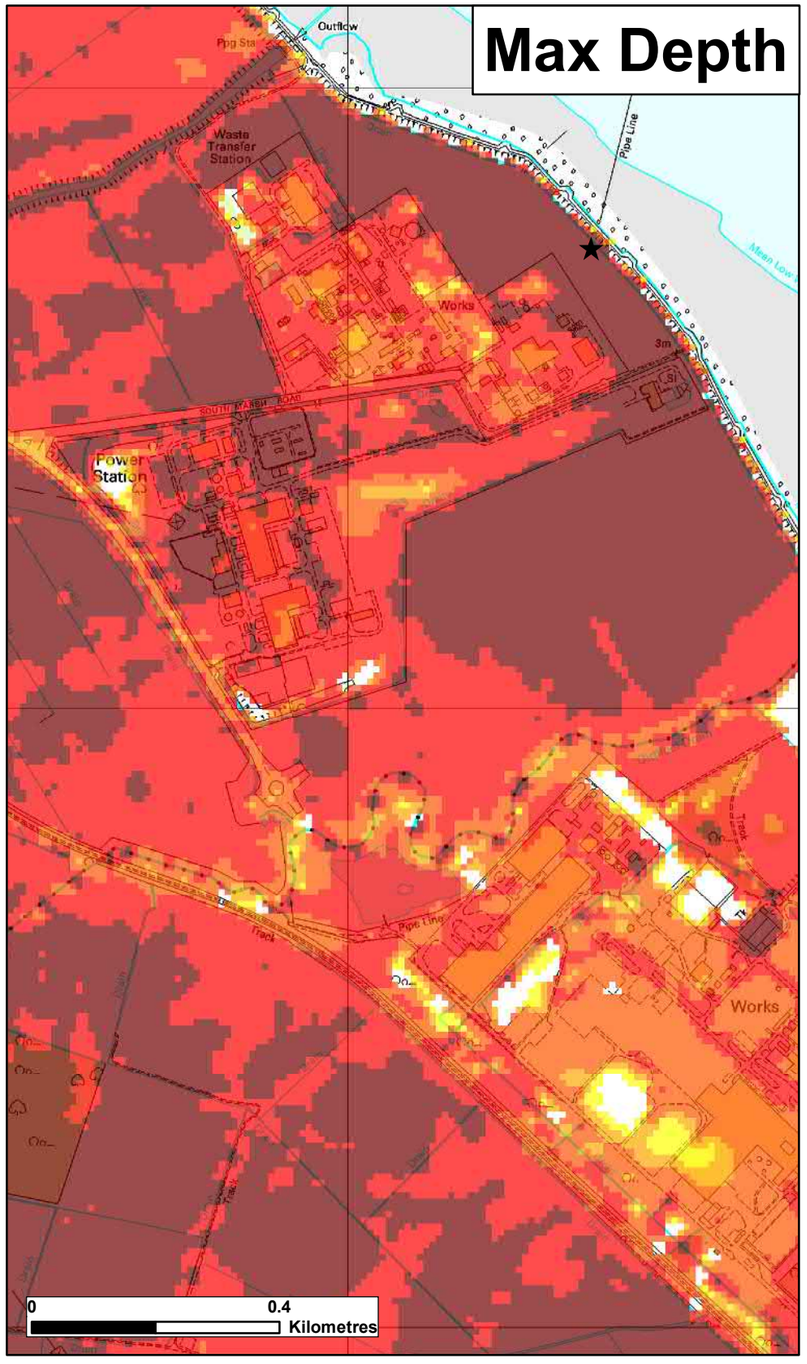

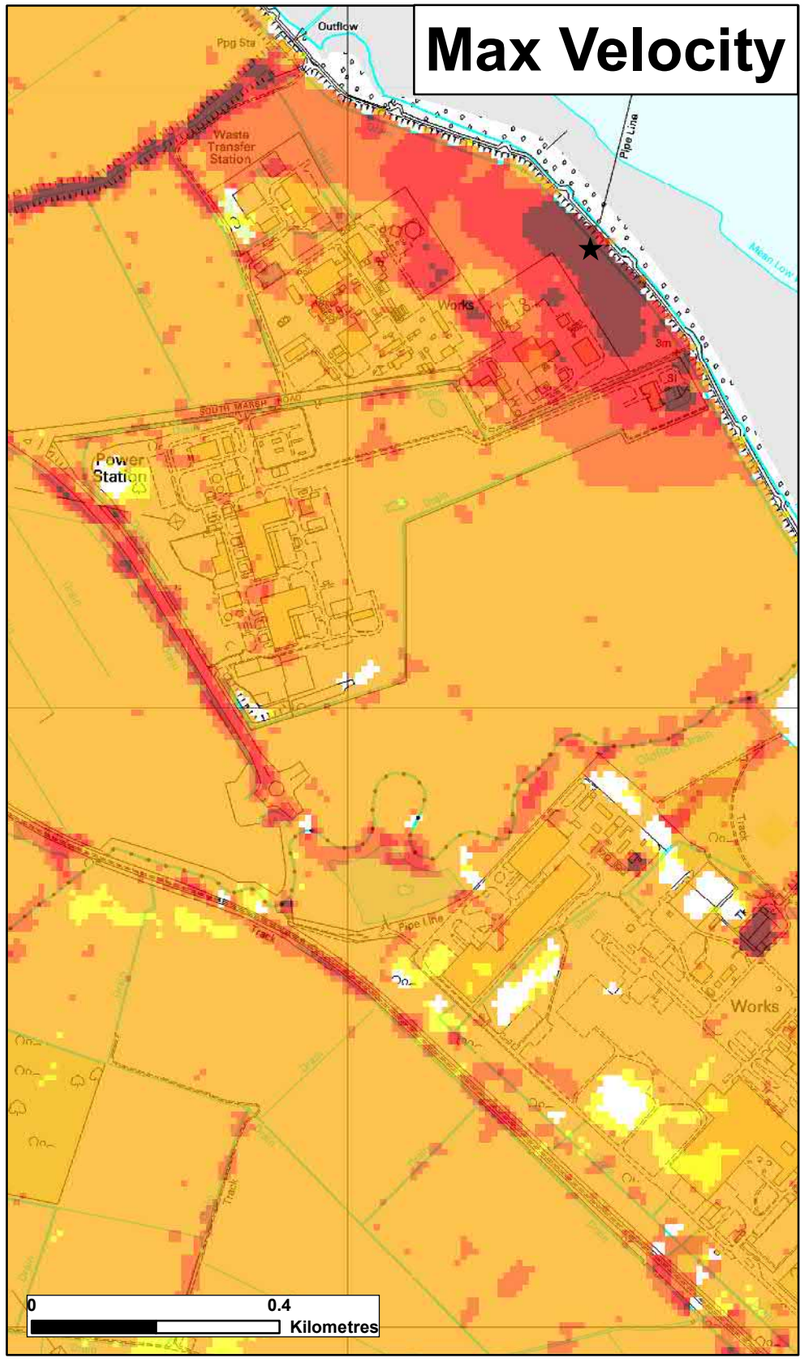

★ **Modelled Breach Locations** - see also the accompanying plan "Location of Modelled Breaches"

