

**Proposed Relocation of Doctors Surgery  
Dome Caravan Park  
Hockley  
SS5 5LU**

**Flood Risk Assessment**

**S12-070/FRA  
August 2012**

***Prepared by :***

**Southwest Environmental Limited  
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EX15 3AA**

***On behalf of :***

**Huggins, Bromage and Ferguson  
109 Orsett Road  
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## 1.0 INTRODUCTION

Acting on instructions from Huggins Bromage Ferguson LLP, a Flood Risk Assessment is to be conducted with regards to the proposed development at **Dome Caravan Park**, Hockley. A site location plan is included within **Appendix 1**.

Southwest Environmental Limited was commissioned to carry out this Flood Risk Assessment (FRA), to identify whether there are any flooding or surface water management issues relating to the development site that may warrant further consideration.

This FRA presents a review of the existing available flood-related information and sets out the requirements of The National Planning Policy Framework and those of the Environment Agency (EA) and the Local Planning Authority (LPA) in relation to flood risk and drainage.

## 2.0 SCOPE

This FRA is prepared for the purposes of providing a generalised indication of the potential flood risk to the site, and to identify whether there are any flooding or surface water management issues relating to the development site that may warrant further consideration.

The report is based on information including Strategic Flood Risk Assessment (SFRA), EA Flood Maps, and consultations with the EA and LPA. A comprehensive third party data set (FIND Maps) is also used.

March 2012 saw the introduction of The National Planning Policy Framework. Guidance specific to flood risk assessment is given in "Technical Guidance to the National Planning Policy Framework (TGNPPF<sup>1</sup>)".

## 3.0 SITE SUMMARY

### 3.1 Site Description

<b>Site Address</b>	Dome Caravan Park Hockley SS5 5LU
<b>Grid Reference</b>	583509,194459
<b>Site Area</b>	0.01 ha

### 3.2 Proposed Development

The proposed development consists of the relocation of an existing doctors surgery. Plans for the proposed development are shown in **Appendix 1**.

This FRA is assembled on the basis of the proposed development as it is described / presented in Huggins Broamge Ferguson drawings.

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<sup>1</sup> [www.environment-agency.gov.uk/NPPF\\_technical\\_guidance\\_published\\_27Mar2012](http://www.environment-agency.gov.uk/NPPF_technical_guidance_published_27Mar2012)



Drawing Number	Description
DWG 5102 – 12 A	Proposed Plans and Elevations

## 4.0 CONSULTATIONS

### 4.1 Strategic Flood Risk Assessment (SFRA)

The Rochford Council Flood Risk Assessment (SFRA) referred to in this report is that issued in 2010 and is made available for public access on the Rochford Council Website.<sup>2</sup>

#### 4.1.1 Flood Risk Maps

The SFRA includes Flood Maps<sup>3</sup> based on assessment of fluvial flood risk. The maps illustrate the level of predicted flood risk both now and in the future. These maps can be viewed in **Appendix 2**.

The FIND maps are based on the Flood Zone classifications given in TGNPPF. The maps cover the Hockley area and are equivalent to the current Environment Agency flood maps for the corresponding area.

The SFRA maps indicate that the proposed development at Dome Caravan Park falls within Flood Zone 3 this is also the case with the FIND Maps flood risk mapping. Flood Zone 3 is defined by TGNPPF – Table 1 for;

*“This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.”*

High Resolution Maps showing the fluvial and inundation flood zoning are presented in Appendix 2 in the FIND Maps data set. These maps show the site as having significant flood risk, although it would appear that these risks are mitigated by flood defences but the flood defences are not detailed in published data. Confirmation of the presence and type of these defences was sought from the Environment Agency;

*“I am writing to confirm that there is a secondary defence protecting the Dome Caravan Park. The defence is constructed from clay and the location can be seen on the attached plan (the green line). There is a sluice that allows water to discharge through the defence which ultimately discharges through the primary defence into the River Crouch.”*

The EA's full response is included in Appendix 2.

#### 4.1.2 SFRA Technical Report Guidance

A key aim of a SFRA is to define flood risk management objectives and identify key policy considerations. It should be noted the SFRA states that it is ultimately the responsibility of the Council to formulate these policies and to implement them.

