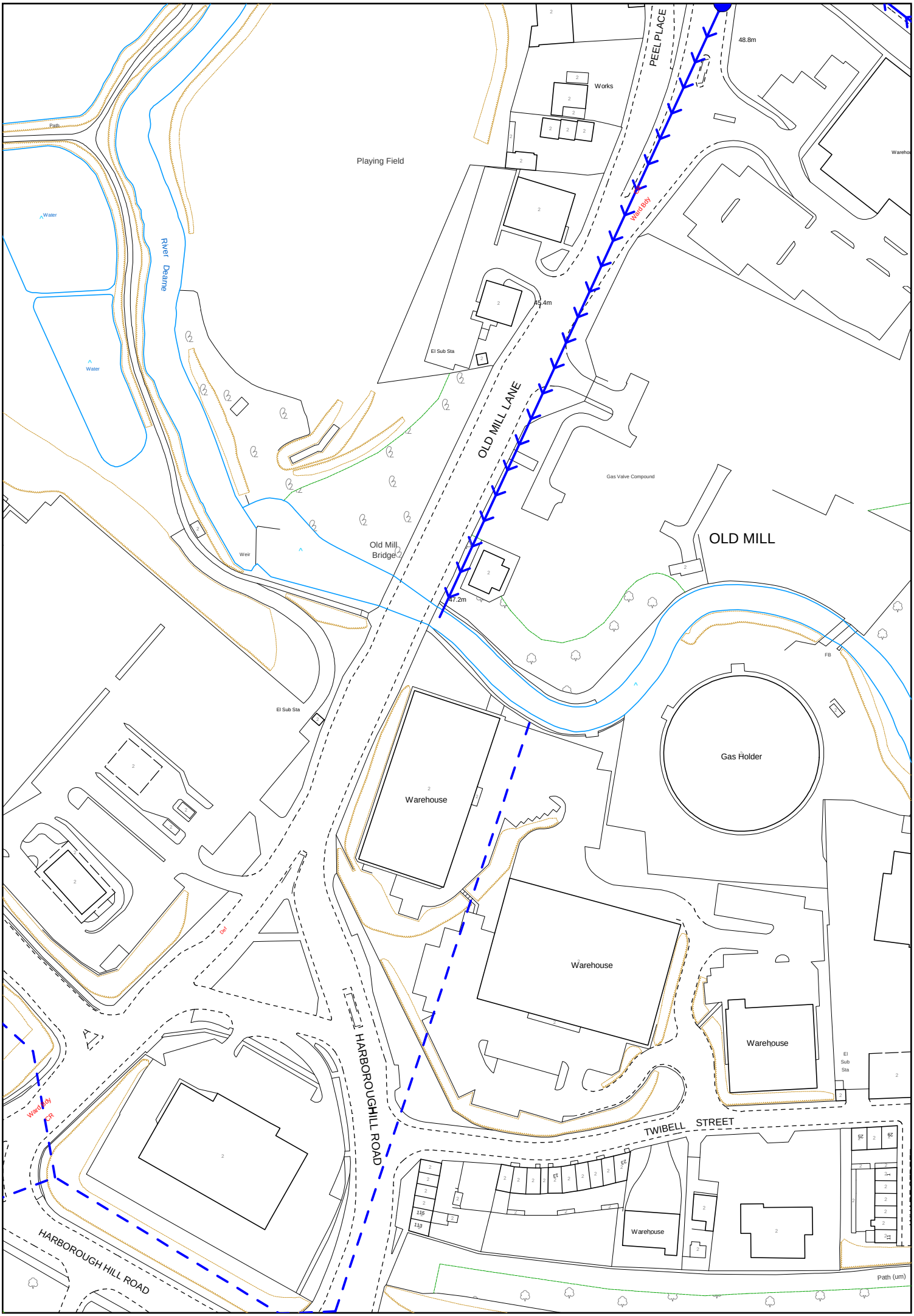

PEEL PLACE
48.8m
Works
Playing Field
Path
Water
River Deame
Water
Ward Bdy
45.4m
El Sub Sta
OLD MILL LANE
Gas Valve Compound
OLD MILL
Old Mill Bridge
Weir
47.2m
FB
El Sub Sta
Gas Holder
Warehouse
Warehouse
Warehouse
El Sub Sta
TWIBELL STREET
HARBOROUGH HILL ROAD
Ward Bdy
CR
HARBOROUGH HILL ROAD
Warehouse
Path (um)

creating a better place

Environment Agency

Sarah Hamilton
WSP Group
Three White Rose Office Park
Millshaw Park Lane
Leeds
LS11 0DL

