FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT NORTHGATE, WEST PINCHBECK, SPALDING, LINCS

FINAL REPORT

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JULY 2017

GCB/JB Architectural
Design Services

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Fig 1 - Location & Indicative Block Plan – JB Architectural Design Services drg. no. 102-05-LBP01

Fig 2 - Environment Agency Flood Map for Planning

Fig 3 - South Holland District Council Updated Strategic Flood Risk Assessment – 2016 Residual Depth 1 in 100 year Fluvial and 1 in 200 year Tidal events

Fig 4 - South Holland District Council Updated Strategic Flood Risk Assessment - 2116 Residual Depth 1 in 100 year Fluvial and 1 in 200 year Tidal events.

Fig 5 - Black Sluice Internal Drainage Board District Plan

1.0 INTRODUCTION

1.1 An outline planning application is to be submitted by JB Architectural Design Services on behalf of R Longstaff & Co. for proposed residential development on land east of Greenacres, Northgate, West Pinchbeck, Spalding, Lincs.

1.2 Planning approval requires a Flood Risk Assessment to accompany the application to meet the requirements and general principles contained in the Planning Practice Guidance of the National Planning Policy Framework (NPPF) and for approval by the Environment Agency.

The site is shown partly within Flood Zones 2 & 3 of the Environment Agency's Flood Map for Planning. The latest Flood Zone Maps have been created as a tool to raise awareness of flood risk with the public and partner organisations, such as Local Authorities, Emergency Services and Drainage Authorities. The Maps do not take into account any flood defences.

The site is also shown within a defended area of the South Holland District Council's Updated Strategic Flood Risk Assessment Map (2016) and located in the Black Sluice Internal Drainage Board district.

1.3 Geoff Beel Consultancy was appointed on 30th June 2017 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is land east of Greenacres, Northgate, West Pinchbeck, Spalding. The National Grid Reference of the central point of the site is TF 20252630.

2.2 The position and extent of the site are shown on Fig 1 – Location & Indicative Block Plan at the end of the document.

2.3 The site, located within the Black Sluice Internal Drainage Board district is shown partly within Flood Zones 2 & 3 as detailed on the Environment Agency Flood Map for Planning and in a defended area of the Council's Updated Strategic Flood Risk Assessment Map (2016).

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is agricultural land east of Greenacres, Northgate, West Pinchbeck.

3.2 The area of development is approximately 0.20 hectare.

3.3 The proposed site layout consists the construction of 3 pairs of two storey semi-detached dwellings with individual access to Northgate.

3.4 The Sequential Test and Exception Test will require to be applied by the Local Planning Authority but the development may be permitted as the site is protected against the 1 in 100 year fluvial event by a combination of defences, pumping stations and sluice gates meeting the requirements of NPPF.

4.0 EXISTING FLOOD ALLEVIATION MEASURES

4.1 The site is within a defended floodplain, as defined in Appendix 1 of the Environment Agency's 'Policy and Practice for the Protection of Floodplains' and is considered to be passive until such time as a flood greater than that for which the defences were designed occurs. The likelihood of flooding due to overtopping or failure of a flood defence embankments is considered to be small.

4.2 The site is located within the Black Sluice Internal Drainage Board protected by the River Glen defences to the 1 in 100 year return period flood event. Road level of Northgate on the site frontage is 3.70m aOD.

4.3 The site and surrounding land drains to the Gosberton Pumping Station which discharges into the South Forty Foot which ultimately flows into the tidal River Witham.

4.4 The South Forty Foot Drain is an embanked high level carrier conveying the surface water run-off from thousands of hectares of land into the tidal River Witham at Boston.

4.5 Current maintenance standards within the Black Sluice Internal Drainage Board are generally very good.

During the operation and maintenance of its pumping stations, associated structures and channel systems, particularly those that could affect property, the Board seeks to maintain a general standard capable of providing flood protection to its district. A routine maintenance programme is in place to ensure that the Boards assets are commensurate with the standard of protection that is sought. However, bank slips, blocked culverts etc may occur from time to time and these matters are usually dealt with promptly.

4.6 The fluvial River Glen is located approximately 1.00kms to the south of the site with a standard of protection of 1 in 100 years return period.