<sup>2</sup> [http://fs-drupal-rochford.s3.amazonaws.com/pdf/ldf\\_evibase\\_flood\\_1\\_78.pdf](http://fs-drupal-rochford.s3.amazonaws.com/pdf/ldf_evibase_flood_1_78.pdf)

<sup>3</sup> [http://fs-drupal-rochford.s3.amazonaws.com/pdf/ldf\\_evibase\\_flood\\_1\\_78.pdf](http://fs-drupal-rochford.s3.amazonaws.com/pdf/ldf_evibase_flood_1_78.pdf)



The SFRA includes details of policy considerations and sets out flood risk management objectives.

i) To management of Surface Water via SUDs;

*"The management of rainfall (surface water) is considered an essential element for reducing future flood risk to both the site and its surroundings, The Environment Agency expect attenuation of runoff from development sites to be restricted to green field rates and SUDs provide an opportunity for achieving this."*

(A list of acceptable SUDs designs can be viewed in Appendix 1 of the S12-053/DSMP)

ii) Improve Flood Awareness and Emergency Planning;

*"Flood warnings are issued using a set of four codes, each indicating the level of risk with respect to flooding."*

In addition the SFRA includes guidance for the application of SUDS for new developments, and recommends that the future ownership and management is addressed at an early stage.

## **4.2 The National Planning Policy Framework Requirements**

The National Planning Policy Framework (NPPF) referred to in this report was issued in March 2012. Flood risk assessment is explained more fully in the Technical Guidance Note/Document.

The stated aim of NPPF is to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk.

### **4.2.1 Flood Risk Vulnerability**

The Flood Risk Vulnerability Classification for the proposed development has been determined in accordance with Table 2 in TGNPPF. The proposed residential development is classified as a 'More Vulnerable' development.

### **4.2.2 Flood Risk Vulnerability and Flood Zone 'Compatibility'**

Table 2 in TGNPPF states that developments deemed as 'More Vulnerable' are appropriate for areas classified as within Flood Zone 1.

For the development in Flood Zone 1, TGNPPF guidance in Table 1 states that;

*"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 systems"*

For the Exception Test to be passed (not applicable in this instance):

*"For the Exception Test to be passed:*

- it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and*



- *a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.<sup>4</sup>*

### **4.3 Environment Agency Flood Risk Standing Advice**

Environment Agency Flood Risk Standing Advice has been withdrawn and is now included within NPPF.

#### **4.2.3 Flood Risk Assessments**

The FRA 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.

## **5.0 CLIMATE CHANGE**

Additional considerations incorporated on the migration of policy from PPS25 to NPPF include quantitative considerations for the effects of climate change.

*"In preparing . . . a site-specific flood risk assessment, the allowances for the rates of relative sea level rise shown<sup>5</sup>"*

The changing climate should be viewed in relation to the project's design life;

*"Category 1 – Temporary structures, not including structures or parts of structures that can be dismantled with a view to being re-used – 10 years*

*Category 3 – Agricultural and similar buildings – 15 to 30 years*

*Category 4 – Building structures and other common structures – 50 years*

*Category 5 – Monumental building structures, bridges and other civil engineering structures – 100 years<sup>6</sup>"*

### **5.1 Sea Level Change**

FCDPAG3 - Flood and Coastal Defence Appraisal Guidance gives guidance on the application of sea level changes to projects. Forecasted rises over the project's design life are in the order of 372mm.

---

<sup>4</sup> NPPF - 102

<sup>5</sup> TGNPPF - 11

<sup>6</sup> BS EN 1990, Eurocode - Basis of structural design

**Table 4: Recommended contingency allowances for net sea level rises**

	Net sea level rise (mm per year) relative to 1990			
	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
East of England, east midlands London, south-east England (south of Flamborough Head)	4.0	8.5	12.0	15.0
South-west England	3.5	8.0	11.5	14.5
North-west England, north-east England (north of Flamborough Head)	2.5	7.0	10.0	13.0

## 5.2 Climatic Conditions

FCDPAG3 - Flood and Coastal Defence Appraisal Guidance gives guidance on the application of sea level changes to projects.

**Table 5: 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%	

These climatic condition should be taken in to account in an Surface Water Management features, such as attenuation tanks and SUDs.

