

Upton McGougan

LYONS HAULAGE
LITTLEHAMPTON

Flood Risk Assessment

for

Stuart Lyons

July 2010

Project No. 022.1832/RW/cf/92528



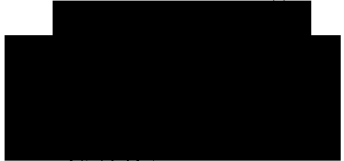
Upton McGougan Limited

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Revision History

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1.0 INTRODUCTION

- 1.1 Instructions were received from Savills in February 2010 to undertake a Flood Risk Assessment for the redevelopment of the current Lyons Haulage site and proceed with a residential development.
- 1.2 The request for a FRA is to support the planning application for the redevelopment of the site for residential use.
- 1.3 The EA has identified the site as falling within Flood Zone 1, lying outside the 1 in 1000 year floodplain. A copy of the indicative flood map (IFM) can be found in Appendix A.
- 1.4 In accordance with PPS25, the flood zones are described below :

- Zone 1 Low probability, less than 1 in 1,000 annual probability of flooding.
- Zone 2 Medium probability, between 1 in 100 and 1 in 1,000 annual probability of flooding.
- Zone 3 High probability, greater than 1 in 100 annual probability of flooding.

Table D.3²²: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability classification (see Table D.2)		Essential infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see Table D.1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception test required	✓	✓
	Zone 3a	Exception test required	✓	✗	Exception test required	✓
	Zone 3b 'Functional Floodplain'	Exception test required	✓	✗	✗	✗

Key

✓ Development is appropriate

✗ Development should not be permitted

-
- 1.5 All uses of land are appropriate in this zone. Residential development is classified as more vulnerable according to PPS25 and is acceptable within Flood Zone 1 subject to a thorough consideration of flood risks to the site and must not increase flood risk elsewhere. For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a FRA. This need only be brief unless the factors above or other local considerations require particular attention. This report sets out to respond to the statement and demonstrate that the development proposals are in compliance.
- 1.6 In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage techniques.
- 1.7 At the planning application stage, an appropriate FRA will be required to demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed now and taking climate change into account. Policies in LDDs should require FRAs to be submitted with planning applications in areas of flood risk identified in the plan.
- 1.8 Planning applications for development proposals of 1 hectare or greater in Flood Zone 1 and all proposals for new development located in Flood Zones 2 and 3 (see PPS 25 Table D.1 Annex D) should be accompanied by a FRA. This should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed, taking climate change into account.
- 1.9 For major developments in Flood Zone 1, the FRA should identify opportunities to reduce the probability and consequences of flooding. A FRA will also be required where the proposed development or change of use to a more vulnerable class may be subject to other sources of flooding (see PPS 25 Annex C) or where the Environment Agency, Internal Drainage Board and/or other bodies have indicated that there may be drainage problems.
- 1.10 Arun District Council have carried out a Strategic Flood Risk Assessment (SFRA) in February 2008, this document was primarily used to inform the district wide Local Development Framework (LDF) and demonstrates that the council can provide an evidence based and risk based approach when making planning decisions in line with PPS 25.
- 1.11 A copy of the Council Policy Statement on Flood and Coastal defence is included in Appendix B
-

2.0 THE SITE

- 2.1 The Site is located on the A259 Worthing Road Littlehampton between the recently completed Eden Park Development and the Body Shop Headquarters at Watersmead business park the site has an approximate area of 2.35 Ha
- 2.2 A topographical survey of the site has been undertaken and can be found in Appendix C. The survey shows that much of the existing development is hard paved. From the levels shown on the survey the site is generally falling towards the North East.
- 2.3 Sewerage records from Southern Water have been consulted. There are no surface water sewers in close proximity to the site.

3.0 SOURCES OF FLOODING

3.1 RIVER FLOODING

- 3.1.1 From the Environment Agency's Indicative Flood Map (IFM) (Appendix A) it is apparent that the source of flooding is potentially from the overland flood flow from the Black Ditch which is a tributary of the River Arun which is located approximately 2km to the east of the site.
- 3.1.2 The site has been identified as lying outside the 1 in 1000 year flood plain of River Arun as depicted on the IFM. This is classified as Flood Zone 1 in accordance with PPS25 and is described as the sites are having a less than 1 in 1000 annual probability of river flooding (< 0.1%) in any year.

3.2 PLUVIAL FLOOD FLOW FROM SURROUNDINGS

- 3.2.1 Pluvial flooding is defined as flooding that results from rainfall-generated overland flow, before the runoff enters any watercourse or sewer.
- 3.2.2 Upton McGougan Ltd have commissioned Sitecheck report from Landmark in connection with this site and the results of this are included in Appendix D
- 3.2.3 The pluvial flood maps indicate that for the 75 year, 100 year and 1000 year return period no pluvial flooding has been recorded on the site.
- 3.2.4 In addition to the above the above there have been no recorded insurance claims in respect of flooding in the surrounding area.

3.3 GROUNDWATER FLOODING

- 3.3.1 The BGS Geological Indicators of Flooding have been consulted (Appendix E). It is found that whilst part of the site is susceptible to flooding from groundwater. This should not pose a problem unless the new buildings are situated at the lowest part of the site or have basements.
- 3.3.2 It should be noted that the adjacent development wraps around the site from the west and to the north and no groundwater issues have been identified within that development.
- 3.3.3 A Full Site investigation has yet to be carried out. However at this stage there are no indications of any problems with High Groundwater or surface water discharges.

4.0 DEVELOPMENT PROPOSALS

- 4.1 It is proposed that the Lyons Haulage site be redeveloped, to provide a residential development comprising houses and apartments, with associated landscaping, car parking and access roads. A copy of the planning proposals can be found in Appendix F.
- 4.2 As a residential development, the proposals are classified as "More Vulnerable" in accordance with Table D2 of PPS25. However since the site is within Flood Zone 1 no special precautions are required.

5.0 FLOOD PROTECTION, MANAGEMENT AND MEANS OF ESCAPE

- 5.1 As it has been established that the site is not at risk from Pluvial, Tidal or Fluvial Flooding then no special flood protection is required.
- 5.2 SUDS will be introduced to manage surface runoff generated by the proposals.