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

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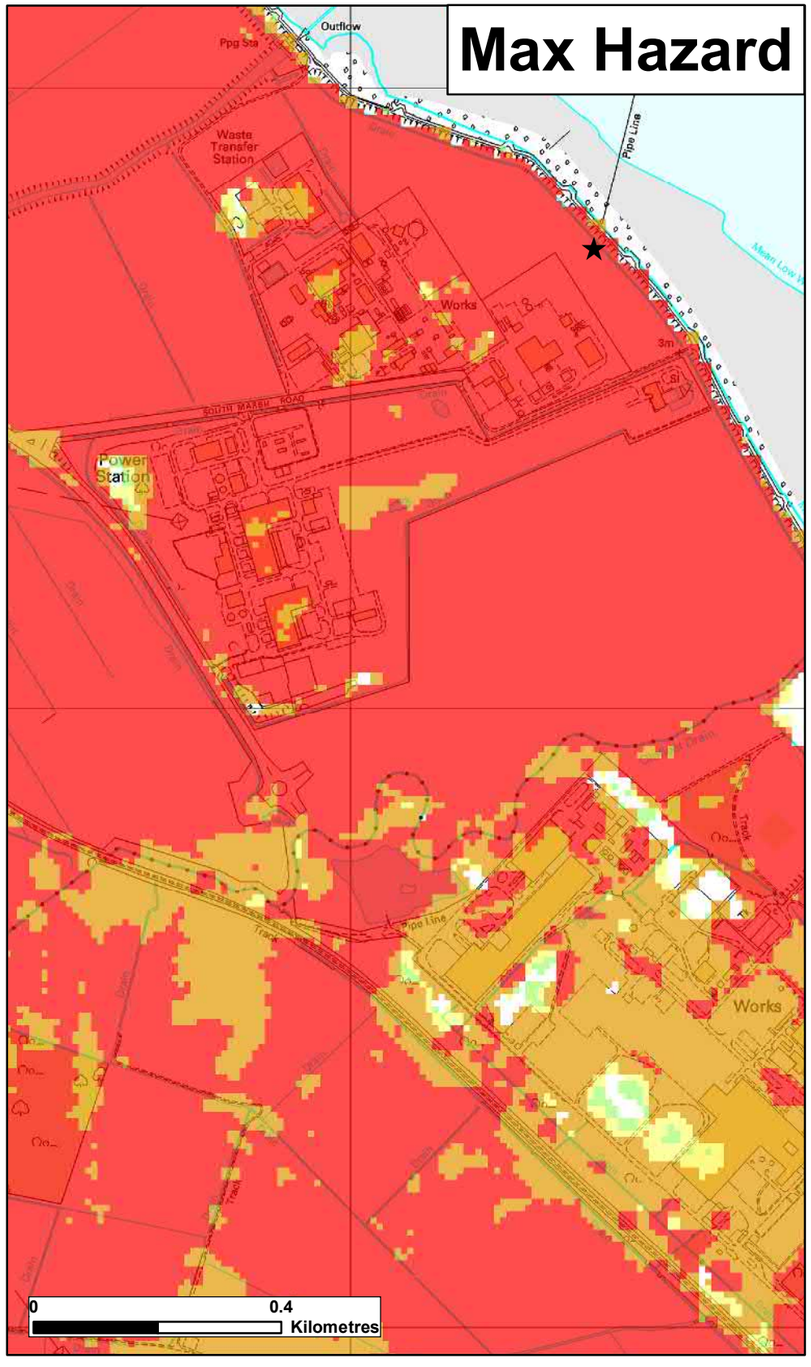
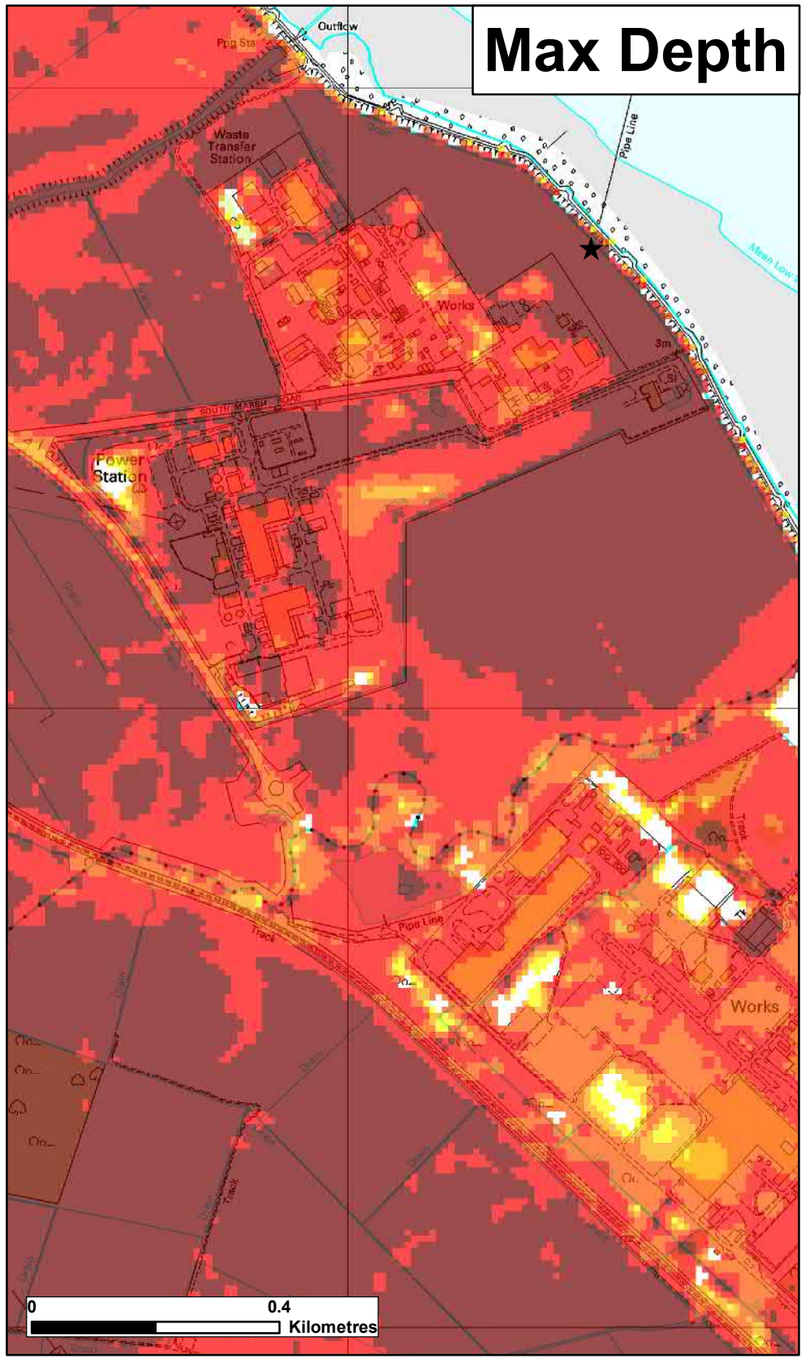
General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary

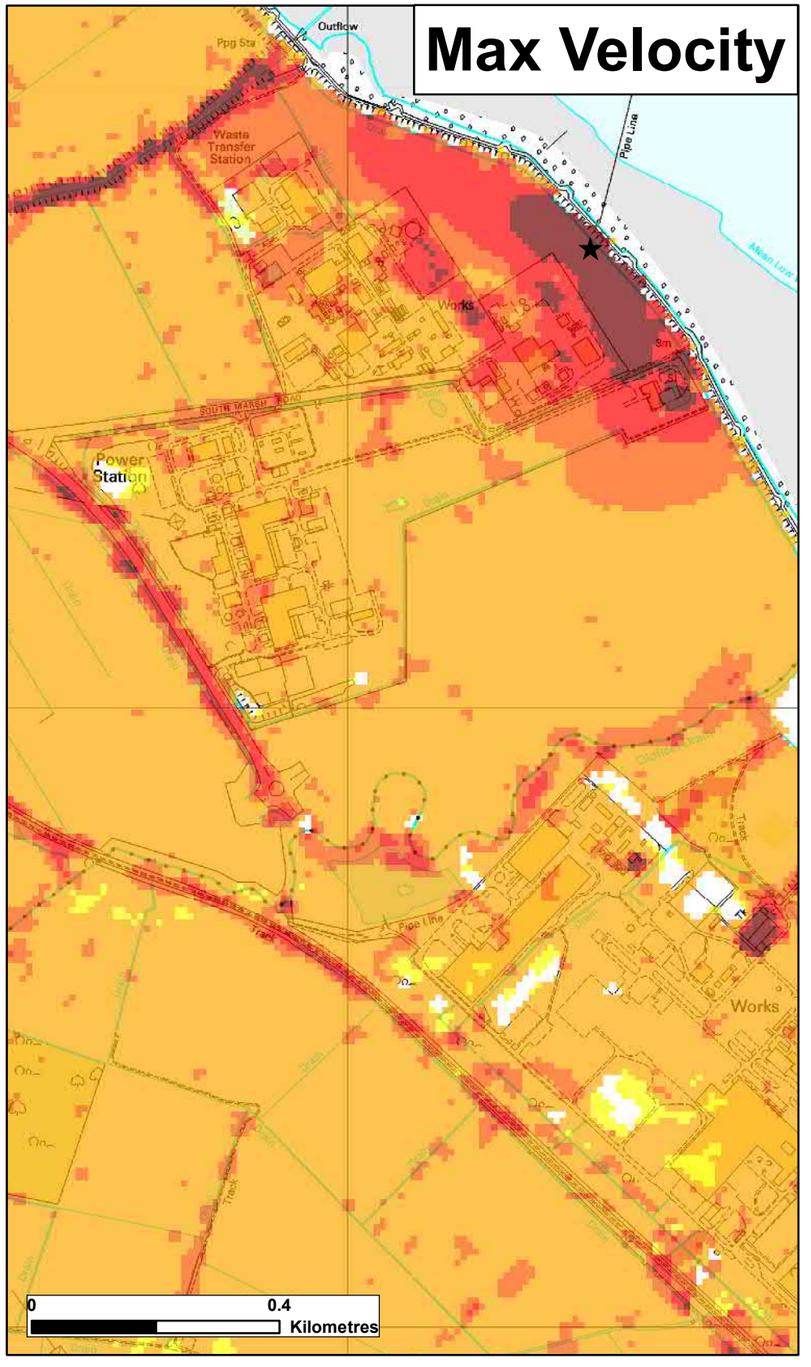
Environment Agency

Lincolnshire and Northamptonshire Breach Hazard mapping

Map Centred on TA 23088 13043







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Max Depth (m)

- 0 - 0.25
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- 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
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Date Printed	June 2018	Scenario year	2006	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2018-87235

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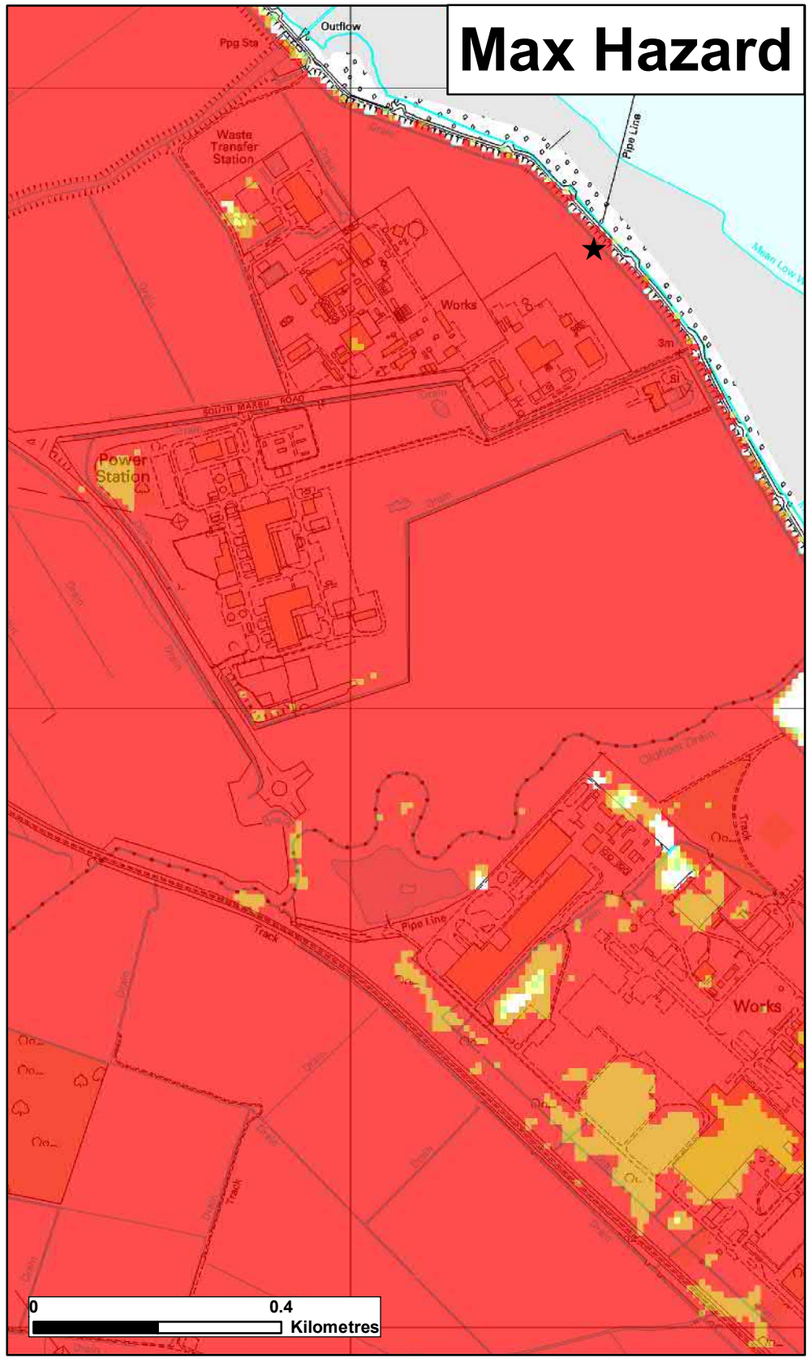