Our ref: RFI/2011/17472
Your ref:

Date: 4 July 2011

RECEIVED
-5 JUL 2011

Dear Sarah

Provision of Product 4 for Old Mill Lane, Barnsley

Thank you for your request of 10 June 2011 to use Environment Agency data, Product 4, in the development of the above site. The information is attached.

If you have requested this information to help inform a development proposal, then you should note the detail in the attached advisory text on the use of Environment Agency Information for Flood Risk Assessments / Flood Consequence Assessments.

Supporting Information

Flood Zone

- *Please can you confirm what flood zone the site lies within?*
- *Whether or not the flood zones will be updated in the near future.*

Please see the enclosed extract from the Flood Map.

The Flood Map provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences.

The Flood Map shows the following:

1. Flood Zone 3 (dark blue area on the enclosed map): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences
   - For flooding from rivers the map indicates the extent of a flood with a 1% (1 in 100) chance of happening each year;
   - For flooding from the sea the map shows the extent of a flood with a 0.5% (1 in 200) chance of happening each year.

2. Flood Zone 2 (light blue area): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences.

- Indicates the extent of a flood with a 0.1% (1 in 1000) chance of happening each year.

3. Flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, together with some natural or constructed entities which retain, store or channel water and which may protect against smaller floods.

4. Areas benefiting from flood defences - areas that benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would flood.

The Rights & Responsibilities of a Riverside Owner

The owner of property adjacent to a watercourse is usually deemed to be the riparian owner and, as such, has both riparian rights and responsibilities with regard to the watercourse within their ownership.

The responsibility for general maintenance and repair of the watercourse and its banks rests with the riparian owner. For more information on Rights and Responsibilities of a riverside owner, you can visit our website at: www.environment-agency.gov.uk and click on 'Flood', 'How can I be prepared?, 'Guidance for riverside property owners' and download the 'Living on the Edge' booklet.

Alternatively type the following address into your web browser:
http://www.environment-agency.gov.uk/homeandleisure/floods/31626.aspx

Flood Zones

Under Planning Policy Statement 25 Development and Flood Risk (PPS25) land is divided into three zones with regard to flood risk.

Zone 1, little or no risk, this is land outside the 1 in 1000 year flood plain, land deemed to be safe from flooding in the event of a flood with a 0.1% probability of occurring in any one year.

Zone 2, medium risk; land between the 1 in 1000 and 1 in 100 year fluvial (1 in 200 year tidal) flood plain. Between 0.1% and 1.0% (0.5%) probability of occurring in any one year.

Zone 3, high risk, land within the 1 in 100 year fluvial (1 in 200 year tidal) flood plain, at risk in the event of a flood with a 1.0% (0.5%) probability of occurring in any in year.

These zones do not take account of any flood defences that may exist as these could be overtopped or breached by a more severe flood event than designed for or maintained against.

Site Assessment;

From the supplied plan the site lies within flood zones 1, 2 & 3 on the Environment Agency Flood Map. The attached map confirms this.

Surface Water

There should be no increase in surface water runoff from the new development.PPS25 recognises that the management of flood risk is not simply restricted to flood plains and that a catchment-wide approach should be employed.

If the existing site is shown to drain to a watercourse, then surface water runoff should be attenuated to provide a 30% reduction in the final surface water discharge from the site when compared with the existing site outflow prior to redevelopment. However, if the site does not drain to a watercourse or public sewer at present, then flows must be attenuated to a maximum of 5 l/s/ha, equivalent to the Greenfield runoff rate.