## 6.0 DISCUSSION

### 6.1 Sources of Flood Risk

It is confirmed that the eastern boundary of the site crosses partially in to flood zone 2, this can be seen on various flood risk maps from numerous sources, there is a very slight incursion in to Flood Zone 3.

### 6.2 Location of Existing Flood Defences

Flood defences have been installed as detailed in the Environment Agency response in Section 4.1.1.



### 6.3 Surface Water Run-off

In accordance with the recommendations of the EA and LPA, a Surface Water Management Plan (S12-070/SMP) should be produced to address the issue of surface water flooding.

A surface water drainage strategy should be produced, which should include a drainage layout drawing based on appropriate calculations. The calculations and strategy should demonstrate that the proposed design meets the specific requirements.

### 7.0 EXCEPTIONS TEST

The development represents a "more vulnerable" development situated in Flood Zone 3 and as such is subject to the exceptions test. See Figure 2.

**Table 3: Flood risk vulnerability and flood zone 'compatibility'**

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 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

**Figure 1 - Exception Test Required?**

### 7.1 Wider Sustainability Benefits

The new buildings will comply with part L of the building regulations and as such be very energy efficient, particularly when compared to existing stock. This will contribute to national and local targets to lower carbon emissions. This will also provide "*affordable comfort*" for occupiers.

The proposed development incorporates hedges, gardens, and trees, which will add to the amenity of the local area, and will be more aesthetically pleasing than the site in its current state.

### 7.2 Use of Brown Field Land

The development is to utilise brown field land.



### 7.3 Flood Safety

The development is partly situated within Flood Zone 3 it is fair to assume that it will be some risk from flooding.

There are historic flooding events in the immediate area, and the flood 3 only incurs on the site, and appear to overlie areas earmarked for development.

A "flood plan" for users will manage risk posed by flooding to acceptable levels. Overtopping of existing flood defence would lead to rapid water ingress.

### 8.0 CONCLUSIONS

Without the existing flood defences the proposed site would be at *significant* risk from flooding. The flood defences provide mitigation against the risk of flood but there is still *moderate* residual risk. Overtopping of these defences occurred in January 1953.

The building design should be designed to take in to account flooding events. Flood resilient design should be opted for owing to the anticipated depths of flood water that may be encountered.

Under the current legislative framework the project has been assessed at an acceptable risk, and owing to the community and sustainability benefits it is recommended that planning permission be granted.

### 9.0 CERTIFICATION

*For the avoidance of doubt, the parties hereby expressly agree that the Consultant takes no liability for and gives not warranty against actual flooding of The Client's property in relation to the performance of the service.*

*This report is produced for the sole use of the Client, and no responsibility of any kind, whether for negligence or otherwise, can be accepted for any Third Party who may rely upon it.*

*The conclusions and recommendations given in this report are based on our understanding of the future plans for the site.*

*The scope of this FRA was discussed and agreed with the Client. No responsibility is accepted for conditions not encountered, which are outside of the agreed scope of work. This flood risk report relates to the proposed doctors surgery site edged blue on the plans in appendix 2. It does not gauge risk to the surrounding area, as that is outside of the agreed scope.*

Prepared by:

**William James Thorpe BSc PGD MCIWEM**

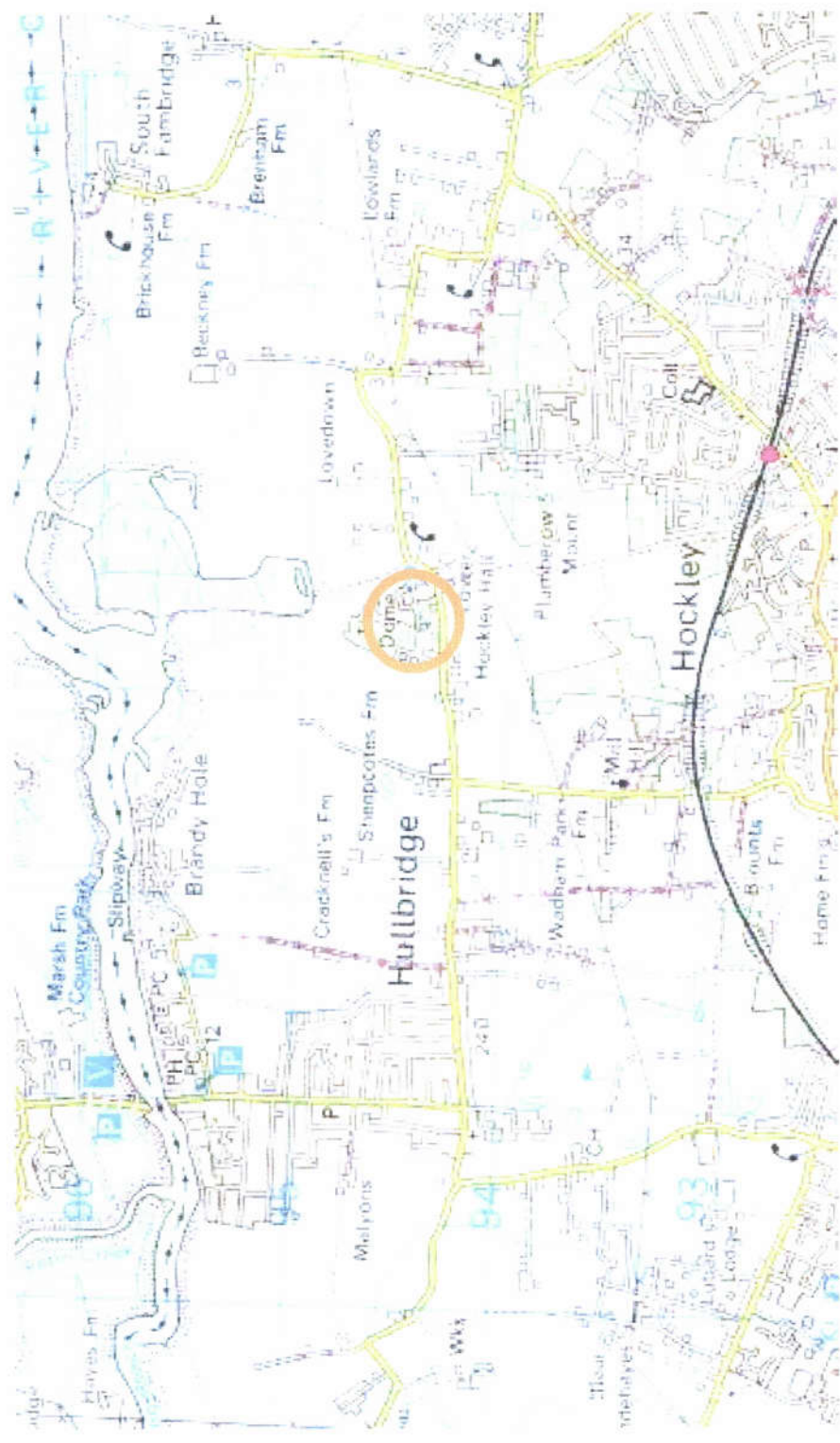
**Managing Director**



## **Appendix 1**

Proposed Development Plan  
Site Location

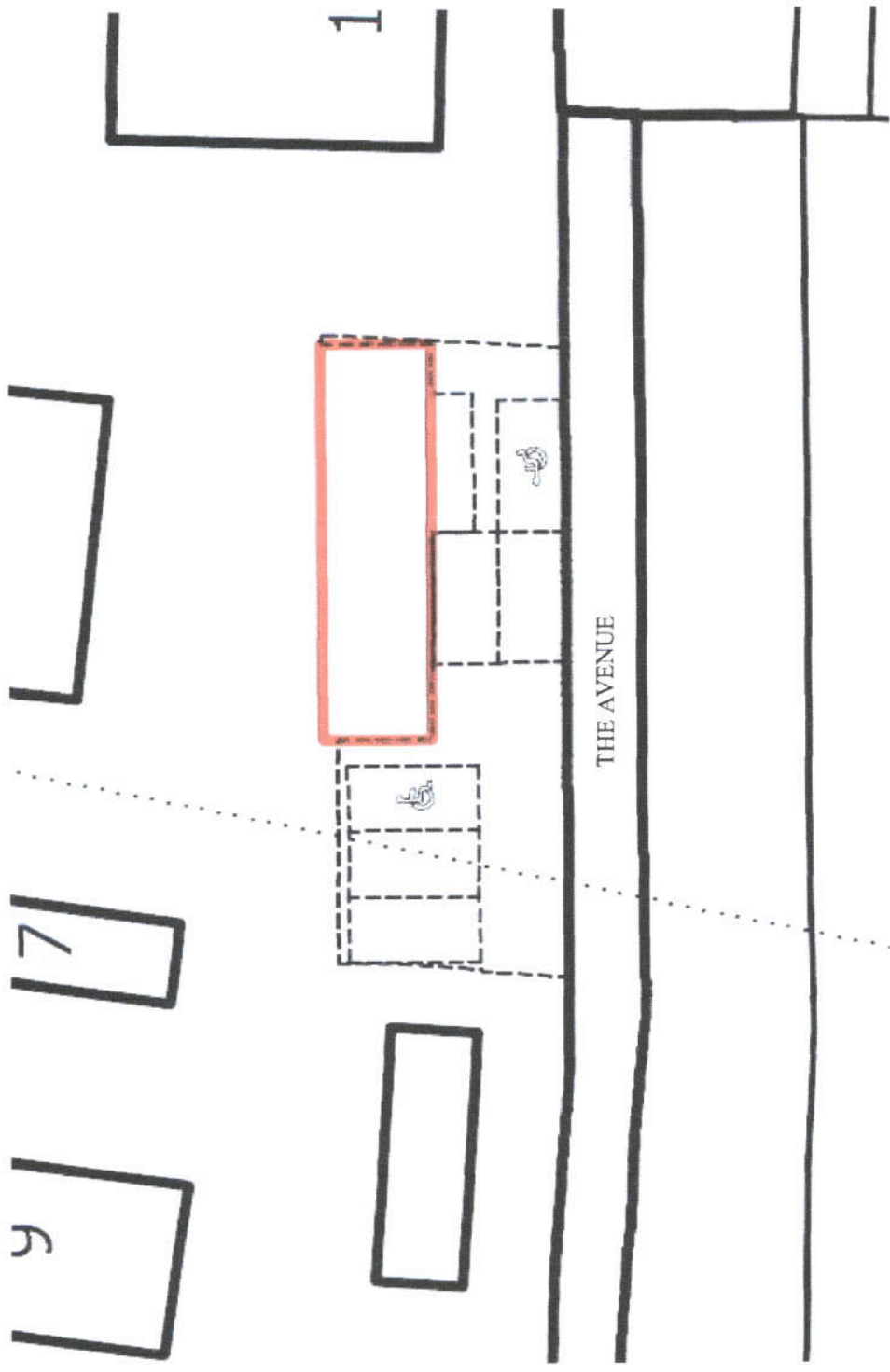
## Location



Client: HBF  
Project No: S12-070

Southwest Environmental Limited  
6 The Square  
Uffculme  
EX15 3AA  
Telephone 01884 840 491  
email wt@southwest-environmental.co.uk

**Proposed  
Development**



**Client:** HBF  
**Project No:** S12—070

**Southwest Environmental Limited**  
6 The Square  
Uffculme  
EX15 3AA  
Telephone 01884 840 491  
email [wt@southwest-environmental.co.uk](mailto:wt@southwest-environmental.co.uk)



## **Appendix 2**

Flood Data (Find Maps)  
SFRA Maps (From District Council)



Report Reference: FIND-21417  
Client Reference: S12-070  
Report Date: Jul 23, 2012  
Report Delivery Method: **Email - pdf**  
Client Email: support@findmaps.co.uk

## **GroundSure FloodInsight**

### **Address:**

Dear Sir/Madam,

Thank you for placing your order with FIND. Please find enclosed the GroundSure FloodInsight report as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 020 7202 2730 quoting the above report reference number.