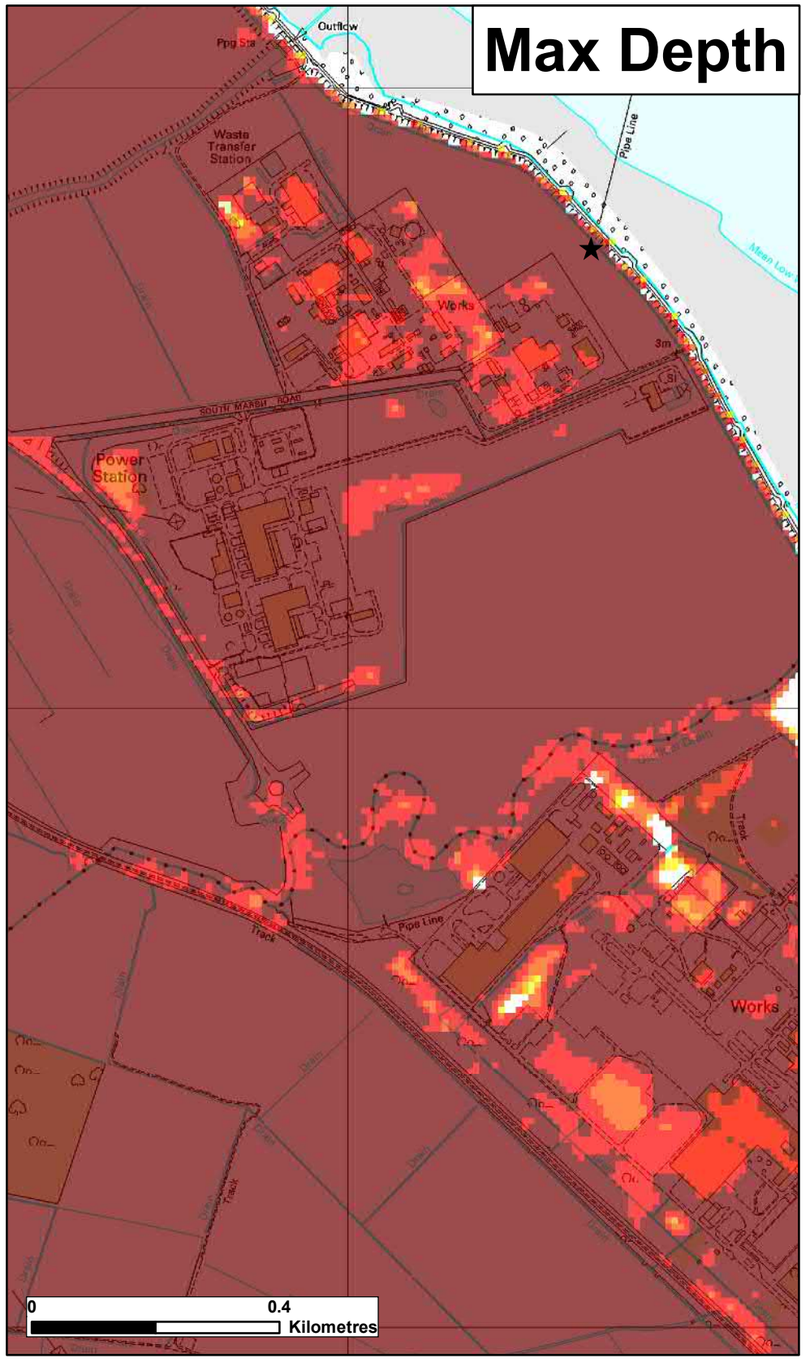

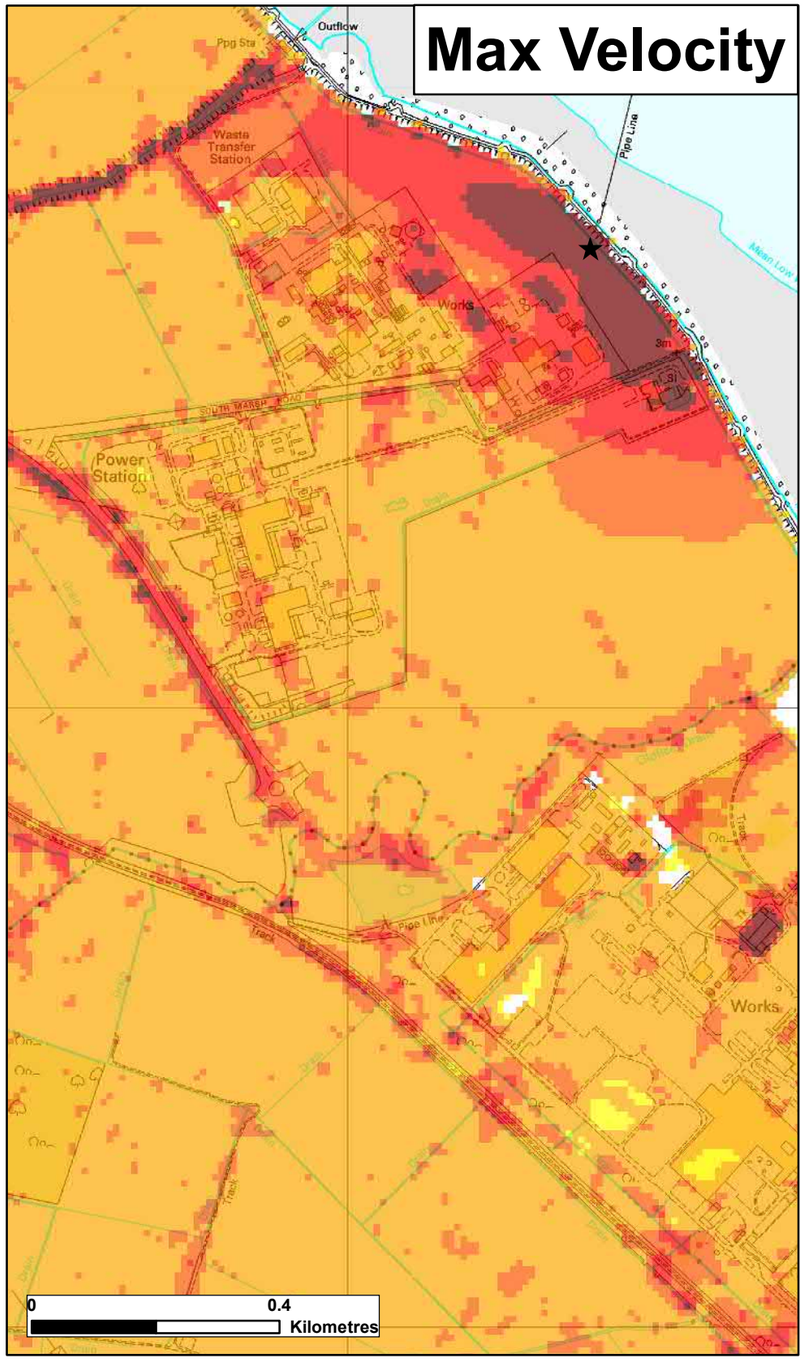

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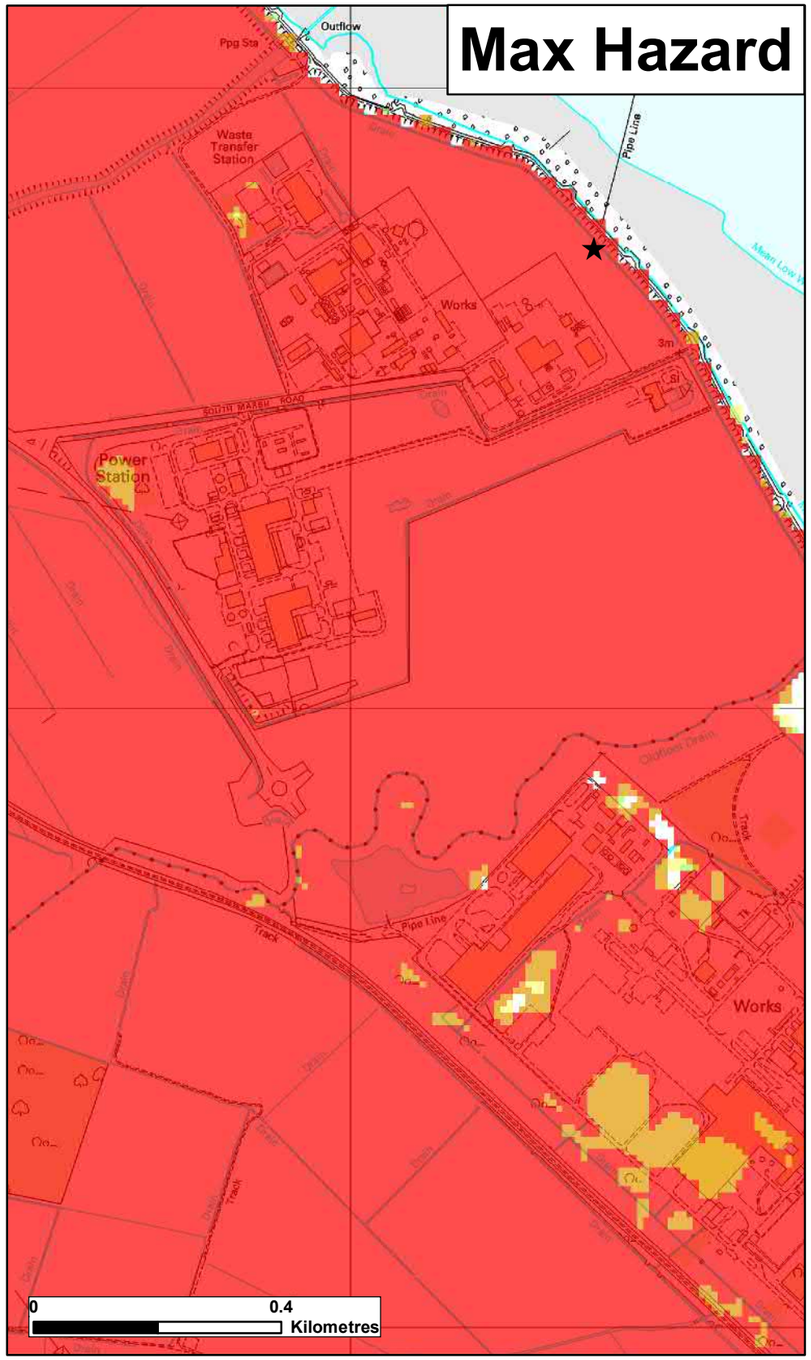