4.7 Defence and Flood levels of the River Glen at the site frontage are as follows:

	Present	Present + Climate Change	Defence Level
1%	4.46	4.66	5.10

4.8 Maintenance standards of the Environment Agency's main rivers and defences are well maintained and regularly inspected for their asset condition.

5.0 POTENTIAL SOURCES OF FLOODING

5.1 Four potential sources of flooding have been identified as a result of this assessment:

a) local blockages to existing IDB main drain system.
b) storm return period of 1 in 50 years being exceeded
c) failure of Gosberton Pumping Station
d) overtopping and breaching of the fluvial River Glen defences

5.2 The probability of flooding from source a) is low due to the maintenance standards already achieved and managed by the IDB.

The probability of flooding from b) is also low due to Black Sluice IDB main drain design standard incorporating a minimum 900mm freeboard to the lowest land level which provides adequate storage in events greater than 1 in 50 years.

5.3 Failure of Gosberton Pumping Station may occur due to long term mechanical breakdown or power supply being disrupted. However, in these circumstances, if conditions were such to put properties and land at risk of flooding, the Internal Drainage Board would take emergency action to maintain the drainage level of service by utilising temporary pumping equipment. The probability of such an occurrence is also considered to be low.

Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1 in 100 year events, caused no flooding to any residential properties at the time and the Boards policy is to provide a standard of drainage which satisfies NPPF requirements of a 1 in 100 year return period for fluvial protection inclusive of the effects of climate change and development. The Boards policy regarding the connection of future developments to the arterial system enables a flexible approach to be adopted and meet the criteria for "sustainable urban drainage". The probability of the site flooding from this potential source is also considered to be low.

5.4 The possible overtopping and breaching of the fluvial River Glen flood defences which may affect the site under extreme conditions is also considered to be very low. The present standard of defence of 1 in 100 years would most probably have to be exceeded to create such conditions. The River Glen flood defences consist of an earth embankment with road on crest and it is estimated that the floodwaters would not affect the development site, as there is 600mm freeboard above the 1 in 100 year flood level inclusive of climate change.

5.5 The South Holland District Council Updated Strategic Flood Risk Assessment has considered the effect or breach or overtopping to the River Glen defences as shown in Figs 3 and 4.

An estimated depth of floodwater of between 0.00-0.25m could be experienced in year 2116 and it is necessary to mitigate against such a risk ground floor levels of the new dwellings should be 300mm above existing land level with flood resilient construction up to 300mm above finished floor level.

5.6 The developer should ensure that the eventual occupiers of the new dwellings are sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency provides a Flood Warning Service which includes Flood Warning Codes and uses direct warning methods where the risks and impacts of flooding are high. Indirect warnings are provided to all flood risk areas, even those at low risk of flooding. The main method is media broadcasts via local radio and also by television.

In addition to direct and indirect flood warnings, the Environment Agency operates a 24 hour a day Floodline Service providing advice and information on flooding contacting 0345 988 1188 and the occupiers should register with the Floodline Direct Warnings Service to receive any future flood warnings.

6.0 EXTENT OF KNOWN FLOODING

6.1 During the preparation of this assessment, no evidence was discovered of the site being flooded or of any adjoining properties.

7.0 PROBABILITIES AND TRENDS OF FLOODING

7.1 The probability of this development flooding from localised drainage systems is very low. It is also intended to construct floor levels 300mm above existing land level with no sleeping accommodation at ground floor level.

7.2 The probability of the site flooding with water from any Black Sluice river system is less than 1% because of the standards of the existing flood defence systems, storage within existing drainage channels and the location of the site. Similarly the same standard is provided by the Environment Agency's main river and defences.

7.3 If under very extreme events, levels of floodwater from any Environment Agency or Black Sluice river or arterial systems rose to such an extent that the site was affected, the situation would not be sudden. It is very probable that sufficient time would be available to take precautionary actions to limit the extent and potential impact of flooding.

7.4 The water levels in the drainage channels will tend to rise as a result of the impacts of climate change. However the existing systems and defences together with proposed floor levels 300mm above existing land level will be appropriate for the design life of the development (i.e. 100 years).