Yours faithfully,

FIND

Enc.  
GroundSure FloodInsight

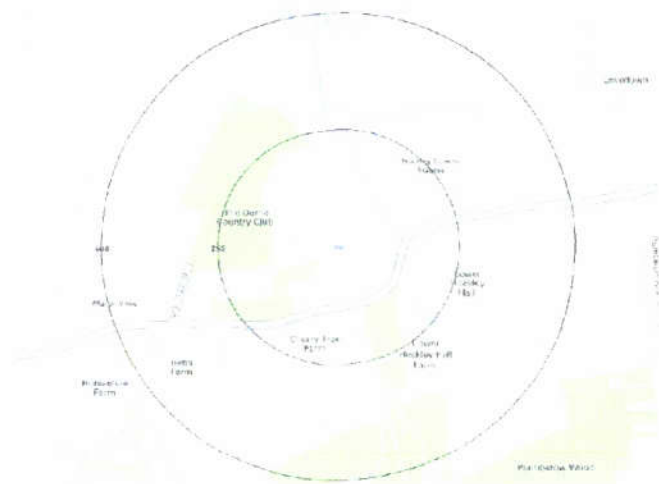
# GroundSure FloodInsight

**Address:**

**Date:** Jul 23, 2012

**Client Reference:** S12-070

**Client:** FIND



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**Report Reference:** FIND-21417

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email: [support@findmaps.co.uk](mailto:support@findmaps.co.uk) [www.findmaps.co.uk](http://www.findmaps.co.uk)



## Aerial Photograph of Study Site



Aerial photography supplied by Getmapping PLC.  
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Site Name:

Grid Reference: 583509,194459

Size of Site: 0.01 ha

Report Reference: [FIND-21417](#)

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Page 3

## Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed.

### Report Section

#### 1. Environment Agency Flood Zones

1.1 Are there any Environment Agency Indicative Zone 2 floodplains within 250m of the study site?	Yes
1.2 Are there any Environment Agency Indicative Zone 3 floodplains within 250m of the study site?	Yes
1.3 Are there any Flood Defences within 250m of the study site?	No
1.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	Yes
1.5 Are there any areas used for Flood Storage within 250m of the study site?	No

#### 2. National Flood Risk Assessment (NaFRA)

2.1 What is the National Flood Risk Assessment (NaFRA) Flood Rating for the study site?	Significant
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#### 3. Historic Flood Events

3.1 Has the site been subject to past flooding as recorded by the Environment Agency?	No
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#### 4. Surface Water Floods

4.1 Is the site or any area within 50m at risk of Surface Water (Pluvial) Flooding?	Yes
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#### 5. Groundwater Flooding

5.1 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Very High
5.2 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Moderate

#### 6. BGS Geological Indicators of historic flooding

6.1 Are there any geological indicators of historic flooding within 250m of the study site?	No
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#### 7. JBA Reservoir failure

7. Is the property located in an area identified as being at potential risk in the event of a reservoir failure?	No
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## Additional Matters

Riparian ownership	If your land abuts a river, stream or ditch, you may have responsibility to maintain this watercourse, even if Title Deeds show the property boundary to be adjacent to the watercourse. This includes the responsibility for clearing debris and obstructions which may impede the free passage of water and fish, and also includes the responsibilities to accept flood flows through your land, even if these are caused by inadequate capacity downstream. There is no duty in common law for a landowner to improve the drainage capacity of a watercourse. Please contact GroundSure if you need further advice on riparian ownership issues relating to this property.
Sewerage Flooding	Extreme rainfall events may overwhelm sewerage systems and cause local flooding. The water and sewerage companies within the UK are required to maintain 'DG5 – At Risk Registers' which record properties that have flooded from sewers and/or are considered to be at risk of flooding from sewers in the future. If your property is on the 'At Risk' Register, this may be recorded within a standard CON29 Drainage and Water search.