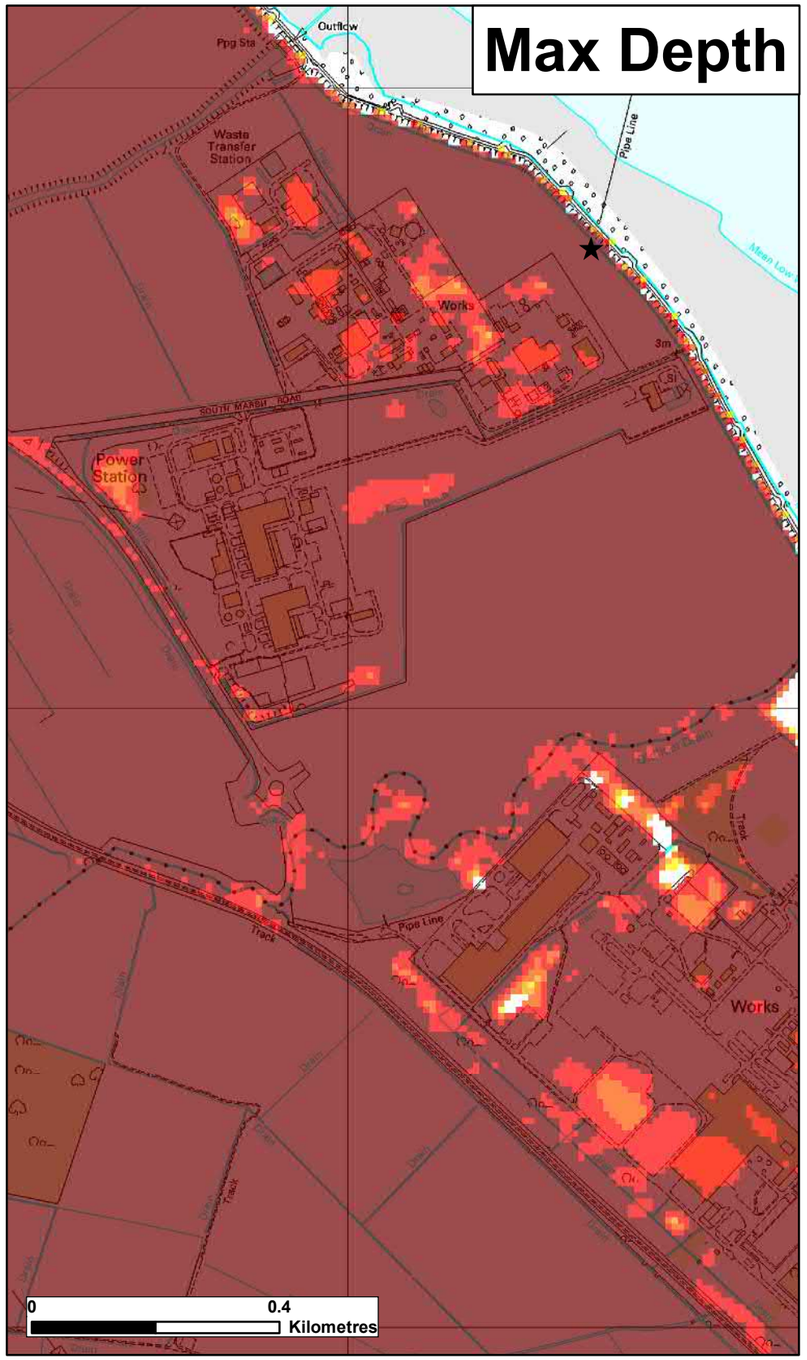

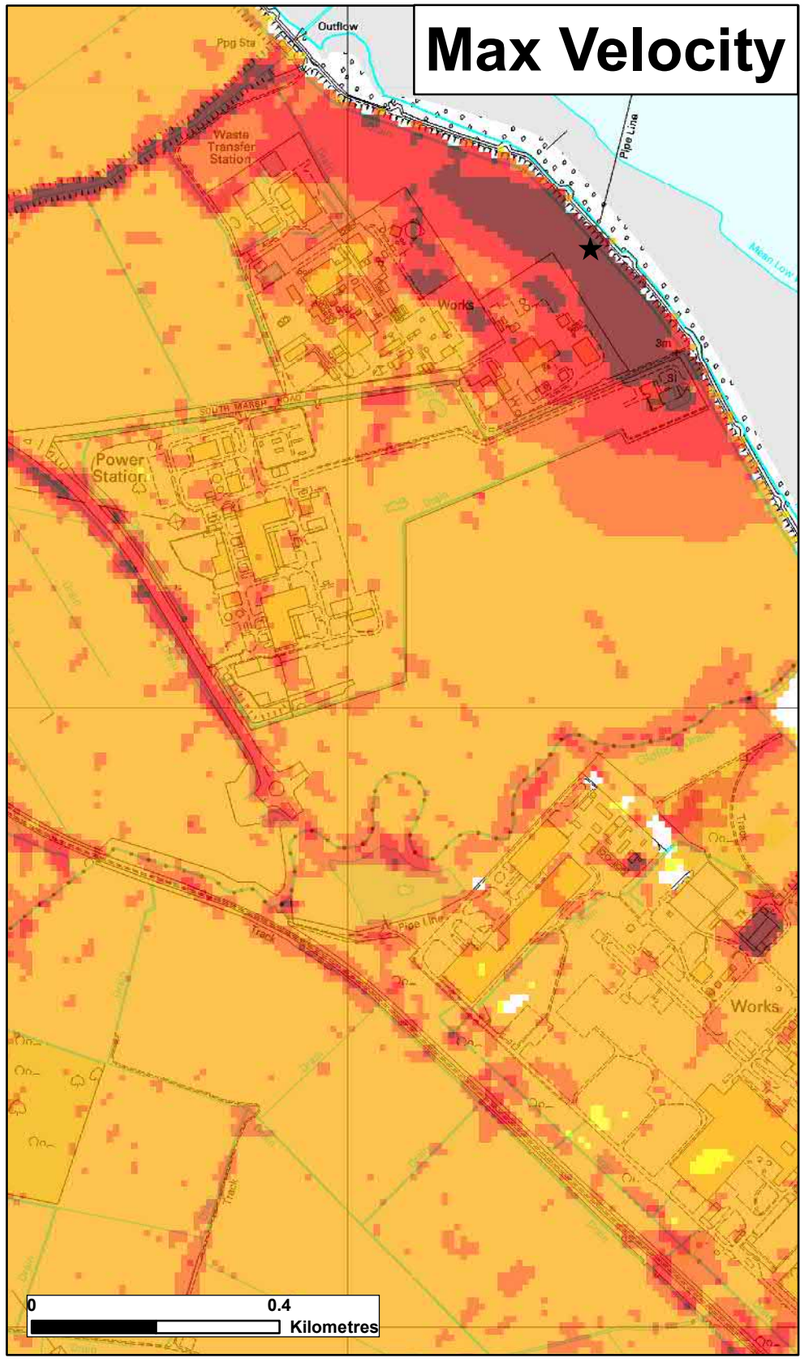

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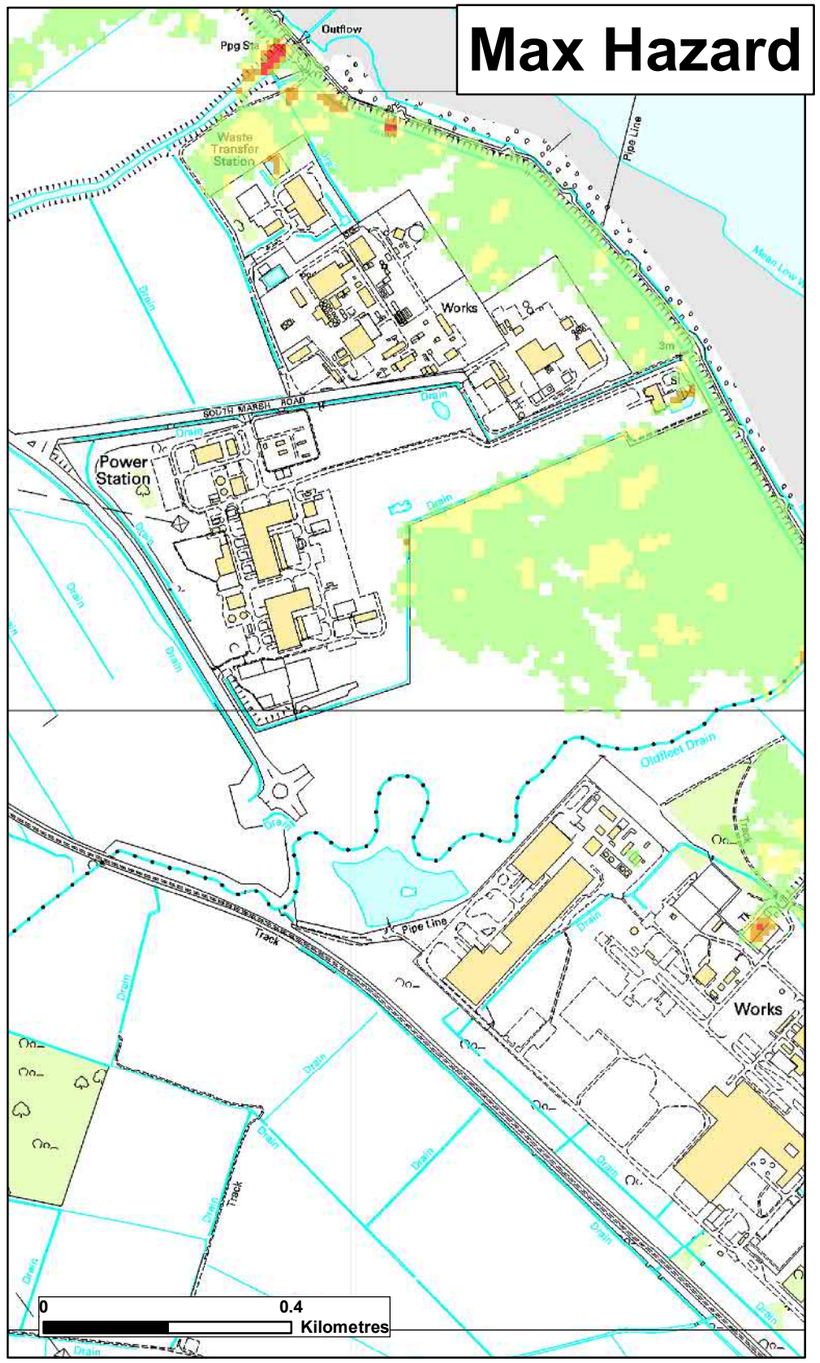