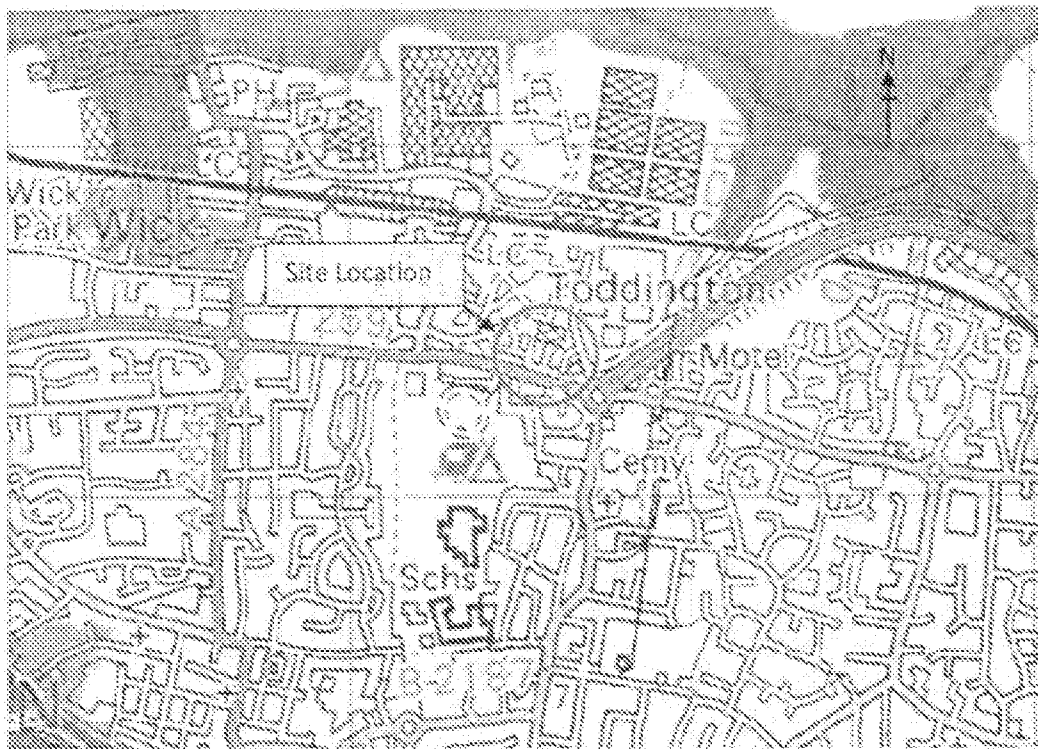
6.0 OFF SITE IMPACTS AND SUDS

- 6.1 A significant proportion (49%) of the existing development on site is impermeable. From the topographic survey this has been measured as 11595 m². The draft development proposals indicate a total surfaced area (including buildings) of 12185 m² (51%). With the exception of the buildings (4630 m²) and the road (4035 m²) the remaining area (1769.5 m²) can be constructed as permeable pavement. The resultant impermeable area will therefore be approximately 8665.5 m² (37%) Therefore the development proposals will result in a decrease in impermeable areas and hence a decrease in runoff generated by the site. It therefore follows that the proposed development will not increase flood risk elsewhere.
- 6.2 According to PPS25, SUDS devices are encouraged for new developments in order to reduce flood risk and improve runoff quality. It is therefore proposed that SUDS devices will be provided to enhance water treatment and ensure runoff is disposed of in accordance with current standards.
- 6.3 The majority of SUDS devices such as retention, wetland, detention and open channel techniques are precluded due to the limited site area. These techniques require high demand of land use and are therefore may be impracticable to the proposed site layout. The Green area in the middle of the site, however, could be used for a detention basin, combined with one or more infiltration devices.
- 6.4 It can, be seen that permeable paving fitted with a suitable outlet pipe or linked to an infiltration device should be applicable for this land use. The suitability of infiltration devices would need to be confirmed by site testing.
- It is anticipated that all surface water from roofs and hard paved areas can be collected within permeable paving sub-base. This can then be discharged into infiltration devices or public sewerage.
- 6.5 "Pollution Prevention Guideline" PPG 3 (Environment Agency, April 2006) states that: "Techniques that control pollution close to the source, such as permeable surfaces or infiltration trenches, can offer a suitable means of treatment for runoff from low risk areas such as roofs, car parks, and nonoperational areas." Permeable paving will intercept sediment and oil on surface providing pre-treatment to prevent clogging of the pavement; the oil will be further biodegraded within the granular media of the pavement. This should be considered to be adequate for casual carpark and residential roads as per the requirements suggested in the SUDS Manual.
- 6.6 The adoptable road areas could utilise permeable pavement systems subject to approval from the highway authority. Should the highway authority be reluctant to accept the permeable pavement, the run-off could be discharged into suitable infiltration devices located within the green open space areas.

7.0 CONCLUSIONS AND RECOMMENDATIONS

- 7.1 A significant proportion of the existing development on site is impermeable. Therefore by use of permeable pavements the development proposals will result in a decrease in impermeable areas and hence a decrease in runoff generated by the site. It therefore follows that the proposed development will not increase flood risk elsewhere.
- 7.2 SUDS drainage techniques can be used to both reduce the quantity and improve the quality of the new discharges from the site.
- 7.3 As the site is not in an area susceptible to Pluvial, Tidal or Fluvial Flooding there is minimal risk to the proposed development.

APPENDIX A
EA FLOOD MAP



EA Flood Map

APPENDIX B

ARUN DISTRICT COUNCIL POLICY STATEMENT ON FLOOD AND COASTAL

ARUN DISTRICT COUNCIL

POLICY STATEMENT ON FLOOD AND COASTAL DEFENCE

12 January 2004

1.0 INTRODUCTION

This is an update to the existing policy statement which was prepared by Arun District Council to provide a public statement of the Council's approach to flood and coastal defence in its area.

- 1.2 The Department of Environment, Food and Rural Affairs [Defra] has policy responsibility for flood and coastal defence in England. However, delivery is the responsibility of a number of flood and coastal defence "operating authorities" i.e. the Environment Agency, local authorities and internal drainage boards. Responsibilities differ according to the type of operating authority and Arun District Council's responsibilities are set out in paragraphs 3.1 and 3.2 below.

- 1.3 The Government has published a policy aim and three objectives for flood and coastal defence¹. To ensure a more certain delivery of the aim and objectives by the individual operating authorities the Government has published a series of high level targets². The first target requires each operating authority to publish a policy statement setting out their plans for delivering the Government's policy aim and objectives in their area. This will include their assessment of flooding and coastal erosion risk in their area, and the plans for reducing or managing that risk.

- 1.4 This policy statement fulfils that requirement. Copies are also available from the Council's Arun Civic Centre offices in Maltravers Road, Littlehampton, West Sussex BN17 5LF and on the Internet at www.arun.gov.uk. The Council is also providing a copy to:

- the Department of Environment, Food and Rural Affairs;
- the Office of the Deputy Prime Minister; and
- the Environment Agency (also as the Internal Drainage Board)

2.0 HOW THE COUNCIL WILL DELIVER THE GOVERNMENT'S POLICY AIM AND OBJECTIVES

- 2.1 Arun District Council acknowledges and supports the Government's aim and objectives for flood and coastal defence (as set out below). Our policy and approach will be consistent with them, as follows:

Government's policy aim:

To reduce the risk to people and the developed and natural environment from flooding and coastal erosion by encouraging the provision of technically, environmentally and economically sound and sustainable defence measures.

Section 3 below sets out our plans for reducing or managing the risk of flooding and coastal erosion risk in the Council's area.

Objective (a):

To encourage the provision of adequate and cost effective flood warning systems.

Provision of flood warning systems is the responsibility of the Environment Agency. However, Arun District Council recognises its related and important role in emergency planning and response. We will therefore:

- ensure that our emergency response plans include appropriate arrangements for flooding emergencies and that such plans are reviewed, in consultation with the Environment Agency, at least every two years;
- maintain an awareness of the Environment Agency's flood warning dissemination plan for our area and contribute to its implementation as necessary; and
- play an agreed role in any flood warning emergency exercises organised by the Environment Agency covering our area.

Objective (b):

To encourage the provision of adequate, economically, technically and environmentally sound and sustainable flood and coastal defence measures.