7.5 Safe and dry access to and from the site would be available onto Northgate and hence to Gosberton Clough where land is in Flood Zone 1.

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Floor levels of the development will be 300mm above existing land level with no sleeping accommodation at ground floor level offering additional protection against impacts arising from any extreme short duration, localised events. Surface water drainage will be discharged to soakaway designed to BRE365 specification and Building Regulations approval.

8.3 The general location of the site within the catchment is such that if flooding occurred from any of the Environment Agency or Black Sluice river systems, then probably 2 to 3 days warning time would be available.

8.4 No displacement of water from the site will affect any adjoining properties and agricultural land.

9.0 RESIDUAL RISK – EXTREME EVENTS

9.1 The residual risk from extreme events is very low on this site, because of its location, within a pumped sub-catchment of the Black Sluice IDB area and its location 1.00km from the River Glen fluvial defences consisting of earth embankments.

9.2 Although within Flood Zone 3 according to NPPF classification, the site actually has a very low risk of flooding due to the current standards of drainage and flood defence and land levels. The site is not located within a Functional Flood Plain of any 'main river' or 'main drain'. The Environment Agency Flood Map for Planning has been produced irrespective of existing flood defences and standards of protection.

9.3 South Holland District Council in conjunction with the Environment Agency and the local IDB's within the Council area have carried out an Updated Strategic Flood Risk Assessment of the whole District by appointed Consulting Engineers.

The Updated Strategic Flood Risk Assessment has produced more definitive Flood Risk Maps similar to those published by the Environment Agency and at the same time has analysed flood return periods of all tidal and fluvial defences for years 2016 and 2116 to account for the effects of climate change.

Breach scenarios of embankments failing and/or being overtopped have also been carried out to establish Flood Risk Zones.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 As a result of the assessment, the following conclusions have been reached:-

- The proposed development is not in a Functional Floodplain. It is located in the Passive Floodplain protected by defences to a 1 in 100 year return period.

- Although the site is in Flood Zone 3, the actual risk of site flooding from any Environment Agency river system is very low.

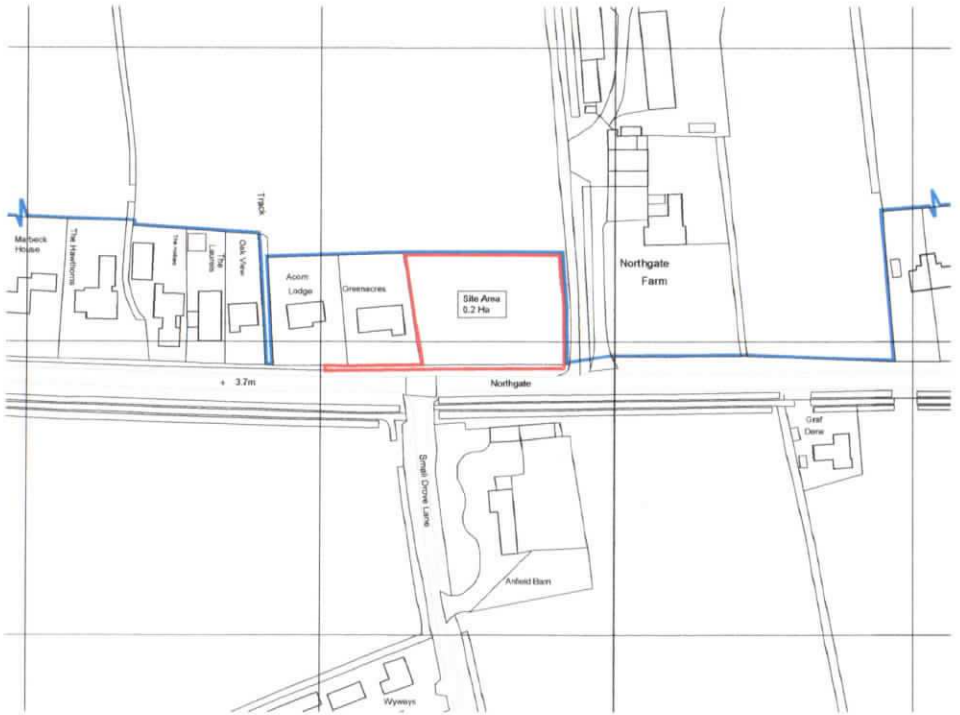
- Although the site is located within an Internal Drainage District with a minimum standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. Freeboard to design water level of 900mm to lowest land level is available for events greater than 1 in 50 years providing further storage within the drainage channels.