Where surface water runoff drains to a public sewer, further advice on acceptable discharge rates should be sought from the Local water Authority.

Any balancing facility should be designed to accommodate a 1 in 30 year flow from the site below ground and a 1 in 100 year flow retained within the site (including an allowance for climate change), without causing ay flooding to buildings.

There are alternatives to conventional storage for the control of surface water run-off that are favoured by the Environment Agency where ground conditions are suitable. Sustainable Urban Drainage techniques (SUDs) tackle surface water run-off problems at source using features such as soakaways, permeable pavements, grassed swales, infiltration trenches, ponds and wetlands to attenuate flood peak flows, produce water quality improvements and environmental enhancements. The Environment Agency seeks to promote the use of SUDs techniques to this site and the expects the developer of the site to submit detailed investigations such that the use of SUD's has been fully explored.

More information on SUDs can be found at: http://www.ciria.org.uk/suds/

For information on Green Roofs in particular, please visit:
www.thegreenroofcentre.co.uk

Further Questions

We would prefer a clear span bridge rather than any pier in the channel with the deck soffit at 1 in 100 + climate change with a minimum 600mm freeboard. You would need to take into account erosion/scour protection.

If you wish to discuss the site with the engineer dealing with the Barnsley area Lesley Slaney can be contacted on (0113) 213 4779.

Watercourses

- *Details of any watercourses / culverted watercourses in the vicinity and who is responsible for their maintenance;*
- *Minimum set back distances from any watercourse and governing statute / byelaw.*

The watercourse in the vicinity of the site is on the outer perimeter known as the River Dearne. Classified as 'main river' therefore the Water Resources Act 1991, and the Yorkshire Land Drainage Byelaws 1980 will both apply. Briefly, these state that there shall be no development (including tipping, fencing, etc.) within 8 metres of the top of the bank, or the landward toe of a flood defence structure, without the prior written consent of the Agency. If such development is proposed, then an application with full details must be submitted for consent.

The owner of property adjacent to a watercourse is usually deemed to be the riparian owner and, as such, has both riparian rights and responsibilities with regard to the watercourse within their ownership. The responsibility for general maintenance and repair of the watercourse and its banks rests with the riparian owner.

For more information on Rights and Responsibilities of a riverside owner, you can visit our website at: www.environment-agency.gov.uk and follow the links to 'Flood' then 'Living on the Edge'.

I have attached a link to flood risk standing advice which may be of some help to you to look at for advice on what to do when submitting a planning application and for guidance http://www.environment-agency.gov.uk/research/planning/82587.aspx .

Hydraulic Modelling

- *Whether or not any hydraulic modelling would be required to accompany a PPS 25 FRA and if so, provide some guidance on the level of modelling required (e.g. 1D or 2D);*
- *Does modelling or any other evidence indicate that flood waters can come out of bank upstream / downstream from the site and flood the site by overland flow?*
- *Whether or not hydraulic modelling will be updated in the near future.*

Modelling

Due to this site being located in close proximity to the join between 2 different mapping studies (the 2010 Dearne study and the 2004 Don study which includes the lower Dearne) we have included both sets of data. Both of these studies area modelled without defences.

Flood Modelling - River Don

The River Don Catchment Flood Model was completed by Jeremy Benn Associates in May 2004. See enclosed the ISIS Hydraulic Model Summary Sheets showing modelled water levels and flows for 5 different annual probabilities and additional results for the 0.5% annual probabilities.

2010 River Dearne Flood Risk Mapping

The River Dearne Flood Risk Mapping Study was completed by Halcrow in May 2010. Please see attached table showing water levels and flows for 8 different annual probabilities as well as a location map of model nodes.

Climate Change

See attached appendix B, from the department for Communities and Local Government's PPS 25 (Planning Policy Statement), for Development and Flood Risk.

Flood Defences / Other Structures

- *Details of any flood defences in the area including standard of protection, condition, type and who is responsible for maintenance;*
- *Details of any proposals for any future flood alleviation scheme that could affect the site and if so, provide details and timescales;*
- *Details of any other man-made structures / sources of flood risk that could affect the site.*

Assets

There are no formal flood defences or structures in this area that contribute towards reducing flood risk.