Arun District Council will:

- provide an adequate, economically, technically and environmentally sound approach to providing the flood and coastal defence service. We will:
 - adopt a strategic approach to provision of flood and coastal defences, particularly by assessing any potentially wider effects of proposed defences. To this end we will continue to play a full role in Shoreline Management Plans (SMPs), Coastal Defence Strategies and Local Environment Agency Plans, for our area;
 - aim to provide sustainable flood and coastal defences which provide social and/or economic benefits to people whilst taking account of natural processes and which avoid committing future generations to inappropriate defence policies and options;

- ◊ ensure work is carried out in accordance with best practice and to deliver best value for money including (a) keeping up-to-date with policy and technical developments in flood and coastal defence, in particular by reference to Defra guidance, other Government publications and relevant technical manuals; (b) consulting the Environment Agency on flood defence options to ensure that best practice is adopted and shared; and (c) using appropriately qualified and experienced experts to advise on analysis and design of works or programmes of management;
- ◊ consider alternative approaches to funding, such as Public Private Partnerships;
- ◊ where appropriate seek contributions from developers or other direct beneficiaries of works, in accordance with Planning Policy Guidance Note 25;
- ◊ ensure that appropriate maintenance regimes are in place for flood and coastal defences for which the Council takes responsibility;
- ◊ inform landowners of what responsibilities for maintenance rest with them (see paragraph 3.1 below);
- ◊ make publicly available the Council's expenditure plans for flood and coastal defence maintenance and capital works this will be reported through "Coast Protection Reviews" to the Council's Cabinet annually.
- play a positive role in fulfilling our statutory and other responsibilities for furthering nature conservation, including achievement of the Government's environmental obligations and targets. In particular we will:
 - ◊ fulfil our responsibilities in relation to nationally and internationally important conservation areas, under the Wildlife and Countryside Act 1981 and as a competent authority under the terms of the Conservation (Natural Habitats, etc.) Regulations 1994. The Council has set out its Biodiversity Plan which was approved by the EP & C Committee on 27th October 1999. The Council has also made a commitment to meet the requirements of Defra High Level Targets in this respect.
 - ◊ co-operate with English Nature and the Environment Agency in completing and implementing Coastal Habitat Management Plans (CHaMPs) covering our area, drawing on English Nature/Environment Agency guidance for plan production;
 - ◊ when carrying out flood and coastal defence works, seek opportunities for environmental enhancement, and aim to avoid damage to environmental interest and to ensure no net loss to habitats covered by Biodiversity Action Plans. We will monitor all losses and gains of such habitats as a result of

these operations and report on them annually to the Environment Agency, and

- o ensure that, for those Water Level Management Plans where we are the lead operating authority, we work in partnership with English Nature to complete, implement and review Plans in accordance with Defra guidance on plan completion and the timetables set out in Defra High Level Targets.

Objective (c):

To discourage inappropriate development in areas at risk from flooding and coastal erosion.

As the local planning authority for our area, Arun District Council will take account of flooding and coastal erosion risks in all matters relating to development control, including development plans and individual planning applications, in accordance with Planning Policy Guidance Notes 20 and 25.

3.0 OUR ASSESSMENT OF THE RISK OF FLOODING AND COASTAL EROSION IN OUR AREA AND WHAT WE WILL DO TO REDUCE OR MANAGE THAT RISK

Flood and coastal defence responsibilities

- 3.1 Apart from certain obligations to protect internationally important habitats under the EU Habitats Directive, all flood and coastal defence works are undertaken under permissive powers. This means that operating authorities, such as Arun District Council, are not obliged to carry out flood and coastal defence works. It is also important to note that the Council does not normally accept responsibility for maintenance of flood defences on private land; this is the responsibility of the landowner.
- 3.2 Arun District Council is the relevant operating authority for:
 - flood defences on ordinary watercourses which are not within the area of an internal drainage board, and
 - coast protection responsibility (ie measures against coastal erosion) for all frontages on the authority's 23.36km shoreline, with direct responsibility for 15.4km of that frontage. The Council has entered into agreement with a number of private frontages to undertake maintenance responsibility for coastal defences. Further details of the Council's responsibility can be obtained from the Council's Solicitor
- 3.3 The flood and coastal defences that are owned or managed by the Council are detailed in the Council's database which is also provided to the Environment Agency.

- 3.4 The Environment Agency is the relevant operating authority for flood defences on designated main rivers. Culverts under roads are generally the responsibility of the relevant Highways Authority (West Sussex County Council or The Highways Agency).

Assessment of flood risk

- 3.5 There are a considerable number of ordinary watercourses for which the Arun District Council is the relevant operating Authority, these have not all been identified. Records exist of many of the ordinary watercourses which have been inspected and the Council has undertaken works as necessary to mitigate flooding incidents. Those watercourses that are designated as main river are the responsibility of the Environment Agency and are shown more particularly on maps available for inspection at the Environment Agency Offices. There are three internal drainage boards operating in the Council's area; the Environment Agency acts as internal drainage board for these three areas, the boundaries of which are shown on the Environment Agency Planning Consultation Map.
- 3.6 We have agreed with the Environment Agency the location of a number of "critical ordinary watercourses" within the Council's area (these are watercourses which are not classified as "main river" but which the Council has agreed with the Environment Agency to be critical because they have the potential to put at risk from flooding large numbers of people and property). A map showing these "critical ordinary watercourses" is available for inspection at the Council's offices (address as para 1.4) during normal working hours.
- 3.7 Based on historical flooding information, coupled with the Environment Agency's indicative flood plain maps, the Council has carried out an assessment of the risk of flooding from the ordinary watercourses in our area.

The main areas at risk of flooding, are the areas of flooding concern which exist within the District boundaries but are not its direct responsibility, these are scheduled below. The Council is satisfied that there are minimal risks to human life created by these flood risks from ordinary watercourses, but emphasises the need for the Environment Agency's flood warnings to be heeded, where these are provided (see below).

- A29 Lidsey Farm junction, Sack Lane/Shripney Road
- Nyton Road, Junction A29 Westergate/Northfields Lane off Nyton Road
- Watercourses above Barnham Rife from Barnham Lane North East to Walberton
- Watercourses above Yapton Rife, Yapton Road
- Felpham Way, Felpham
- Ancion Lane, Ancion

- Horsemere Green Lane, Climping
- Water Lane, Angmering Village
- Craigwell Estate, Aldwick

Action to reduce or manage flood risks

- 3.8 The main means by which flood risks will be managed is through the Environment Agency's Local Flood Warning Plan (West Sussex) of December 2003. This makes arrangements for warnings to be provided in coastal and Main River areas within this Council's area, including individual warnings to high risk properties. The Environment Agency hold plans and can advise on areas of risk. Arun District Council has included plans for responding to both major and minor flooding in its emergency planning procedures and has arrangements for cascading warnings received from the Environment Agency to relevant Council services.
- 3.9 The Council has a programme in place to inspect the state of:
- grills at the entrance/exit of culverts at five locations weekly between October and March each year
 - all critical ordinary watercourses and related culverts;
 - the Council does not inspect all ordinary watercourses annually.
- 3.10 The Council has an annual maintenance programme for the flood defences and channels which it owns, or for which it accepts responsibility, so that they operate at optimum efficiency. Where the responsibility for maintenance rests with a landowner, the Council will aim to secure co-operation in ensuring appropriate maintenance takes place, drawing on enforcement powers if necessary.
- 3.11 The Council does not currently have any major capital flood alleviation works planned.
- 3.12 By following Government guidance in Planning Policy Guidance Note 25 on development in flood risk areas, the Council, acting as a local planning authority, will ensure that risks are further minimised. This includes measures for ensuring sustainable urban drainage systems to control surface water run off.