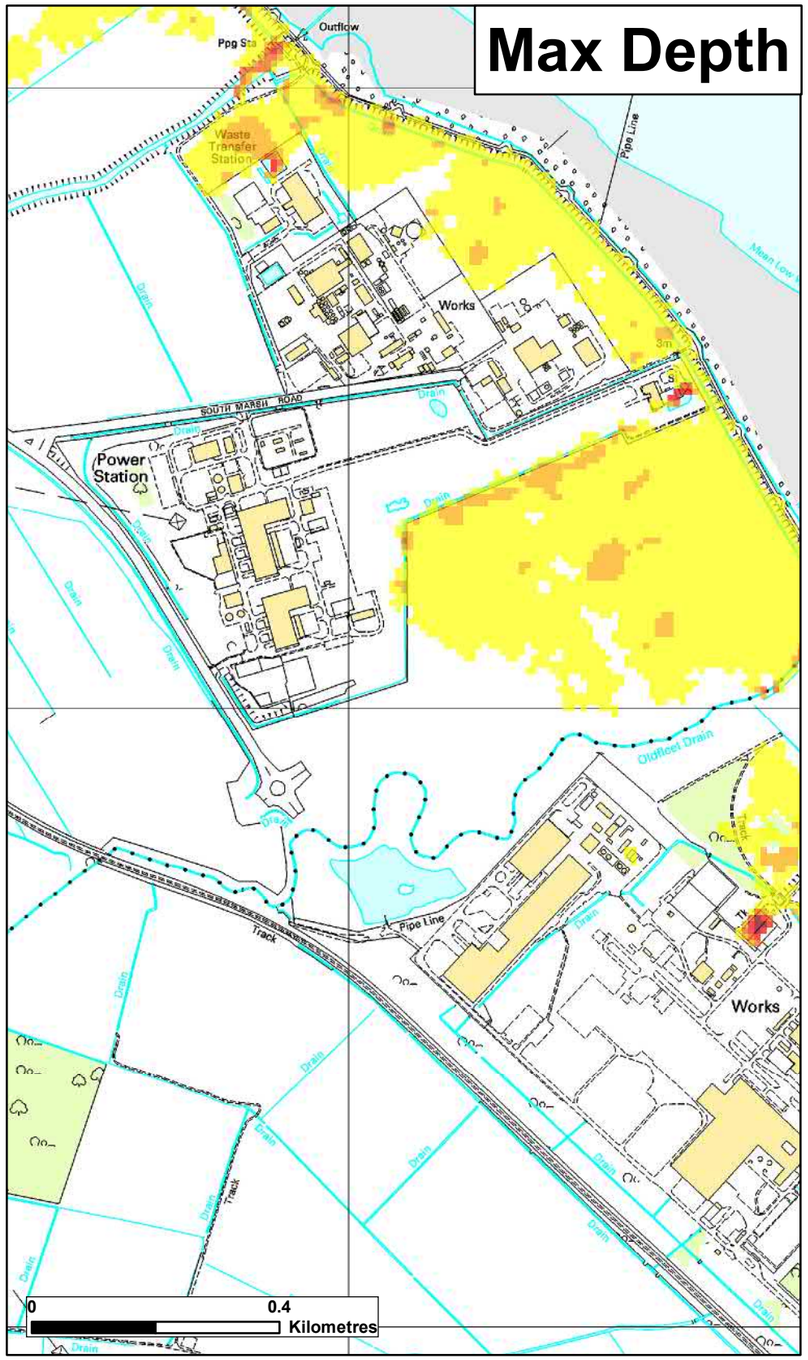

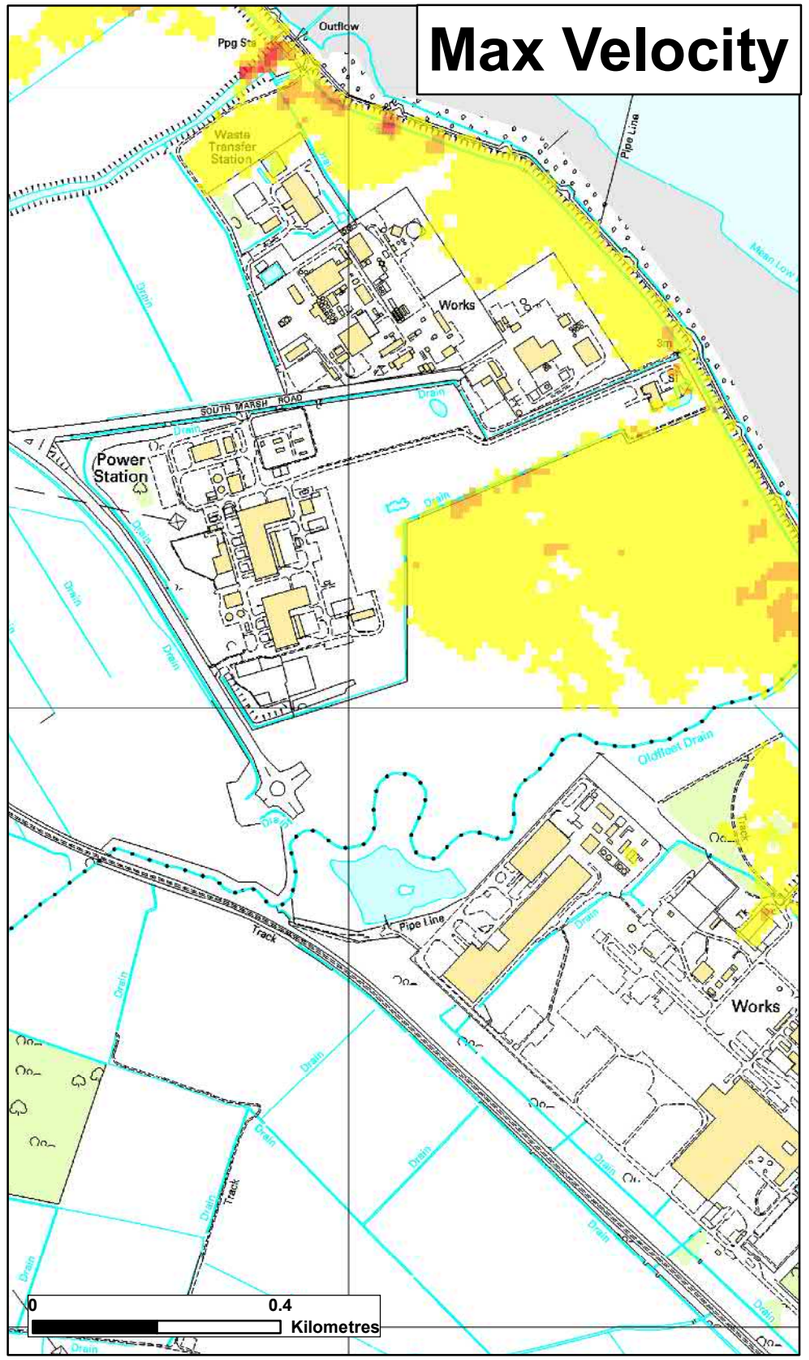

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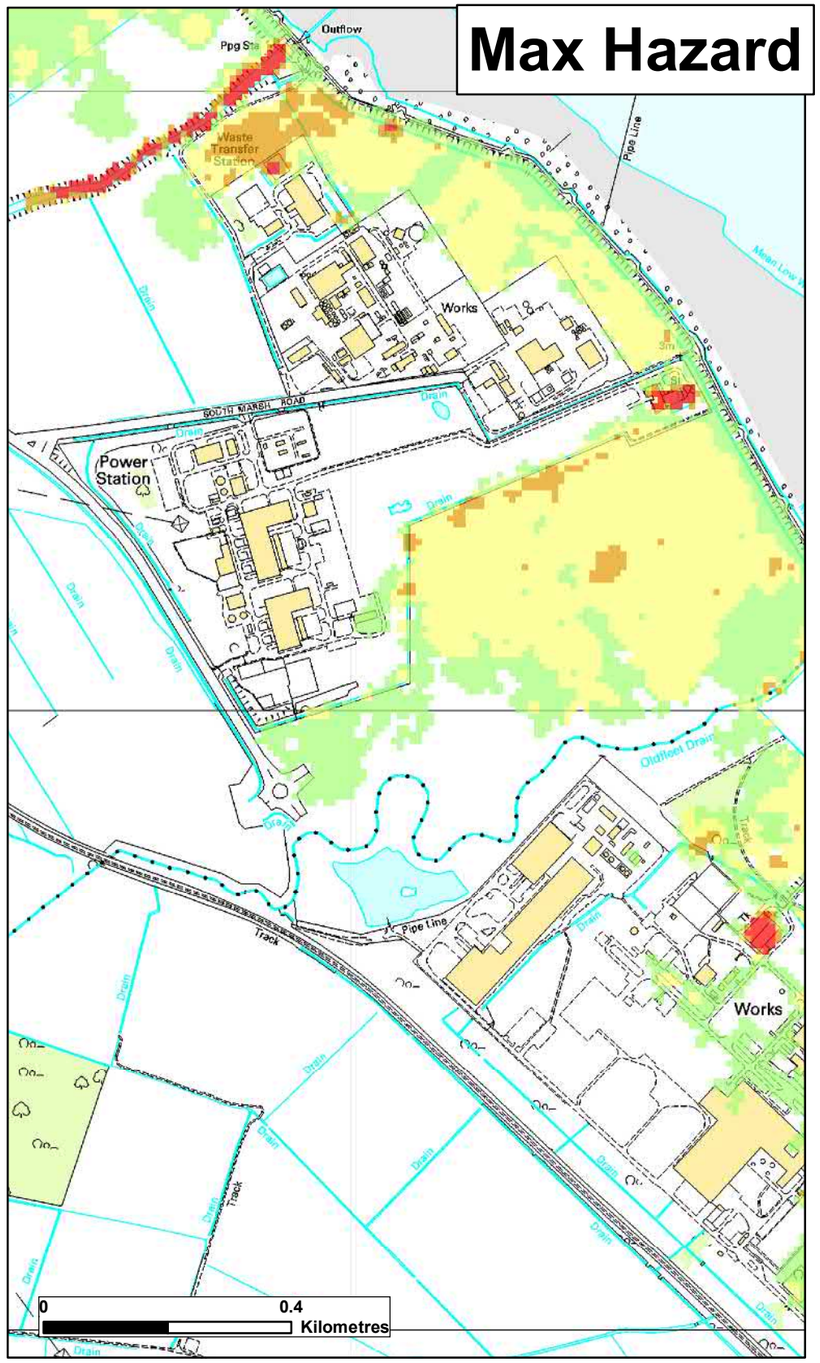