LIDAR Data

Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. This technique results in the production of an accurate, cost-effective terrain model suitable for assessing flood risk and other environmental applications.

The Environment Agency owns two LIDAR systems, which are installed in a survey aircraft along with its other operational remote sensing instruments.

The aircraft is positioned and navigated using Global Positioning System (GPS) corrected to known ground reference points. The aircraft typically flies at a height of about 800 metres above ground level and a scanning mirror allows a swath width of about 600 metres to be surveyed during a flight.

To get a license for the data you will need to contact our Science Group, stating the area you are interested in (preferably an OS Grid Reference, or a map with the area outlined). There may be a charge for this data.

Low resolution Data is returned as an ASCII grid, which can easily be converted to a surface model for use in most GIS applications, and is provided in 2km x 2km tiles, at a resolution of 2m.

High resolution Data is also returned as an ASCII grid, in 0.5km x 0.5km tiles, at a resolution between 0.125 and 0.5m.

For current catalogue of coverage see: http://www.geomatics-group.co.uk/GeoCMS/order.aspx

To obtain the data and license agreement, please contact:

Environment Agency Geomatics
Phoenix House
Lower Bristol Road
Bath BA2 9ES
Tel: 01225 487658
Fax: 01225 487643

E-mail: archived-lidardata@environment-agency.gov.uk
Or visit the website at www.geomatics-group.co.uk

Previous flooding records

- *Any previous flooding records and if so dates, source, depth, extent and any further detail.*

To the best of our knowledge there is no known flood history for this site. However, in close proximity to this location we do have some flood history available (see enclosed map).

Water causing flooding can come from different places, for example from rivers or the sea; surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system); overflowing or backing up of sewers or drainage systems which have been overwhelmed or from groundwater rising up from underground aquifers.

Currently the Environment Agency can only supply flood risk data relating to the risk of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding or drainage systems that have been overwhelmed. Local Authorities and/or Water Companies may be able to provide some knowledge on the risk of flooding from sources other than rivers and the sea and we are working with these organisations to improve knowledge and understanding of surface water flooding.

Groundwater

- *Details of any groundwater levels in the vicinity of the site;*
- *Whether or not the site lies within a Groundwater Source Protection Zone;*
- *Details of any groundwater flooding issues in the area.*

We have no information relating to groundwater levels or groundwater flooding for this area.

Details of the location of Source Protection Zones and areas of Groundwater Vulnerability are available on our website under the Groundwater section of our online interactive mapping tool 'What's in your backyard' available at the following address.

http://www.environment-agency.gov.uk/homeandleisure/37793.aspx

Information relating to how Groundwater Vulnerability and Source Protection Zones are determined is available at the following online addresses.

Source Protection Zones:
http://www.environment-agency.gov.uk/homeandleisure/37833.aspx

Groundwater Vulnerability:
http://www.environment-agency.gov.uk/homeandleisure/117020.aspx

Reservoir Flood Risk

- *Whether or not the site is located within an area susceptible to reservoir flooding, and provide a copy of the Reservoir Flood Map to confirm this.*

In respect to Reservoir flood risk, please refer to the "Risk of Flooding from Reservoirs" map on our website at the following location: http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=reservoir&layerGroups=default&lang=_e&ep=map&scale=3&x=531500&y=181500

If you require any further assistance, please refer to the contacts available on the website.

Surface Water

- *Whether or not the site is located within an area susceptible to flooding from surface water and provide a copy of the Surface Water Flood Map;*
- *Details of any restrictions associated with the drainage of surface water from the site;*
- *Whether or not the site is located within a critical drainage area.*

Flood Map for Surface Water

Our new surface water flood map and provides a general indication of areas that may be at risk of surface water flooding. It takes broad account of underground drainage and typical storms which are likely to cause flooding, but these are only typical national figures and are not appropriate everywhere. The map indicates two depths of flooding: greater than 0.1m deep, and greater than 0.3m deep.

For more information about how surface water flood risk is managed in your area, please contact your local authority.