- Floor levels will be 300mm above existing land level with flood resilient construction up to 300mm above finished floor level and no sleeping accommodation at ground floor level.

- On site surface water drainage will be discharged to soakaway to BRE365 specification and Building Regulations approval.



ative Block Plan **1:500**



Location Plan **1:1250**

JB Architectural Design Services
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Drawing: Location & Indicative Block Plan

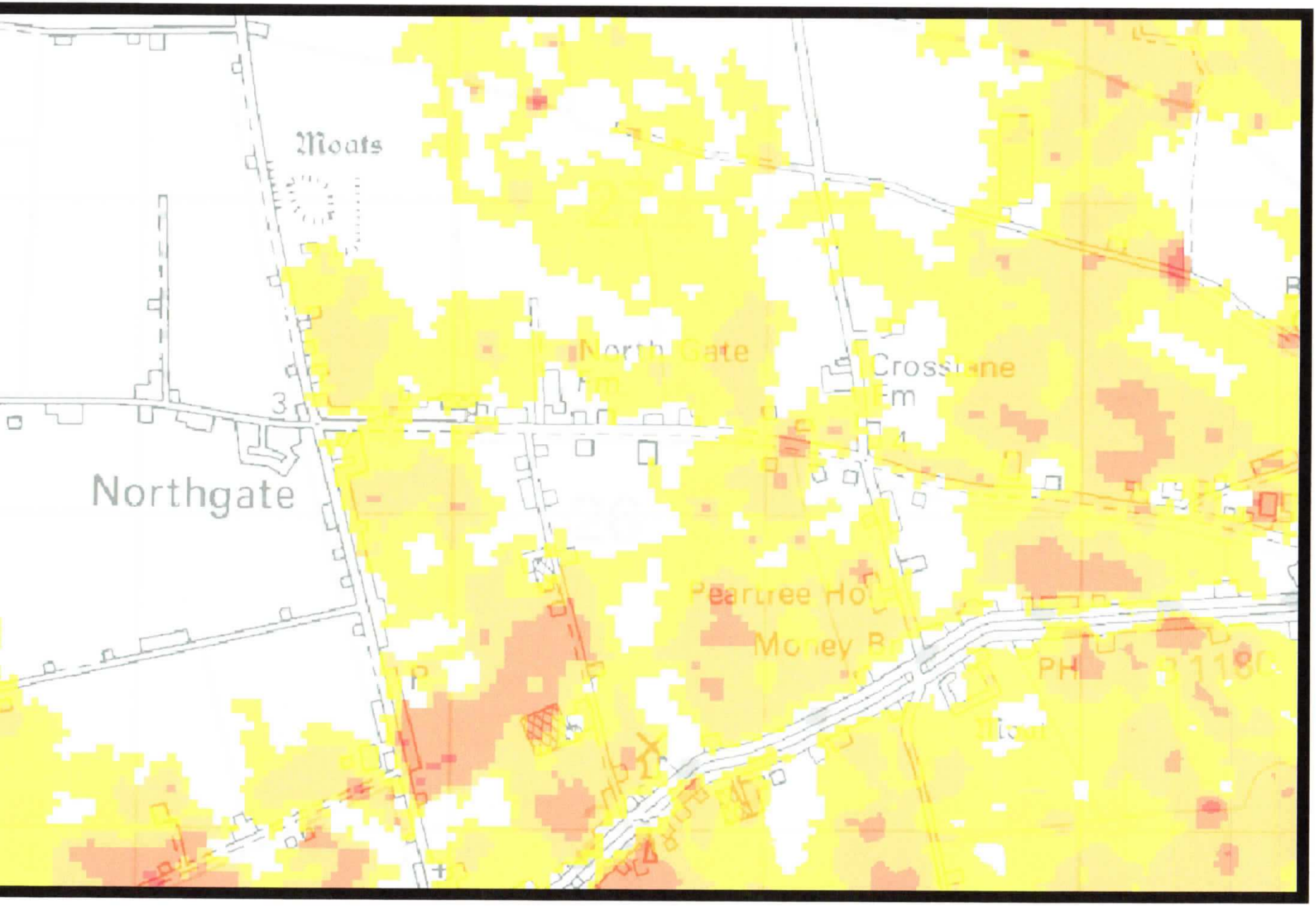
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