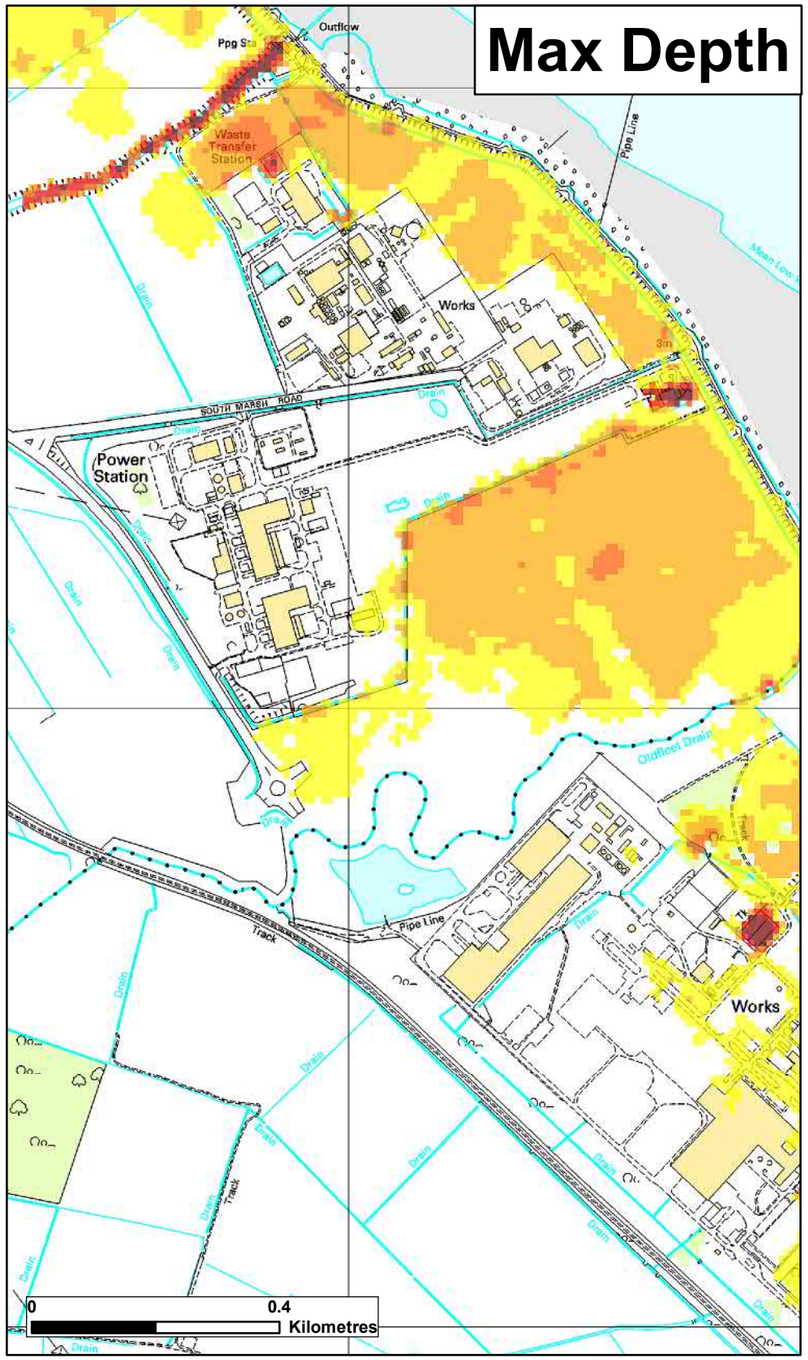

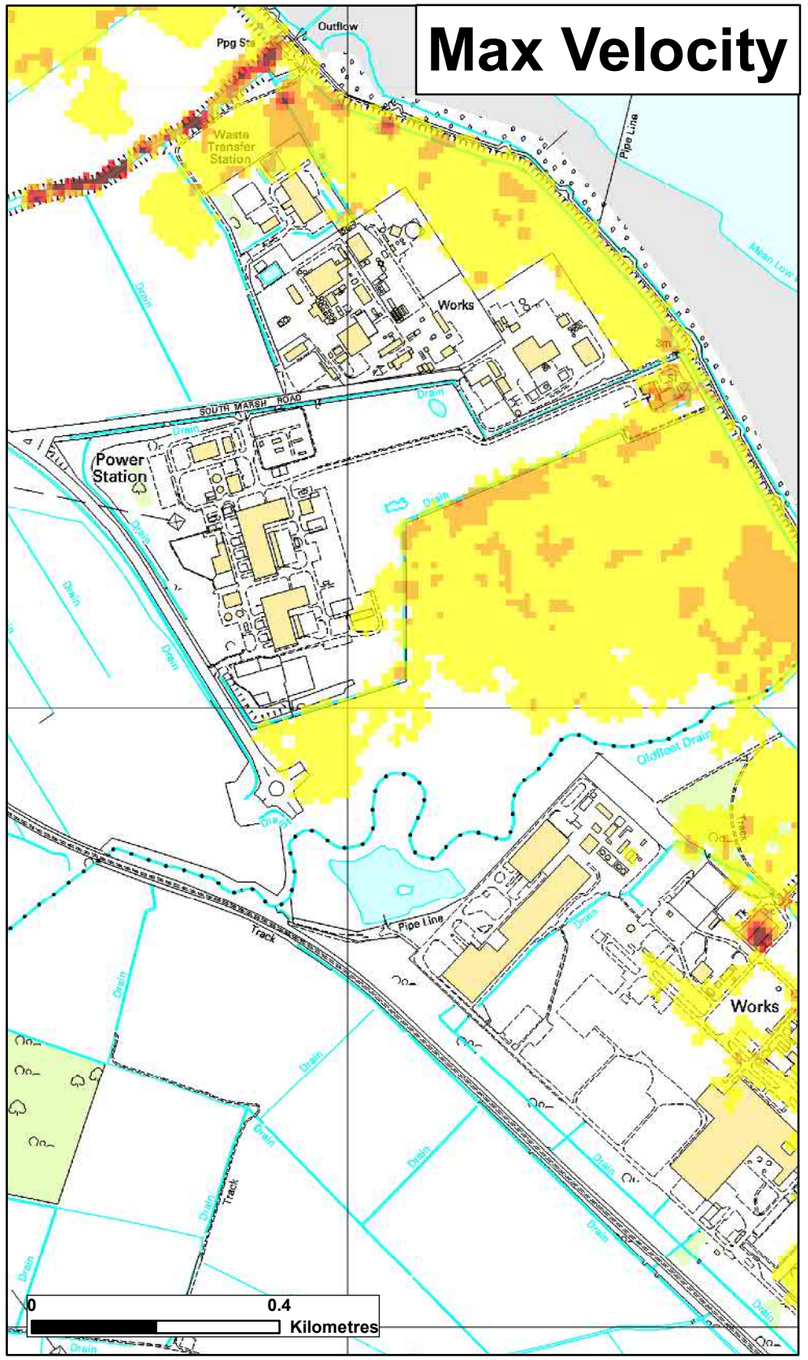

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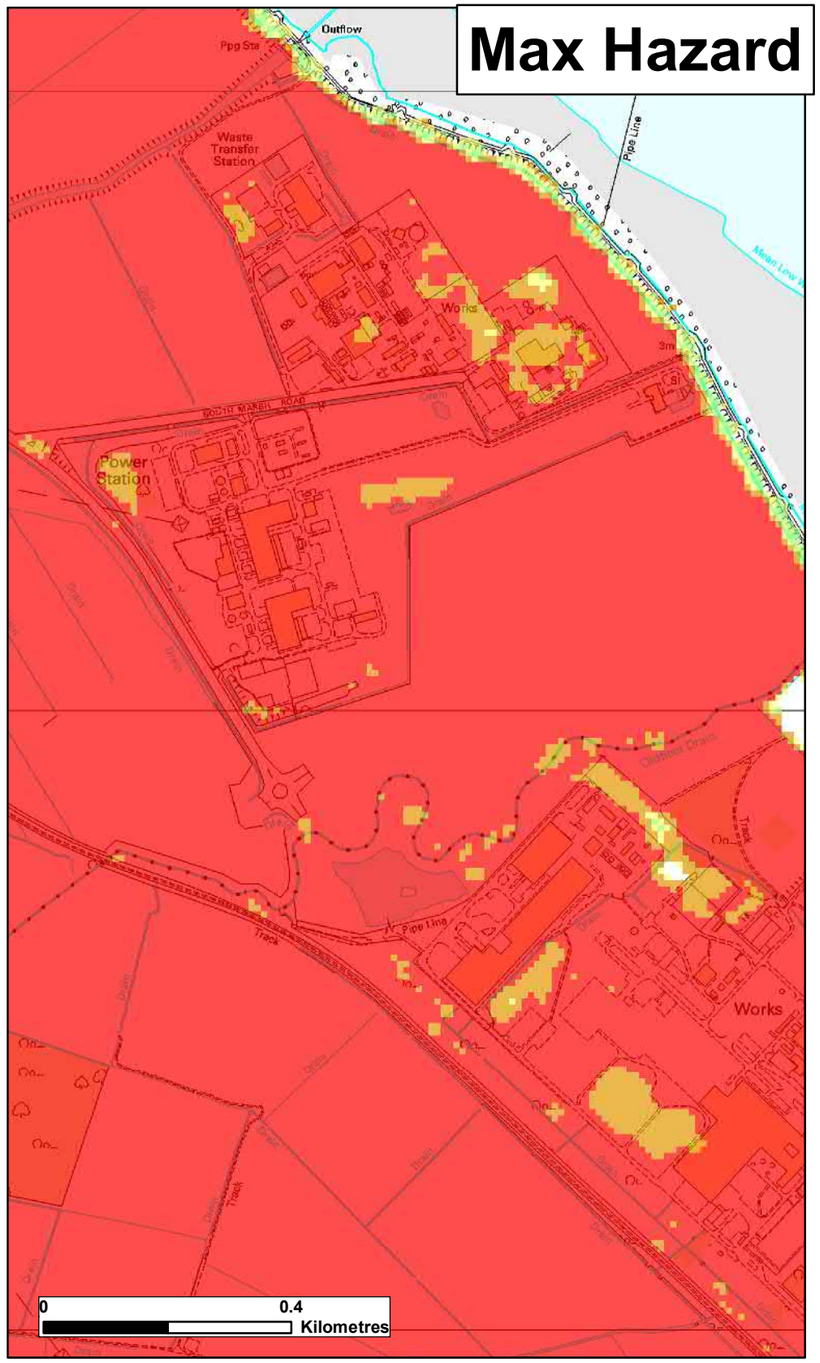