Mitigation

- Details of minimum finished floor levels and freeboard;
- Whether or not the site lies within an EA flood warning area;
- Whether or not there is any local guidance on emergency planning in terms of flooding, such as access and egress arrangements;
- Whether or not the EA would expect a flood plan to be developed and detail the level of information required within it;
- Whether or not compensatory flood storage would be required. If so, please can you confirm that the flood volume occupied by existing buildings on site (that are to be demolished) can be used to offset the flood volume occupied by the proposed buildings;
- Detail the level of flood resilient construction required.

Finished Flood Levels

Setting the ground floor level above site ground level will provide a measure of protection against any flooding. Where available we would recommend that flood levels be set 600mm above the 1 in 100 year event with an allowance for climate change made.

From our records the side does not lie in an EA flood warning area.

Policy

- *Details of any EA flood risk strategy / management documents that cover the site e.g. CFMP, RBMP, SMP, FRM Strategy;*
- *Whether there is a local EA policy in terms of climate change allowances;*

Details of our flood risk strategy/management documents that cover the site such as CFMP, RBMP, SMP, FRM Strategy are all available from our website. I have attached a link to our website
www.environment-agency.gov.uk .

Sequential / Exceptions Test

- *Please can you confirm that the Sequential / Exceptions Test is not required?*

Guidance on when and how to apply the Sequential and Exception Test is set out in national planning policy statement PPS25: Development and Flood Risk and its accompanying Practice Guide. These documents may be downloaded from the Communities and Local Government website using the following link

http://www.communities.gov.uk/planningandbuilding/planningsystem/planningpolicy/planningpolicystatements/ .

We would also advise you to discuss Sequential and Exception Test requirements with the relevant local planning authority.

This information is provided subject to the enclosed notice, which you should read.

If you have any queries or would like to discuss the content of this letter further please do not hesitate to contact us on the number below.

Yours sincerely

C Beech

Cheryl Beech
External Relations Team
Direct Dial 0113 2134732
Email neyorkshire@environment-agency.gov.uk