Assessment of coastal erosion risks

- 3.13 As identified in the 1997 Shoreline Management Plan, of 23.36km shoreline 15km is defended against erosion and is the Council's direct responsibility. 2km consists of natural shingle bank (0.4km of this being the Council's direct responsibility and the remaining 1.6km being private).
- 3.14 Risks of erosion of the defended frontage is low although this depends upon the continued maintenance of the defences, without defences there would be

a potential average erosion rate of 1-2 metres per year. Elsewhere on the undefended coast, potential erosion rates are close to zero or negative (see 1997 SMP for details).

Action to reduce or manage coastal erosion risks

- 3.15 The Council is an active partner in the Southeast Regional Monitoring Programme. Routine beach management for the protected frontage consists of annual reprofiling where necessary and occasional recharge, all as indicated in the Coastal Defence Strategies as adopted by the Council and agreed or pending agreement by Defra. Specific Beach Management Plans will be developed for frontages at Pagham/Aldwick, Felpham, Elmer and Climping over the next four years. Our management regime takes into account the most recent predictions of the impacts of climate change as set out in the 1997 SMP and the Coastal Defence Strategies:-

Pagham to east Head (Draft 1999)

Arun to Adur (June 2000)

Arun to Pagham (January 2004)

4.0 PARTNERSHIPS AND REVIEW OF THIS POLICY STATEMENT

- 4.1 The Council has set out its policy and approach to flood and coastal defence and has recognised the need to work in partnership with central Government and other operating authorities including the Environment Agency. The Council's stakeholders also have an important part to play, in recognising the vital importance of watercourses in controlling flood risk and the need to avoid blockages, whether by not dumping rubbish or obstructing flows in other ways. We ask members of the public to let us know of any problems which might increase the risk of flooding and/or coastal erosion.
- 4.2 Arun District Council intends to review this policy statement in three years' time, when it will be revised and reissued as necessary. Meanwhile, the Council welcomes any comments on the approach and policies set out in this statement.
- 4.3 It is intended that this Policy Statement will be a working document and that continued monitoring and amendments will be made should flood risk areas be identified during the period before review in three years time.

References

- ¹ Strategy for Flood and Coastal Defence in England and Wales
MAFF and Welsh Office, September 1993

² High Level Targets for Flood and Coastal Defence Operating Authorities and Elaboration of the Environment Agency's Flood Defence Supervisory Duty
MAFF, November 1999

Shoreline Management Plan July 1997

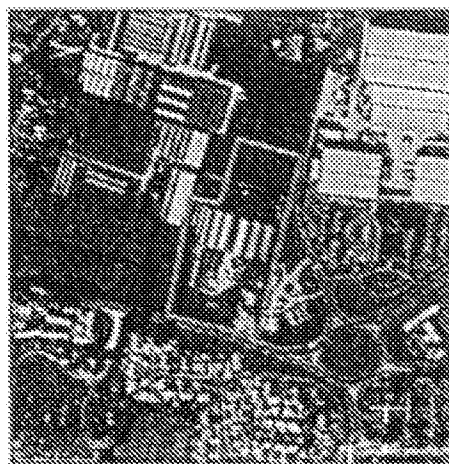
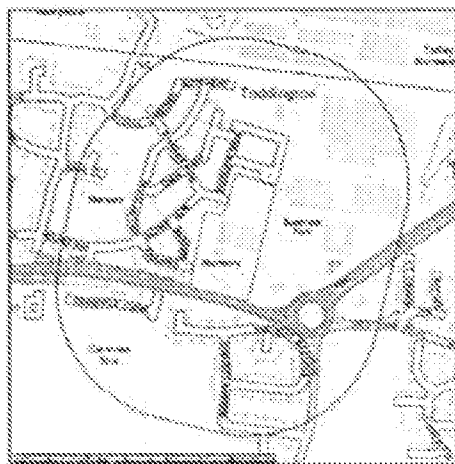
Coastal Defence Strategies

- Rivers Arun to Adur
- River Arun to Pagham
- Pagham to East Head

APPENDIX D
SITECHECK RESULTS

Windroos, Worthing Road, Wick, LITTLEHAMPTON, BN17 6LY**Prepared for:**

Mr M Thomas
Opton McGougan plc
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Moorside Road
Winchester
Hampshire
SO23 7RX

Report reference: SCF_30381020_1_1**Report Date:** 03-MAR-2010**Customer Reference:** 6221852**National Grid Reference:** 603810 103400**Site Area:** 23027 m²

If you have any questions on the contents of this Report please contact Landmark Customer Helpdesk which is open from 9.00am - 5.30pm, Monday - Friday, via one of the following channels:

Telephone: 0844 844 9888
Fax: 0844 844 9889
Email: info@landmarkinfo.co.uk
Website: www.sitecheck.co.uk

Flood Risk Assessment

Low Moderate High

Overall Assessment



RPS would consider that the site is at a LOW risk of tidal and/or fluvial flooding but may still be prone to flooding from other sources.

Tidal / Fluvial

No significant flood risks identified.

Groundwater

Appraisal

The site has been identified in an area potentially vulnerable to groundwater flooding. However, unless the building is located at the lowest part of the site or has basement structures, this is unlikely to pose a significant risk.

Development Advice

The site is located on geological deposits likely to contain shallow or perched groundwater. These deposits may provide development constraints, either with regard to permanent underground structures such as basements or temporary construction features such as excavations. Shallow groundwater may also limit the potential for soakaway based sustainable urban drainage systems.

Surface Water and Surcharging

Development Advice

Whilst the site is located outside the EA's identified flood zones based on the site being greater than 1 hectare in size a full flood risk assessment would be needed to support any planning application for redevelopment of the site. This assessment would principally need to address surface water management issues, but would also need to consider all sources of flooding and is intended to prevent any proposed development from increasing off site flood risk.

The site is located outside the EA's identified flood zones, however, the site may still be prone to other forms of flooding such as surface water, pluvial or surcharging of drains.

Pluvial

No significant flood risks identified.

Reliance

Reliance of this report is permitted for a named lender and/or a third party for up to six months from the date it was produced. Please see the notes at the back of this report for more details.

Any further work undertaken by RPS will be carried out under RPS Standard Terms and Conditions.

Services

If you require RPS to carry out any work on your behalf, please fax confirmation on 020 7528 0708 or email to SitecheckFlood@rpsgroup.com.