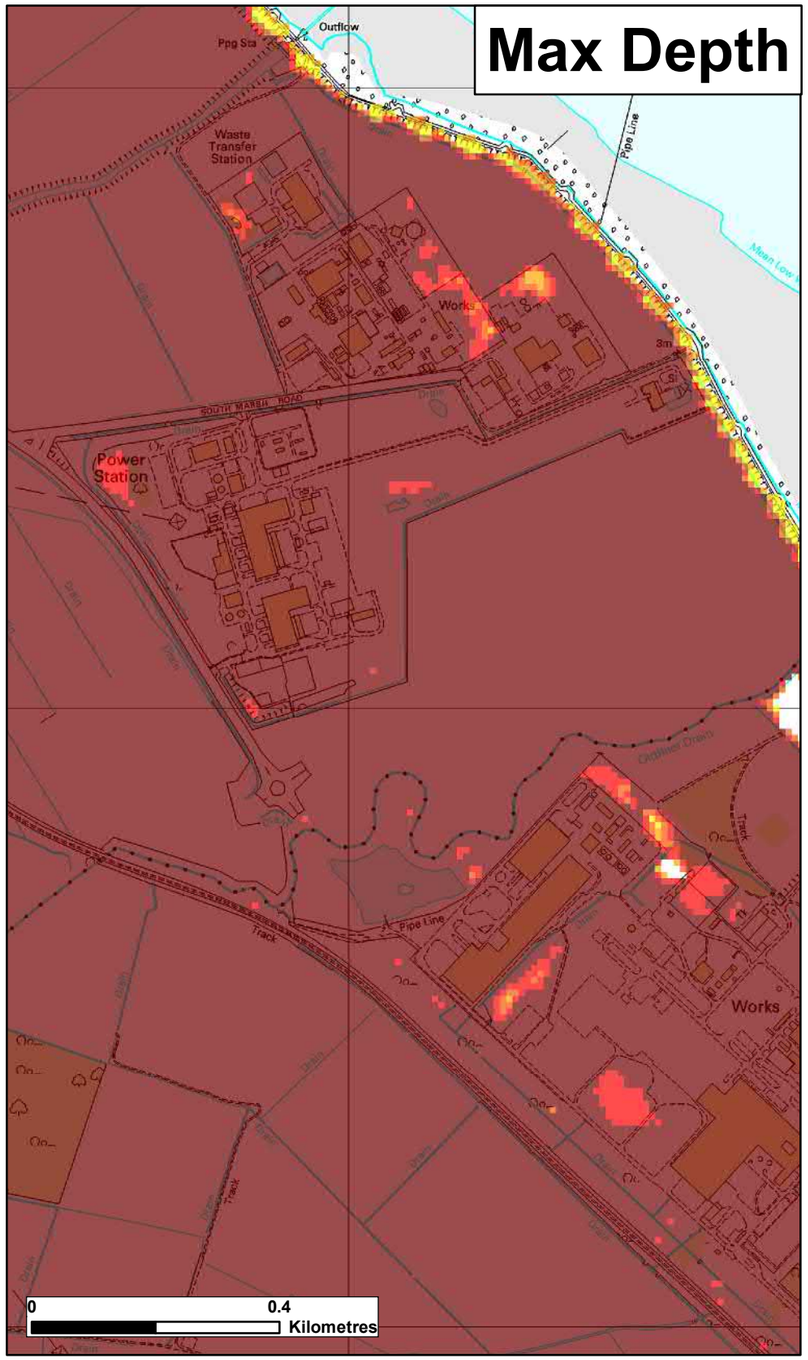

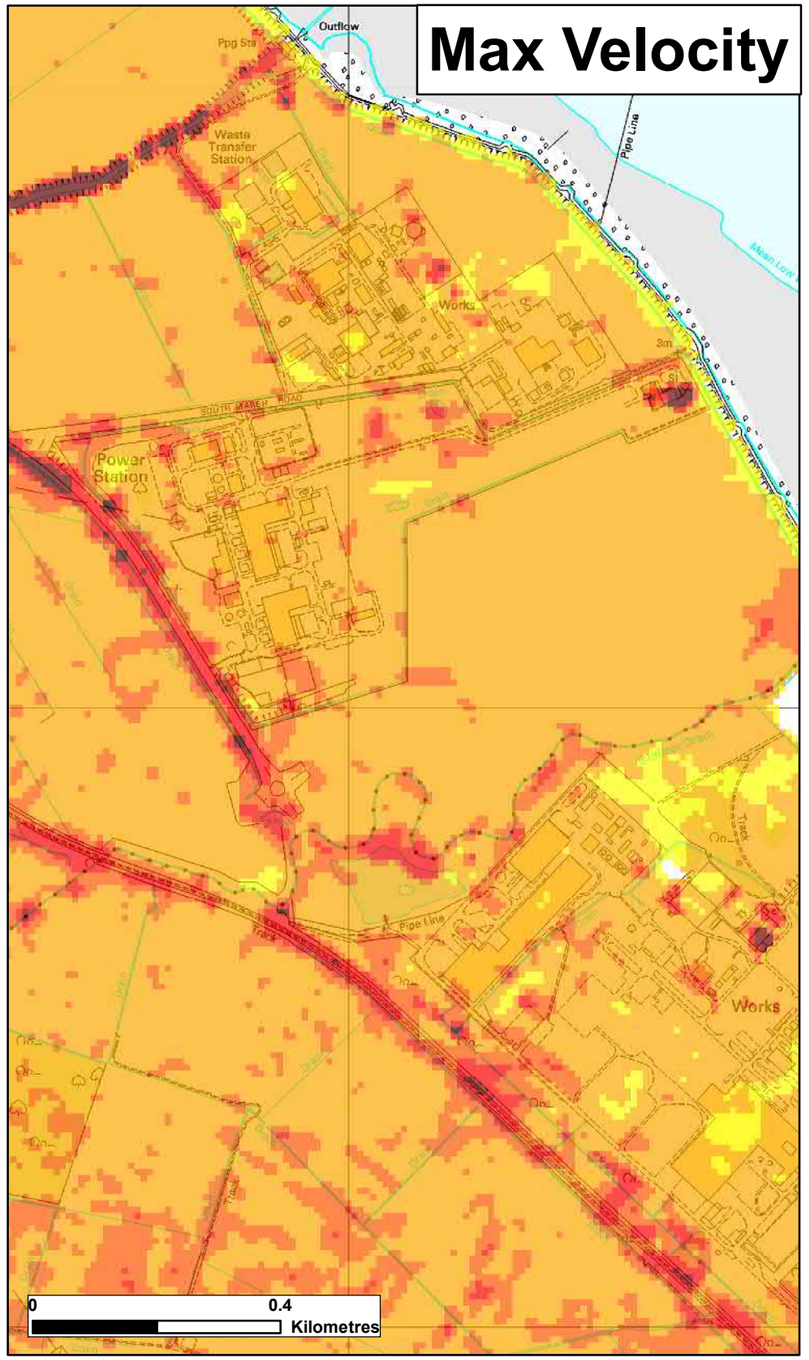

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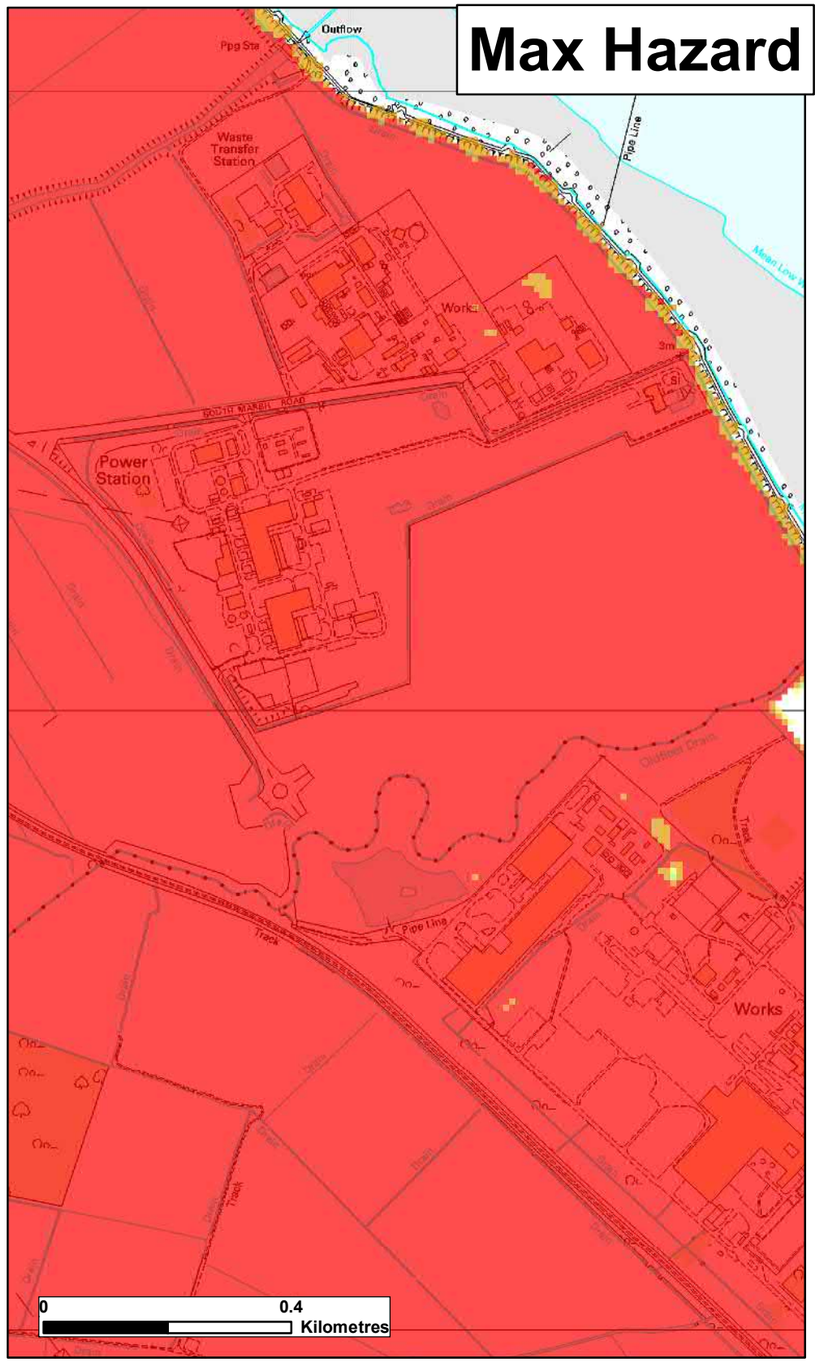