Days of work - Mon to Thurs

Environment Agency
Phoenix House
Global Avenue
Leeds LS11 8PG

Part of the Environment Agency's Yorkshire and North East Region

Encs Detailed FRA/FCA Map on disk

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Environment Agency

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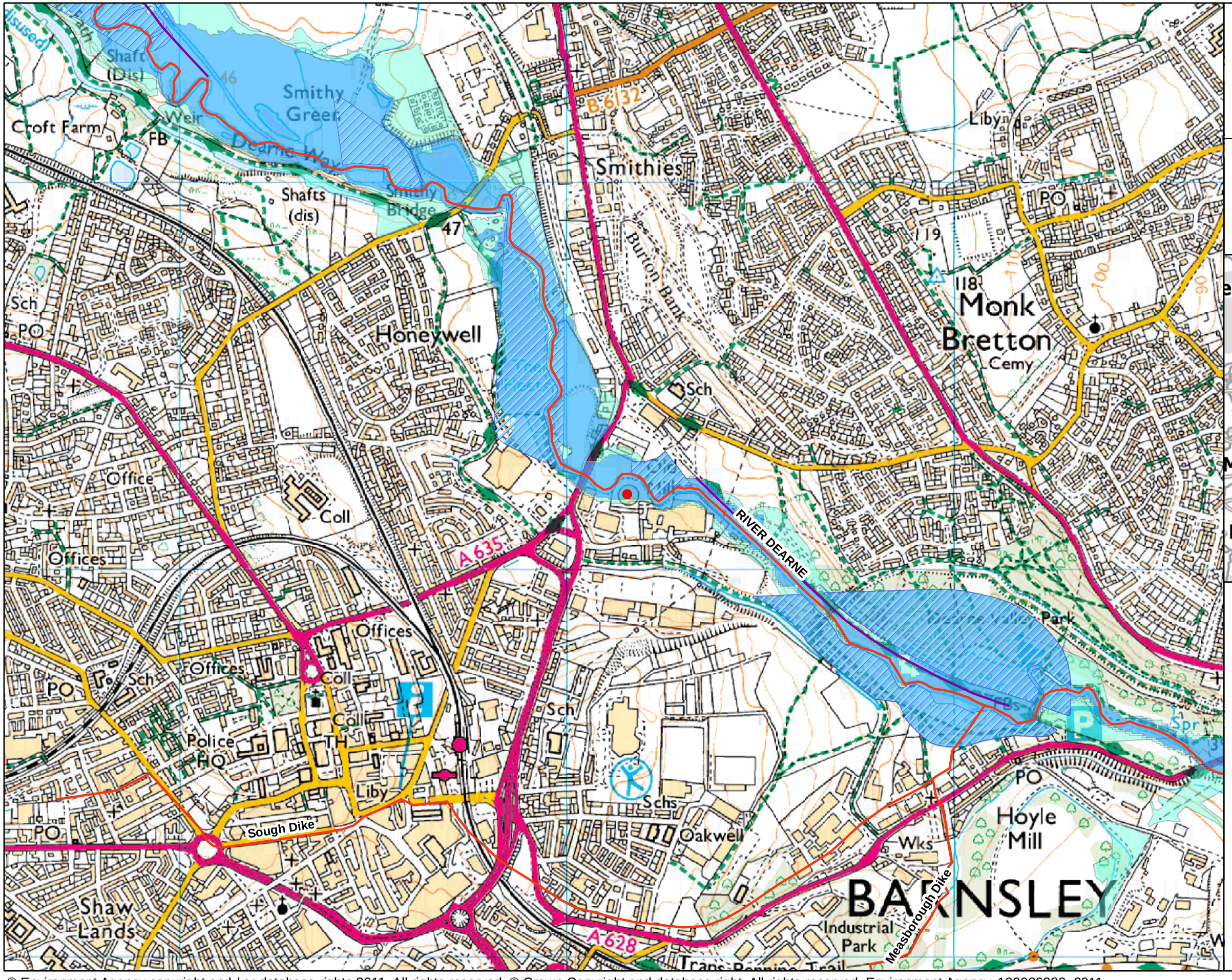
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Contact: enquiries@environment-agency.gov.uk 08708 506506

Flood Map for Old Mill Lane, Barnsley - Date Created 23/06/2011 [Ref: 17472]



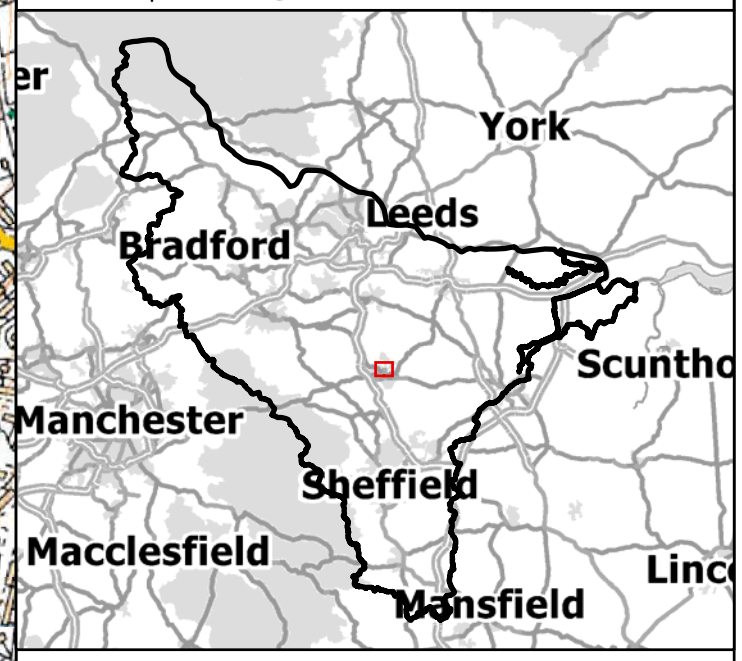
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LEGEND

- Main River
- Flood Map Flood Defences
- Flood Zone 2 (FZ2)
- Flood Zone 3 (FZ3)
- Flood Storage Areas