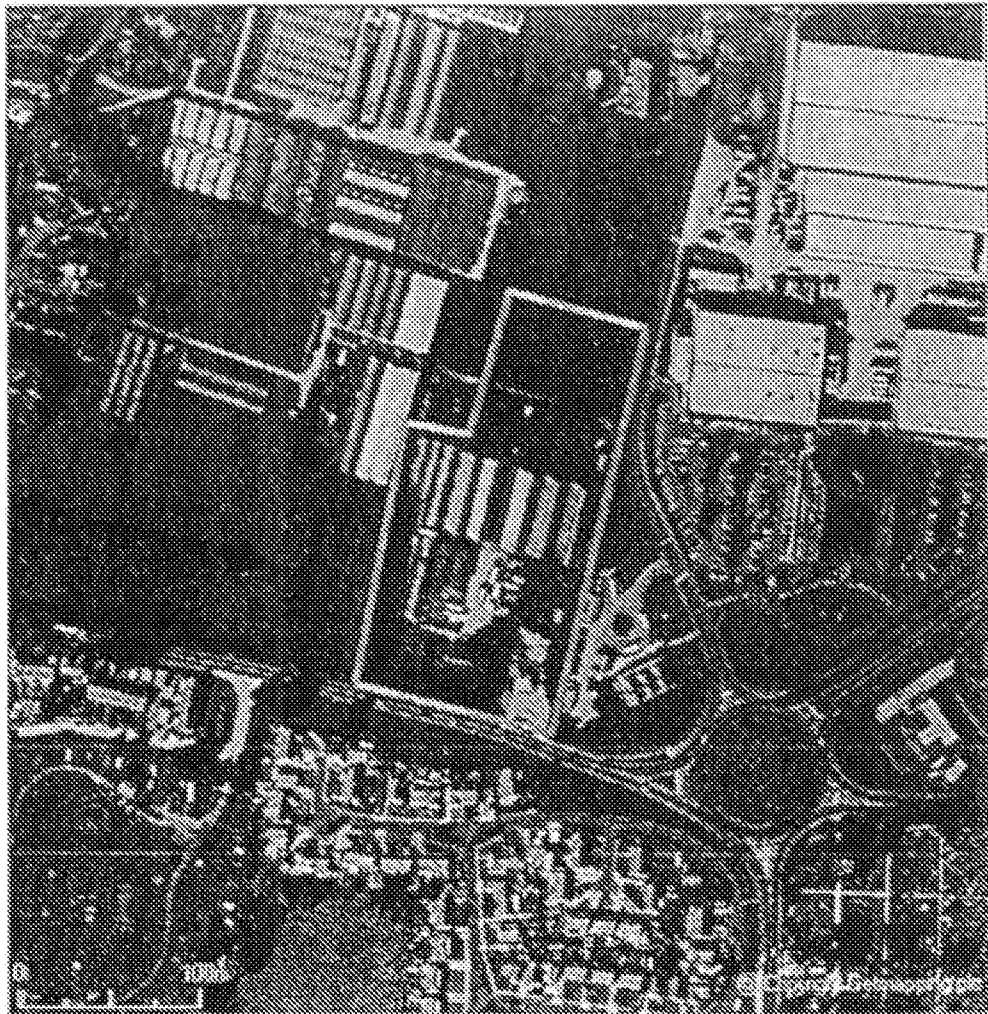
RPS can assist with any potential further work highlighted in the assessment. Following a review of any further information it may be practicable to revise the risk assessment of the site in context with the current and proposed site use. A separate letter/report would be produced to confirm the updated professional opinion. Any additional fees would be agreed prior to undertaking the work.

Should you require any further information on this report, please contact Sitecheck Customer Services on 0844 844 9966 or the RPS Commercial Advice line on 020 7261 1091.

Completed by:
RPS Environmental Risk Team

The RPS Risk Assessment is based only on the information as shown by data sources collected by Landmark Information Group Ltd and supplied within the associated Sitecheck Flood Report with RPS Risk Assessment including further information provided by the client. The RPS Risk Assessment should be read in conjunction with the Guidance Notes and the Sitecheck Flood Report. No responsibility can be accepted for any error or omissions in the data supplied to RPS. No physical inspection of the property has been carried out. The RPS Risk Assessment is subject to the Landmark Terms and Conditions.

Report Sections and Details	Page
Aerial Photo	1
The aerial photo gives an overall view of the area. The smaller large-scale Ordnance Survey map includes the site boundary and search zone buffer at 250m.	
Location Map	2
The accurate large-scale Ordnance Survey map confirms the boundary of the subject site. The descriptive text may identify other features which could be of relevance but not reported. The smaller aerial photo includes the site boundary.	
Summary Table	3
This section comprises of a summary table of the information found on site and in its vicinity.	
RMS Flooding	4
This section contains the Risk Management Solutions flood data. The data is based upon the likelihood of a flood occurrence for 3 flood return periods; these being 75 years, 100 years and 1000 years. Each return period can detail both defended and/or undefended flood features, with each feature also reporting an associated flood depth. In addition pluvial flood features are also detailed where applicable, however tidal flooding is not included.	
EA Flooding	9
This section gives details of EA Flooding data which includes extent of flooding or extreme flooding, flood defences and areas benefiting from flood defences. If EA Flood Zones are in the vicinity of the property, then an EA Flood Map is included within this section.	
BGS Flooding	10
This section details BGS Groundwater Flooding data and vulnerability to inland or coastal flooding.	
Insurance Risk Rating	13
This section gives an indication of the level of flood risk for the property as identified by Norwich Union, as well as an indication of the insurance claims rating for flooding within the postcode sector.	
Guidance Notes for the Practitioner	14
This section gives guidance on the purpose, methodology and scope of the RPS Flood Risk Assessment.	
Useful Information	16
This section contains information which may be of use when interpreting the report.	
Useful Contacts	18
All textual information is linked by the 'Contact Ref' to this quick reference list of contacts. These contacts may be able to supply additional information or answer any subsequent query relating to that record.	



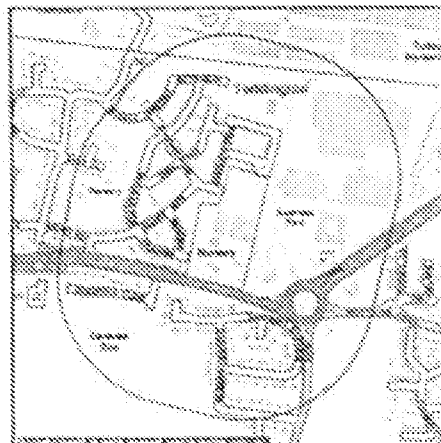
Site
Wimpross, Woking Road, WICK, LITTLEHAMPTON, BN17 6LY