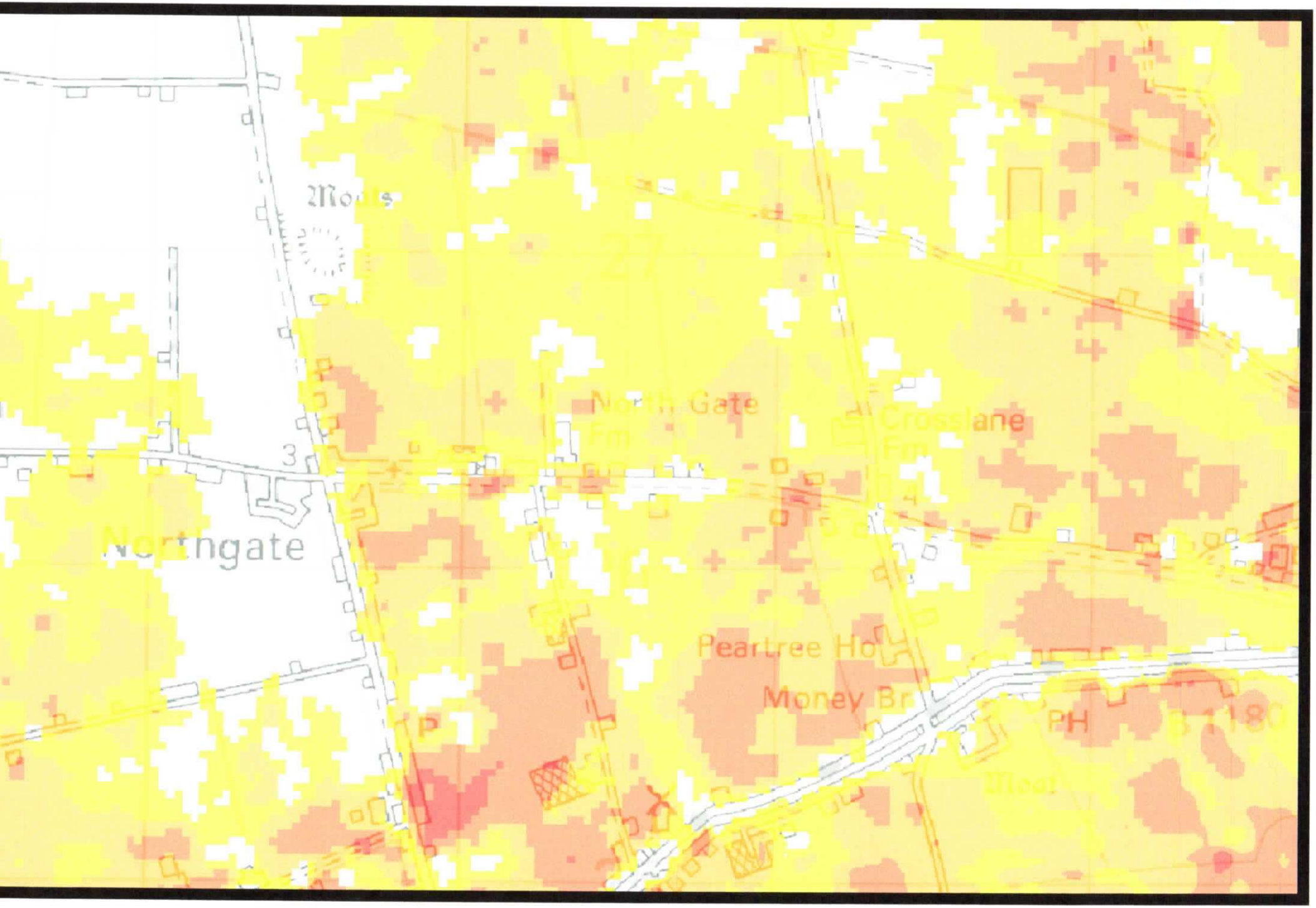
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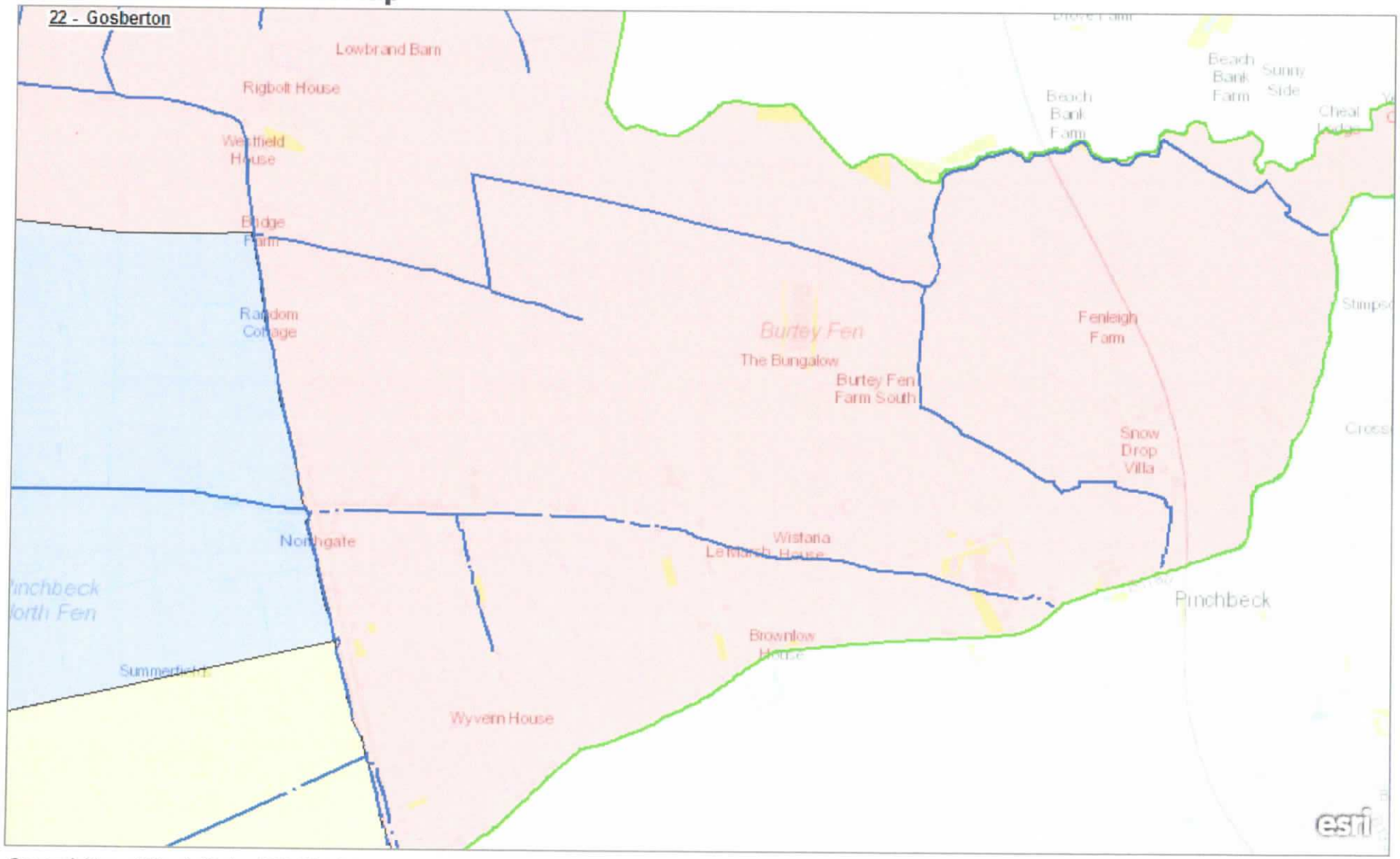

Greenacres
Farm
Northgate
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Black Sluice IDB District Map



General Map of Black Sluice IDB District