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Annex B: Climate Change

B1. There is an increasing body of scientific evidence that the global climate is changing as a result of human activity. Past, present and future emissions of greenhouse gases are expected to cause significant global climate change during this century. The nature of climate change at a regional level will vary: for the UK, projections of future climate change indicate that more frequent short-duration, high-intensity rainfall and more frequent periods of long-duration rainfall of the type responsible for the 2000 floods could be expected. Sea levels will continue to rise. These kinds of changes will have implications for river flooding and also for local flash flooding. There are several indications that the climate in the UK is already changing. Central England's temperature rose by almost 1°C during the twentieth century. Heat waves have become more frequent in summer and there are now fewer frosts and winter cold spells. Winters over the last 200 years have become wetter relative to summers; a larger proportion of winter precipitation in all regions now falls on heavy rainfall days than was the case 50 years ago.

B2. To help organisations (including local authorities and regional planning bodies) to assess their vulnerability to climate change and plan appropriate adaptation strategies, the Government established the UK Climate Impacts Programme (UKCIP).[13] Scenarios of future climate change in the UK[14] were produced for the UKCIP in 2002 and published by the Department for Environment, Food and Rural Affairs (Defra). Over the next 2-3 years, this climate change scenario information will be revised, expanded and developed to better meet stakeholder needs.

B3. The companion guide supporting the PPS *Planning and Climate Change*[15] will provide guidance on how planning should secure new development and shape places resilient to the effects of climate change.

B4. The Foresight project on future flood risk reported in April 2004.[16] The project found that, using the UKCIP02 climate change projections, together with scenarios of potential economic and social changes, annual damage from flooding may rise from around £100 million to between £460 million (under the community orientated *Local Stewardship scenario*) and £2,500 million (under the more consumerist *World Markets scenario*) by 2080.

B5. Global sea level will continue to rise, depending on greenhouse gas emissions and the sensitivity of the climate system. The relative sea level rise in England also depends on the local vertical movement of the land, which is generally falling in the south-east and rising in the north and west. Allowances for the regional rates of relative sea level rise shown in Table B.1 should be used as a starting point for considering flooding from the sea, along with the sensitivity ranges for wave height and wind speed in Table B.2, in preparing flood risk assessments.

[13] www.ukcip.org.uk

[14] Defra, 2002. *Scenarios of future climate change in the UK* http://www.ukcip.org.uk/scenarios/ukcip02/documentation/ukcip02_scientific_report.asp

[15] see footnote 1

[16] DTI, 2004. *The Foresight Future Flooding project* www.foresight.gov.uk/Previous_Projects/Flood_and_Coastal_Defence/Reports_and_Publications/Project_Outputs/Outputs.htm

Table B.1 Recommended contingency allowances for net sea level rise

Administrative Region	Net Sea Level Rise (mm/yr) Relative to 1990			
	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
East of England, East Midlands, London, SE England (south of Flamborough Head)	4.0	8.5	12.0	15.0
South West	3.5	8.0	11.5	14.5
NW England, NE England (north of Flamborough Head)	2.5	7.0	10.0	13.0

Notes:

1. For deriving sea levels up to 2025, the 4mm/yr, 3mm/yr and 2.5mm/yr rates (covering the three groups of administrative Regions respectively), should be applied back to the 1990 base sea level year. From 2026 to 2055, the increase in sea level in this period is derived by adding the number of years on from 2025 (to 2055), multiplied by the respective rate shown in the table. Subsequent time periods 2056-2085 and 2086-2115 are treated similarly.
2. Refer to Defra FCDPAG3 *Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts*, October 2006, for details of the derivation of this table. In particular, Annex A1 of this Note shows examples of how to calculate sea level rise.
3. Vertical movement of the land is incorporated in the table and does not need to be calculated separately.

B6. The rise in sea level will change the frequency of occurrence of high water levels relative to today's sea levels, assuming no change in storminess. There may also be secondary impacts such as changes in wave heights due to increased water depths, as well as possible changes in the frequency, duration and severity of storm events. A 10 per cent sensitivity allowance should be added to offshore wind speeds and wave heights by the 2080s.