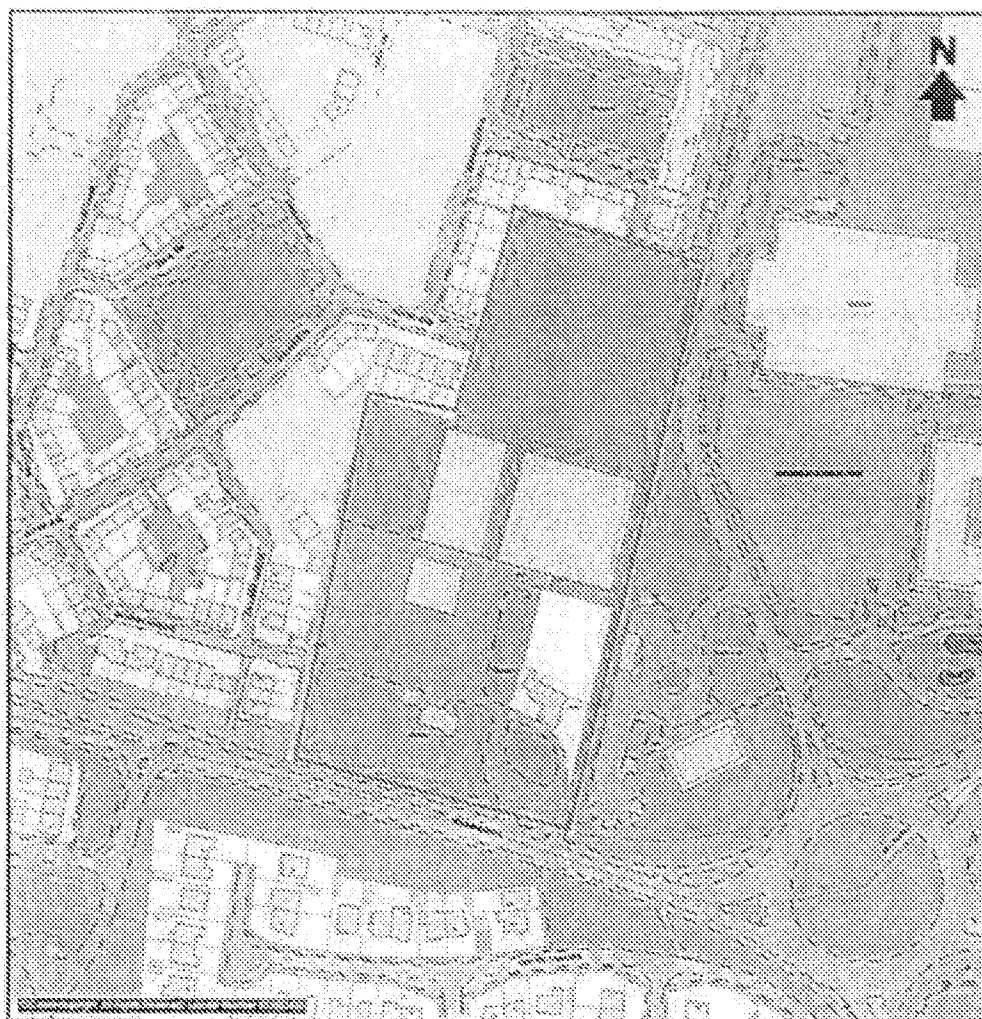
Grid Reference
503610, 103450

Report Reference
SCF_20381020_1_1

Customer Reference
002 1830

Size of Site
23627 m²





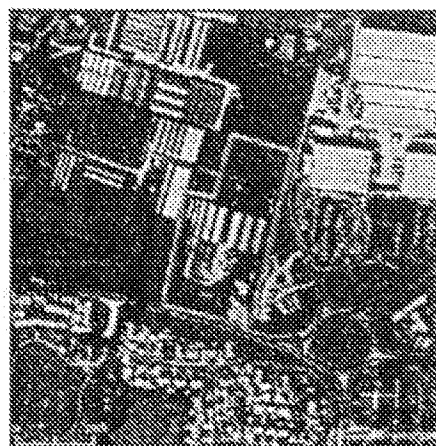
Site
Windres/Worthing Road, Wick, LITTLE HAMPTON, BN17 6LY

Grid Reference
903610, 103456

Report Reference
SCF_30381009_1_1

Customer Reference
002-1932

Size of Site
23227 m²



RMS Flood Risk	On Site	0-250m
	0	18
RMS Flooding		
RMS 75 year Flood Return	0	8
RMS 100 year Flood Return	0	7
RMS 1000 year Flood Return	0	5

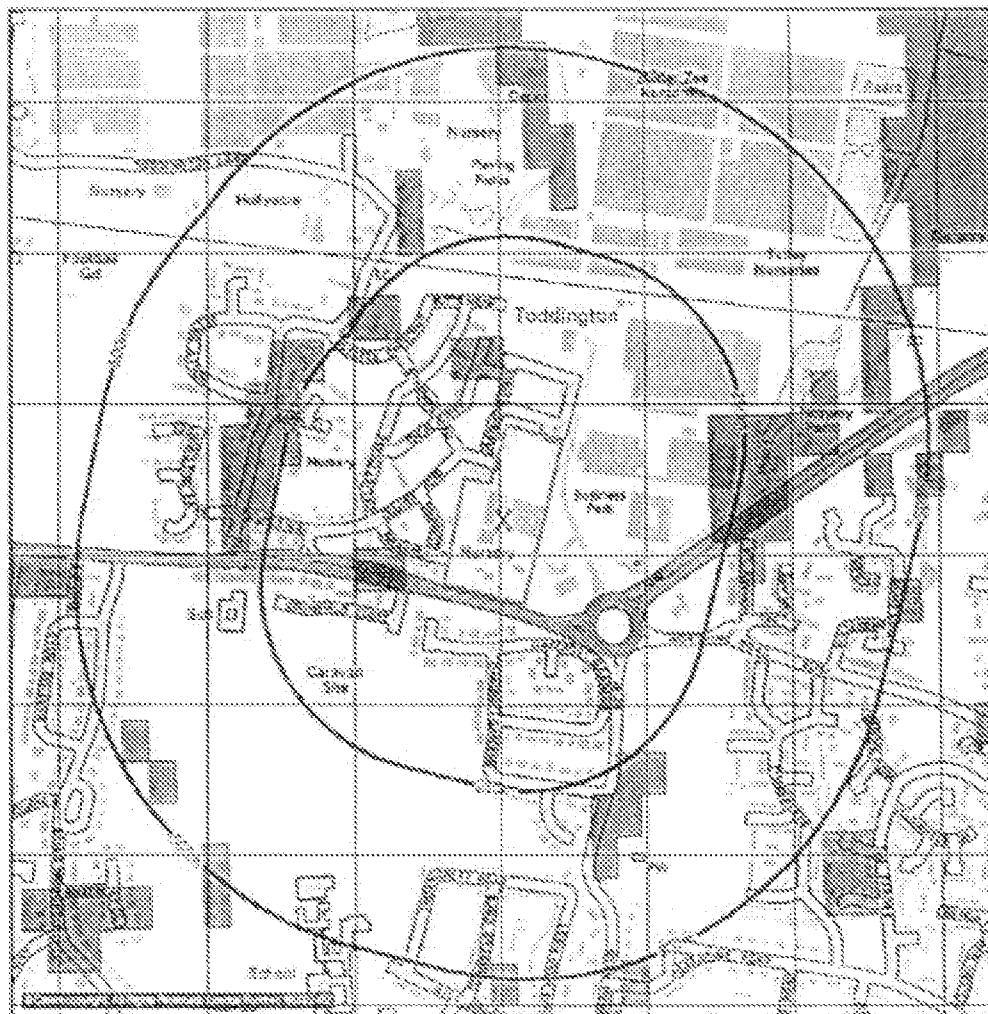
Environment Agency Flood Risk	On Site	0-250m
	0	0
EA Flooding		
Extreme Flooding from Rivers or Sea without Defences	0	0
Flooding from Rivers or Sea without Defences	0	0
Areas Benefiting from Flood Defences	0	0
Flood Water Storage Areas	0	0
Flood Defences	0	0

British Geological Survey Flood Risk	On Site	0-50m
	1	0
BGS Flooding		
BGS Groundwater Flooding Susceptibility	1	0
BGS Geological Indicators of Flooding	0	0

NU Flood Risk Rating	On Site
	1
NU Flood Risk	
Property-based Flood Risk	1

Insurance Claims Rating	On Site
	1
Insurance Claims	
Postcode Sector Insurance Claim Ratings - Flood	1