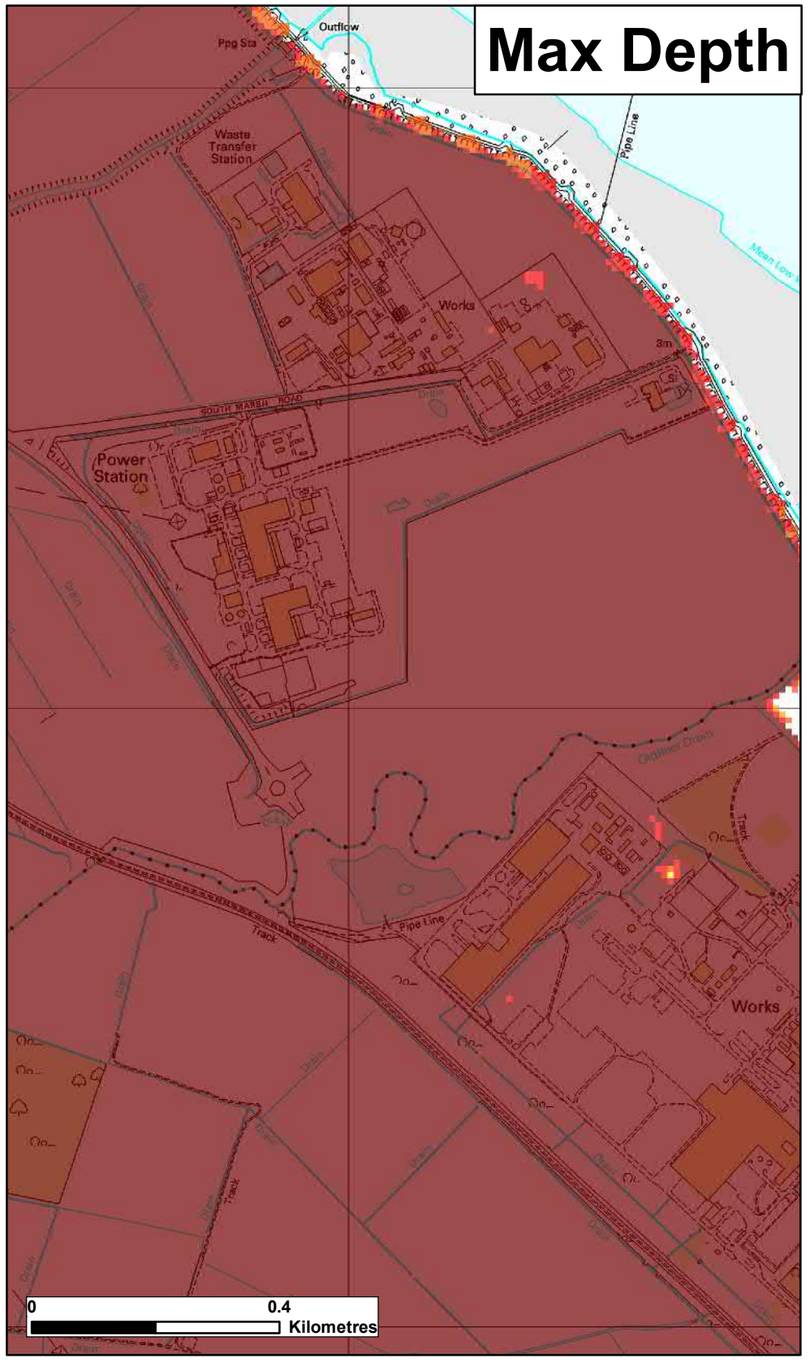

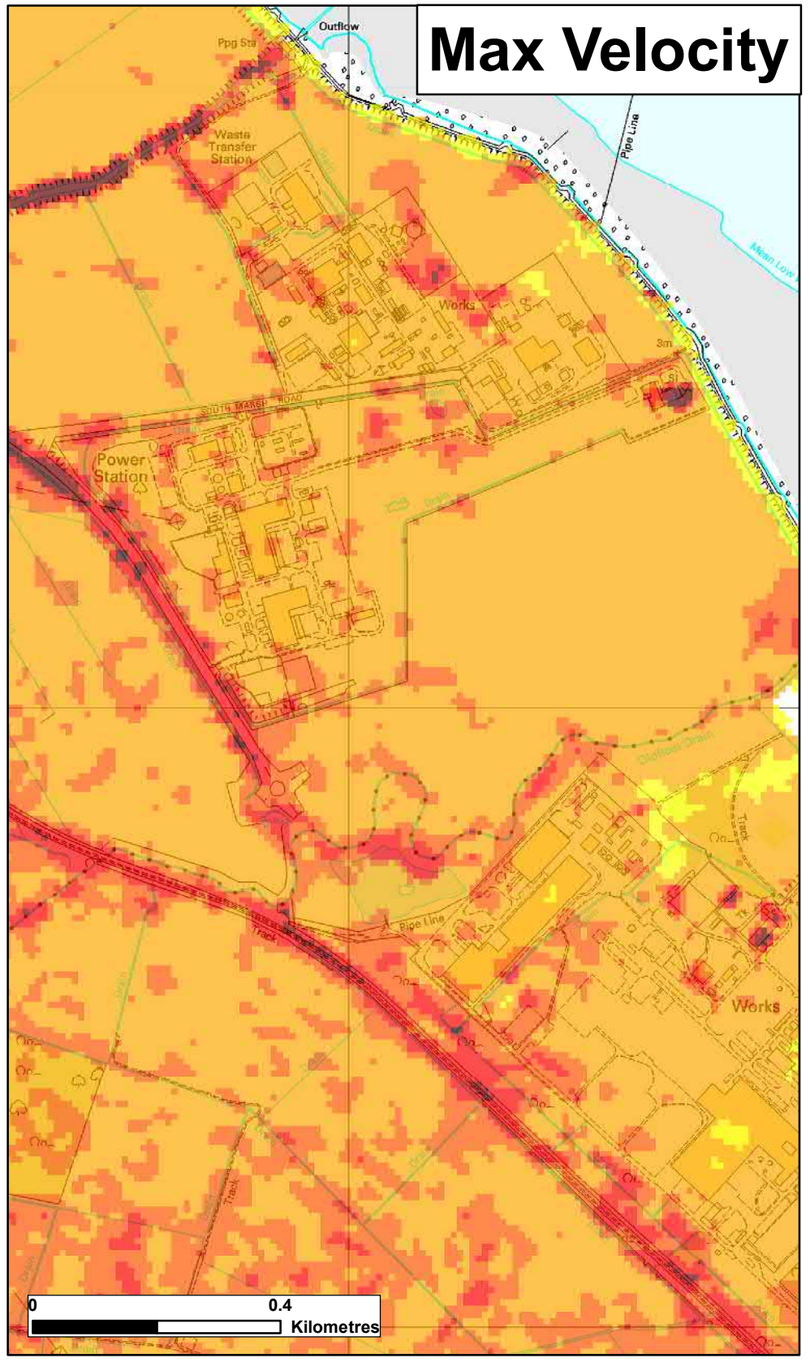

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Environment Agency

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Map Centred on TA 23088 13043

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
rob.eames@environment-agency.gov.uk
+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 <Rob.Eames@environment-agency.gov.uk>
Cc: Kearns, Laura <laura.kearns@aecom.com>; Farr, Nicola <nicola.farr@environment-agency.gov.uk>; Cobb, Kirsty <kirsty.cobb@aecom.com>
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
Direct: +44 (0)1246 244 795
Mobile: +44 (0)7799 611 735

From: Burton, Helen
Sent: 06 September 2018 12:04
To: Eames, Rob <Rob.Eames@environment-agency.gov.uk>
Cc: Kearns, Laura <laura.kearns@aecom.com>; Metcalfe, Phil <Phil.Metcalfe@aecom.com>; Bolton, Alannah <Alannah.Bolton@aecom.com>; Campbell, Ian <ian.campbell@aecom.com>; nicola.farr@environment-agency.gov.uk
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: +44 (0)1246 244 795

From: Eames, Rob [mailto:Rob.Eames@environment-agency.gov.uk]
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
rob.eames@environment-agency.gov.uk
+44 (0) 2084 749436

www.gov.uk/floodsdestroy

From: Burton, Helen [mailto:helen.burton@aecom.com]
Sent: 03 September 2018 12:03
To: Eames, Rob <Rob.Eames@environment-agency.gov.uk>
Cc: Somerton, Joanne <joanne.somerton@aecom.com>; Kearns, Laura <laura.kearns@aecom.com>; Bolton, Alannah <Alannah.Bolton@aecom.com>; Campbell, Ian <ian.campbell@aecom.com>
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
D +44-01246-244-795
M +44-07861-305-838
helen.burton@aecom.com
See my LinkedIn profile

AECOM
Royal Court, Basil Close, Chesterfield, Derbyshire, S41 7SL, United Kingdom
T +44-01246-209 221
aecom.com

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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

ANNEX 2: NORTH EAST LINDSEY INTERNAL DRAINAGE BOARD CONSULTATION

Burton, Helen

From:	Richard Wright <richard.wright@witham3idb.gov.uk>
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: +44 (0) 1522 697123

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
D +44-01246-244-795
M +44-07861-305-838
helen.burton@aecom.com
See my LinkedIn profile

AECOM
Royal Court, Basil Close, Chesterfield, Derbyshire, S41 7SL, United Kingdom
T +44-01246-209 221
aecom.com

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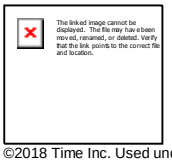

Consultee Comments for Planning Application DM/0575/18/SCO

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.

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.

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.

Registered Office
Anglian Water Services Ltd
Lancaster House, Lancaster Way,
Ermine Business Park, Huntingdon,
Cambridgeshire. PE29 6YJ
Registered in England
No. 2366656.

an AWG Company

Hannah Wilson
Pre-Development Planning Manager