B7. Extensive, low-lying coastal lands around most British estuaries are particularly susceptible to flooding. Changes to the drivers associated with coastal erosion (surges, waves, coastal sediment supply and morphology, and relative sea level rise) will affect the probability of flooding to new developments.

B8. The climate changes already seen in the UK are consistent with the UKCIP02 scenarios. This suggests that winters will become wetter over the whole of the UK, by as much as 20 per cent by the 2050s. A shift in the seasonal pattern of rainfall is also expected, with summers and autumn becoming much drier than at present. Snowfall amounts will

decrease significantly throughout the UK, but the number of rain-days and the average intensity of rainfall are expected to increase. Although average seasonal wind speeds could increase over most of the country, there is currently much less certainty regarding the potential for greater storminess and the consequences for sea surges or extreme wave activity on coasts.

B9. In making an assessment of the impacts of climate change on flooding from the land, rivers and sea as part of a flood risk assessment, the sensitivity ranges in Table B.2 may provide an appropriate precautionary response to the uncertainty about climate change impacts on rainfall intensities, river flow, wave height and wind speed.

Table B.2 Recommended national precautionary sensitivity ranges for peak rainfall intensities, peak river flows, offshore wind speeds and wave heights.

Parameter	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
Peak rainfall intensity	+5%	+10%	+20%	+30%
Peak river flow	+10%	+20%		
Offshore wind speed	+5%		+10%	
Extreme wave height	+5%		+10%	

Notes:

1. Refer to *Defra FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts, October 2006*, for details of the derivation of this table.
2. For deriving peak rainfall, for example, between 2025-2055 multiply the rainfall measurement (in mm/hour) by 10 per cent and between 2055-2085 multiply the rainfall measurement by 20 per cent. So, if there is a 10mm/hour event, for the 2025-2055 period this would equate to 11mm/hour; and for the 2055/2085 period, this would equate to 12mm/hour. Other parameters in Table B.2 are treated similarly.

B10. Sensitivity testing of the Flood Map produced by the Environment Agency, using the 20 per cent from 2025 to 2115 allowance for peak flows, suggests that changes in the extent of inundation are negligible in well-defined floodplains, but can be dramatic in very flat areas. However, changes in the depth of flooding under the same allowance will reduce the return period of a given flood. This means that a site currently located within a lower risk zone (eg Zone 2 in Table D.1, Annex D) could in future be re-classified as lying within a higher risk zone (eg Zone 3). This in turn could have implications for the type of development that is appropriate according to its vulnerability to flooding (see Table D.2, Annex D). It will therefore be important that developers, their advisors and local authorities refer to the current Flood Map and the SFRA when preparing and considering proposals.

B11. Flooding in estuaries may result from the combined effects of high river flows and high sea surges. When taking account of impacts of climate change in flood risk assessments covering tidal estuaries, it will be necessary for the allowances for sea level rise in Table B.1 (see para. B5) and the allowances for peak flow, wave height and wind speed in Table B.2 (see para. B9) should be combined.[17]

B12. Indirect impacts of climate change on land use and land management may change future flood risk. For example, changes in crop type, methods of cultivation and harvesting could affect the porosity and surface of the ground and hence the volume, speed and direction of storm run-off.

B13. Adaptation to climate change requires an integrated approach across different sectors including land use, water resources, transport, biodiversity and recreation. This integrated approach should be reflected in flood risk assessment.

B14. Knowledge and understanding of climate change is continuing to grow. The next UKCIP scenarios, due in 2008, are expected to provide more detail on regional climate changes and to express this information in probabilistic terms. Other areas where further research is in progress include climate-driven risks from groundwater and sewer flooding. The most up-to-date guidance on climate change and flooding from the Environment Agency, Defra, Communities and Local Government and the UKCIP should be considered in the preparation of Regional Flood Risk Appraisals, Strategic Flood Risk Assessments and site specific Flood Risk Assessments.

[17] Refer to Defra *FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts,* October 2006. Annex A2 gives details of joint probability analysis. www.defra.gov.uk/environ/fcd/pubs/pagn/climatechangeupdate.pdf