75 Year Return Period



General	Flood Depth (mm)	Defended Flood	Un defended Flood	Partial Flood (flood depth, etc)
Site Boundary	9-300	☐	☐	☐
Search Buffer	20-500	☐	☐	
Warning Reference Point	50-1000	☐	☐	
Reference Boundary	200+	☐	☐	

General	Flood Depth (mm)	Defended Flood	Un defended Flood	Partial Flood (flood depth risk)
☒ Sea Boundary	6-200	☒	☐	☒
☒ Beach dune	20-1000	☐	☒	
☒ Existing Reference Point	20-1000	☒	☐	
☐ Reference Number	200+	☒	☐	

[illegible]

General	Flood (Depth: mm)	Extended Flood	Unextended Flood	Pluvial Flood (Flood depth: s/s)
☐ Site Security	0-20	☒	☐	☒
☐ Access Buffer	20-50	☐	☐	
☐ Access Reference Point	50-100	☒	☐	
☐ Reference Number	100+	☐	☐	

RMS Flood Risk		Ref No.	Search Buffer	Direction
RMS Flooding				
RMS 75 year Flood Return				
Flood Type / Depth: Flood Hazard:	75 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	W
Flood Type / Depth: Flood Hazard:	75 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	N
Flood Type / Depth: Flood Hazard:	75 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	NW
Flood Type / Depth: Flood Hazard:	75 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	E
Flood Type / Depth: Flood Hazard:	75 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	W
Flood Type / Depth: Flood Hazard:	75 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	SE
RMS 100 year Flood Return				
Flood Type / Depth: Flood Hazard:	100 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	SW
Flood Type / Depth: Flood Hazard:	100 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	W
Flood Type / Depth: Flood Hazard:	100 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	N
Flood Type / Depth: Flood Hazard:	100 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	E
Flood Type / Depth: Flood Hazard:	100 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	S
Flood Type / Depth: Flood Hazard:	100 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	SE
Flood Type / Depth: Flood Hazard:	100 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	N
RMS 1000 year Flood Return				
Flood Type / Depth: Flood Hazard:	1000 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	SW
Flood Type / Depth: Flood Hazard:	1000 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	W
Flood Type / Depth: Flood Hazard:	1000 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	N
Flood Type / Depth: Flood Hazard:	1000 year pluvial flood, depth is not applicable Pluvial Flood Risk	-	0-250m	S

RMS Flood Risk		Ref No.	Search Buffer	Direction
RMS Flooding				
RMS 1000 year Flood Return				
Flood Type / Depth:	1000 year pluvial flood, depth is not applicable	-	0-250m	N
Flood Hazard:	Partial Flood Risk			



General		Area of Floodplain	
☐ Site Boundary	☐ Areas Bounding Low Flood Defences	☒ Extreme Flooding from Rivers or Sea without Defences (Zone 1)	
☐ Stream Border	☐ Flood Water Storage Areas	☒ Flooding from Rivers or Sea without Defences (Zone 2)	
☐ Sealing Defences Point	☐ Flood Defences		
☐ Reference Number			

General	SSZ Groundwater Flooding Susceptibility
☒ Site Boundary	☒ High Susceptibility
☒ Seasonal Flooding	☒ Moderately High Susceptibility
☒ Existing Reference Point	☒ Moderate Susceptibility
☒ Reference Marker	☐ Low Susceptibility
	☐ Negligible Susceptibility

- ☐ **General**
- ☐ **Site Neurons**
- ☐ **Search Author**
- ☐ **Seeing Parameters from**
- ☐ **Reference Equation**
- ☒ **Ecological Indicators of Flooding**
- ☐ **Events**
- ☐ **Sound**
- ☐ **Studies of Water**

British Geological Survey Flood Risk		Ref No.	Search Buffer	Direction
BGS Flooding				
BGS Groundwater Flooding Susceptibility				
Flooding Type:	Moderately High Susceptibility to Groundwater Flooding	-	On Site	E
Contact:	3			

NU Flood Risk Rating		Ref No.	Search Buffer	Direction
NU Flood Risk				
Property-based Flood Risk				
Flood Risk Rating: Contact:	Negligible Flood Risk Rating 4	-	On Site	S

Insurance Claims Rating		Ref No.	Search Buffer	Direction
Insurance Claims				
Postcode Sector Insurance Claim Ratings - Flood				
Insurance Rating: Postcode Sector: Contact:	Very Low Flood Insurance Claim Rating - No Recorded Claims BN17 5 4	-	On Site	N

RPS

RPS Consultants Ltd (RPS) is part of the RPS Group plc, the largest European Environmental Consultancy with over 4,500 staff and a network of offices throughout the UK, Europe and key offices worldwide. As a leading advisor to the financial and property sector on potential environmental liabilities it has over thirty years experience advising on contaminated and 'brownfield' sites in the UK, and acts as a panel advisor to the majority of the UK's clearing banks, property developers/agents and the legal profession.

The expertise of RPS staff together with the company's in-depth knowledge and experience in the marketplace can help you find economic solutions for even the most difficult sites.

Purpose of the Assessment

The purpose of the RPS Risk Assessment is to assist parties involved in property transactions in assessing the risk of flooding based on the factual data presented by Landmark in this report. It provides structured guidance and advice on the interpretation of numerous sources of flood-related data, the potential for flooding and details on the significance of flood risk; both in the context of sites which remain in their current use and in any redevelopment / planning scenario.

The client also has access to a technical helpline offering free initial advice and consultation by the RPS panel of consultants who provide the assessments.

Overall, RPS aims to provide clear, concise and commercially-focused advice to facilitate property transactions and also assist with necessary guidance in planning and redevelopment scenarios.

RPS Risk Assessment Methodology and Scope

In summary, the factual data provided by Landmark are passed through a specialist risk model and, where appropriate, a manual review and assessment is completed by a dedicated panel of specialist consultants. A professional opinion of the flood risk is subsequently reported.

The RPS Risk Assessment is based on the site boundary defined by the client and data contained within this report.

The bespoke risk model has been designed by RPS' flood risk team. The model takes into account the risk directly associated with fluvial (river), tidal (coastal), pluvial (rainfall ponding / surface water) and groundwater flooding.

Datasets used in the RPS risk model include the following:

1. Environment Agency flood data (1:20,000 scale);
2. British Geological Survey - geological maps (1:10,000 scale);
3. BGS - Geological Indicators of flooding (electronic data set); and
4. RMS - Pluvial flooding dataset.

Where a sufficient level of potential risk is identified, the report is automatically forwarded to the RPS team of flood risk consultants for a detailed review and manual assessment i.e. non-automated. The outcome of the review and assessment is the provision of a flood risk rating and site-specific explanations of the level of risk. Guidance is also provided in relation to potential development of the site.

The resulting professional opinion enables the qualification of the level of flood risk at the site. Should further work be advised, RPS provides advice and direction to reduce or further clarify the risk. RPS can, on request, also provide a detailed scope of work and associated costs for any further work required (where considered necessary).

RPS Risk Ratings

The classes of risk referred to within the RPS Risk Assessment take into account the type, extent and likely frequency of flooding on the site. The risk ratings can be generally defined as follows:

Low Risk - it is considered unlikely that significant flooding will occur at the site.

Moderate Risk - whilst the potential for flooding has been identified at the site, it either relates to a small part of the site only (particularly significant for larger areas) or it is not considered to be of extreme depth or high frequency.

High Risk - there is the potential for significant flooding at the site. This may include regular shallow flooding or less frequent flooding to significant depths with potential to disrupt site operations or impact development opportunities.

Limits of the Report

The RPS Risk Assessment comments upon the potential risk of significant flooding and is made solely on the basis of information presented in the Sitecheck Flood report. There are a number of forms of flooding not included in the presented data sets and as such are not included in the RPS assessment. These include, but are not limited to, flooding from sewers, burst water mains and flooding from other surface water bodies such as reservoirs, lakes and canals. An assessment of drainage suitability is not included. Potential off site impacts such as restricted access due to flooding in the vicinity of the site are also not included within the assessment.

The assessment does not include any physical inspection of the site or condition of the land. Direct requests for site-specific

records from regulators (i.e. the Environment Agency) have been undertaken.

The RPS assessment is not intended to provide a sufficient level of detail to fully comply with the requirements of flood risk assessments as detailed in Planning Policy Statement 25 'Development and Flood Risk' (PPS25) and advice should be sought as to what additional assessment is required to accompany planning applications for any development work which may be planned on the site. PPS25 was published by the Department of Communities and Local Government (DCLG) in December 2009. This document, along with its companion Practice Guide, provides central government's guidance on how flood risk issues should be dealt with for different types of development during the planning process.

If you have any queries regarding the information in this report and how to use it, please do not hesitate to contact the Sitecheck Helpdesk (see Contact Details below).

Other Environmental Issues

Should there be other environmental issues at the site e.g. ground contamination, geotechnical, or for energy / sustainability appraisals, please contact RPS for further free advice. RPS can provide the necessary additional services to ensure environmental issues placed in an appropriate commercial context to assist in transactions going forward.

Contact Information

For queries regarding the contents of the Report, please contact the Sitecheck Customer Helpdesk on 0844 844 9668.

For further information regarding the RPS flood risk assessment itself, or for general consultancy advice concerning property and environmental liability, please contact RPS on 020 7261 1091.

Flooding

The Sitecheck report flood map plots all flood related features revealed within the search area as supplied by the relevant agency. However, to avoid confusion, the text entry in the body of the report only reveals the detail of the nearest feature in each flood data set. This is also reflected in the summary table where only a single entry is included to indicate the search buffer of the nearest occurrence.

RMS Flooding Data

RMS flood data is based on analyses of historical data, using mathematical and statistical models and the encoded experience of scientists and engineers, and is inherently imprecise. It is provided "AS IS", without any warranty of any kind. The information provided is not intended to constitute professional advice or an endorsement by RMS of any kind regarding the use and suitability of the information. You rely on this information solely at your own risk. RMS shall not be liable for any damages (whether direct or consequential damages, including loss of profits) suffered by any recipient of this report or any third party relying upon or using this report. Please refer to the report user guide for further information.

EA Data

Extent of Flooding

The information given in England and Wales is based on the Environment Agency's Flood Map, specifically the extent of flooding. This shows flooding from rivers or sea without defences (i.e. the natural flood plain area that could be affected in the event of flooding from rivers and the sea. An area affected by extreme flooding (Zone 2) indicates the extent of a flood with a 0.1% (1 in 1000) chance of happening each year.

Extent of Extreme Flooding

The information given in England and Wales is based on the Environment Agency's Flood Map, specifically the extent of flooding. This shows flooding from rivers or sea without defences (i.e. the natural flood plain area that could be affected in the event of flooding from rivers and the sea. An area affected by flooding (Zone 3) indicates the extent of a flood with a 1% (1 in 100) chance of happening each year from a river and a 0.5% (1 in 200) chance of happening each year from the sea.

Areas Benefiting from Flood Defences

The information given in England and Wales is based on the Environment Agency's Flood Map, specifically the areas benefiting from flood defences. This shows areas that benefit from flood defences, 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.

Flood Defences

The information given in England and Wales is based on the Environment Agency's Flood Map, specifically the flood defences. This includes linear flood defences (such as walls and embankments). The linear flood defences shown are normally those built within the last 5 years to a specified standard. As a result not all flood defences may be shown.

Flood Water Storage Areas

The information given in England and Wales is based on the Environment Agency's Flood Map, specifically the flood water storage areas. This includes flood water storage areas (such as reservoirs and basins).

BGS Data Information

Where high susceptibility is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

Where moderately high susceptibility is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

Where moderate susceptibility is indicated, this means that given the geological conditions there may be a groundwater flooding hazard. Unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area you need take no further action in relation to groundwater flooding hazard. If there are records of previous incidences of groundwater flooding, then is recommended that other information e.g. rainfall history, property type, and land drainage information in addition to previous records of flooding be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

Where low susceptibility is indicated, this means that given the geological conditions there may be a groundwater flooding hazard. Unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area you need take no further action in relation to groundwater flooding hazard. If there are records of previous incidences of groundwater flooding, then is recommended that other information e.g. rainfall history, property type, and land drainage information in addition to previous records of flooding be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

Where susceptibility is negligible, this means that you need take no further action in relation to groundwater hazard in this area.

Where it is indicated that geological deposits which may be vulnerable to flooding are mapped in the search area, this does not necessarily mean that flooding will occur. The data behind the search are purely geological and do not take into account any man-made factors such as flood protection schemes. The data is indicating simply those geological deposits which have been associated with flooding in the recent geological past and which therefore may still be vulnerable to flooding. The BGS Geological Indicators of Flooding data should be regarded as complementary to, but not a replacement for, existing Environment Agency flood risk maps.

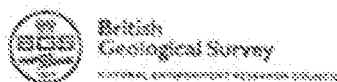
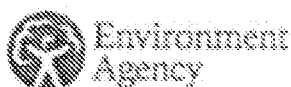
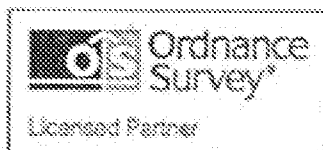
Property Based Flood Risk

Norwich Union have generated a detailed flood risk assessment to accurately evaluate the flood risk for individual customers.

The information from this assessment has been used to define the risk shown - this is based on the individual property rather than the postcode. The flood risk assessment undertaken by Norwich Union is for river flooding and coastal flooding. No assessment has been made for flooding from other sources like groundwater flooding, flash flooding, sewerage flooding or flooding caused by defective household equipment or plumbing.

Insurance Claims

This risk is derived from the number of flood insurance claims in the postcode sector. The data includes validated claims notified to insurers including river and coastal flood, heavy rainfall and flooding following blockages to sewers etc. They do not include an escape of water from a fixed appliance.



Contact Names and Addresses
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Telephone 0844 844 9966
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info@landmarkinfo.co.uk
www.landmarkinfo.co.uk

2 Environment Agency National Customer Contact Centre (NCCC)

PO Box 544
Templeborough
Rotherham
S60 1BY

Telephone 08708 506 506

enquiries@environment-agency.gov.uk

Please note that the Environment Agency/SEPA have a charging policy in place for enquiries.

3 British Geological Survey Enquiry Service

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
Nottinghamshire
NG12 5QG

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Fax 0115 936 3278

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