## Using this Report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between GroundSure and the Client.

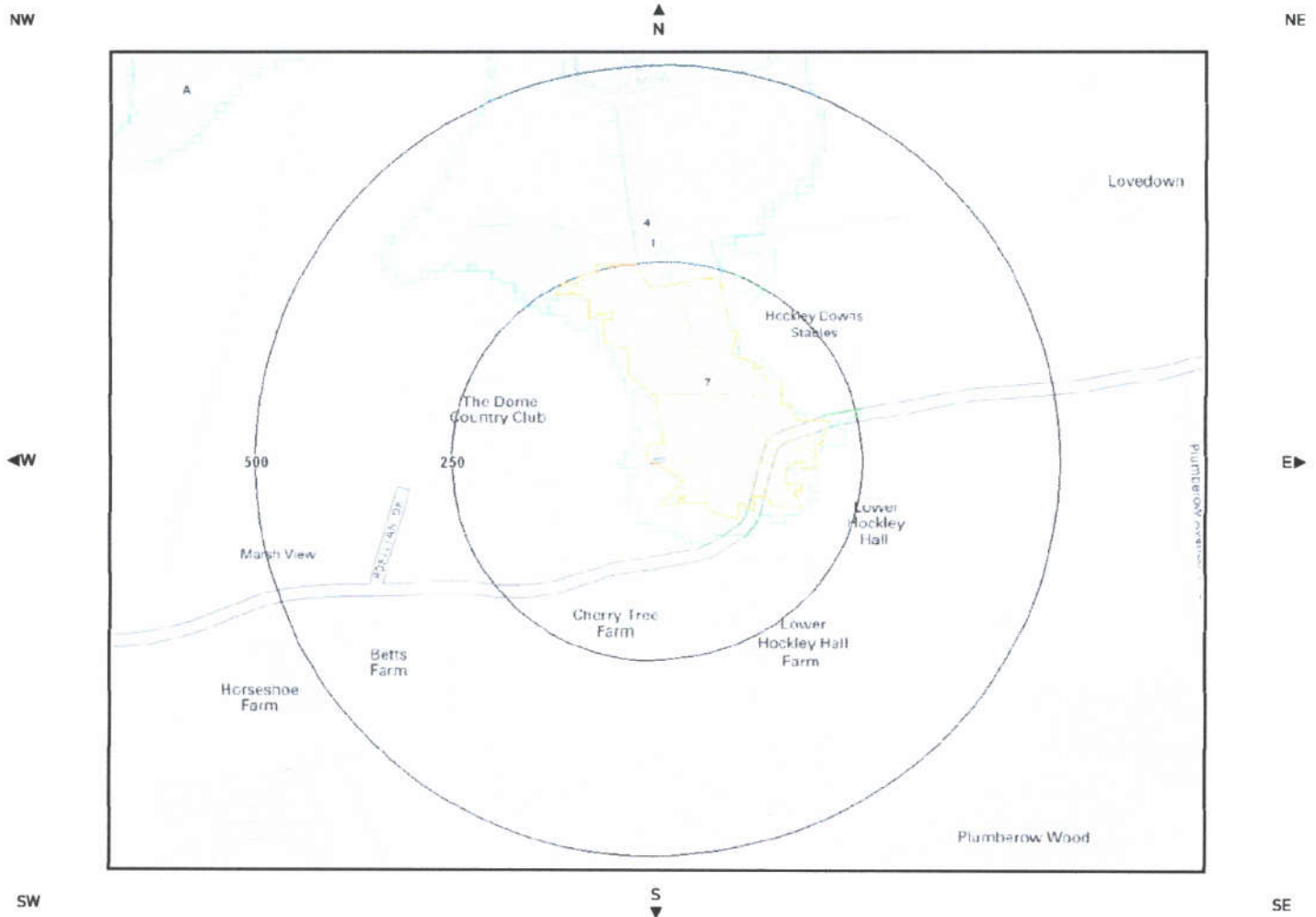
### Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

# 1. River and Coastal Flood Map

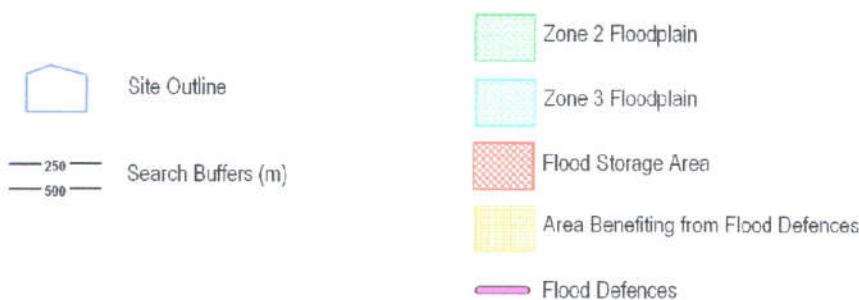


River and Coastal Flood Legend

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# 1. Environment Agency Flood Zones

## 1.1 River and Coastal Zone 2 Flooding

**Is the site within 250m of an Environment Agency Indicative Zone 2 floodplain?**

**Yes**

Zone 2 floodplain estimates the annual probability of flooding as one in one thousand (0.1%) or greater from rivers and the sea but less than 1% from rivers or 0.5% from the sea. Alternatively, where information is available they may show the highest known flood level. Any relevant data is represented on Map 1 – River and Coastal Flooding:

The following floodplain records are represented as green shading on the Flood Map (1):

ID	Distance [m]	Direction	Update	Type
1	0.0	On Site	04-Jul-2012	Zone 2 - (Tidal Models)

## 1.2 River and Coastal Zone 3 Flooding

**Is the site within 250m of an Environment Agency Indicative Zone 3 floodplain?**

**Yes**

Zone 3 estimates the annual probability of flooding as one in one hundred (1%) or greater from rivers and a one in two hundred (0.5%) or greater from the sea. Alternatively, where information is available they may show the highest known flood level. Any relevant data is represented on Map 1 – River and Coastal Flooding.

The following floodplain records are represented as green shading on the Flood Map (1):

ID	Distance [m]	Direction	Update	Type
4	0.0	On Site	04-Jul-2012	Zone 3 - (Tidal Models)

## 1.3 River and Coastal Flood Defences

**Are there any Flood Defences within 250m of the study site ?**

**No**

Only flood defences constructed within the last five years to Environment Agency standards are likely to be shown within this dataset. Any relevant data is represented on Map 1 – River and Coastal Flooding.

## 1.4 Areas benefiting from Flood Defences

**Are there any areas benefiting from Flood Defences within 250m of the study site?**

**Yes**

Any relevant data is represented on Map 1 – River and Coastal Flooding.

## 1.5 Areas used for Flood Storage

**Are there any areas used for Flood Storage within 250m of the study site?**

**No**

Flood Storage Areas are considered part of the functional floodplain, and are areas where water has to flow or be stored in times of flood. *Planning Policy Statement (PPS) 25: Development and Flood Risk* states that only water-compatible development and essential infrastructure should be permitted within flood storage areas, and existing development within this area should be relocated to an area with a lower risk of flooding. Any relevant data is represented on Map 1 – River and Coastal Flooding.



#### Notes on Flood Zone Data:

This data relates solely to flooding from rivers or the sea. The Environment Agency estimate that over 2.5 million properties are at risk of flooding within England and Wales. **River flooding** occurs when a watercourse cannot cope with the water draining into it from the surrounding land. This can happen, for example, when heavy rain falls on an already waterlogged catchment. **Coastal flooding** results from a combination of high tides and stormy conditions. If low atmospheric pressure coincides with a high tide, a tidal surge may happen which can cause serious flooding.

The GroundSure FloodInsight Report comments upon whether a property lies in proximity to Environment Agency Zone 2 and Zone 3 floodplains. The Government's Planning Policy Statement 25 on Development and Flood Risk (PPS25) explains how flood risk should be considered at all stages of the planning and development process in order to reduce future damage to property and potential loss of life. The Government looks to planning authorities to ensure that flood risk is properly taken into account in the planning of developments to reduce the risk of flooding and the damage which floods cause.

The Environment Agency Flood Mapping Strategy covers a five-year period from 2003 to 2008 and sets out to improve the quality and coverage of data and information on actual and potential flood risk. One of the key outputs of the strategy is the production of the flood zones, to enable planning authorities to apply the sequential test (see Annex D of PPS25) for development proposals and prevent inappropriate development.

PPS25 defines the flood zones as: -

- Zone 1 – little or no risk with an annual probability of flooding from rivers and the sea of less than 0.1%
- Zone 2 – low to medium risk with an annual probability of flooding of 0.1-1.0% from rivers and 0.1-0.5% from the sea.
- Zone 3 – high risk with an annual probability of flooding of 1.0% or greater from rivers, and 0.5% or greater from the sea.
- Flood Zone 3b/Flood Storage Areas - very high risk with the site being used as part of the functional flood plain or as a Flood Storage Area.

The flood zones provide more accurate and consistent information on flood risk using the definitions detailed in PPS25 than the previous Indicative Floodplain Map (IFM). The flood zones are the main constraint map underpinning decisions on development and flood risk.

#### Flood Defences

Flood defences seek to reduce the risk of flooding and to safeguard life, protect property, sustain economic activity and the natural environment. Flood defences are designed to protect against flood events of a particular magnitude, expressed as risk in any one year. For example, defences in urban areas may be built to provide protection against flood events of a size which might occur on average once in one hundred years or less.

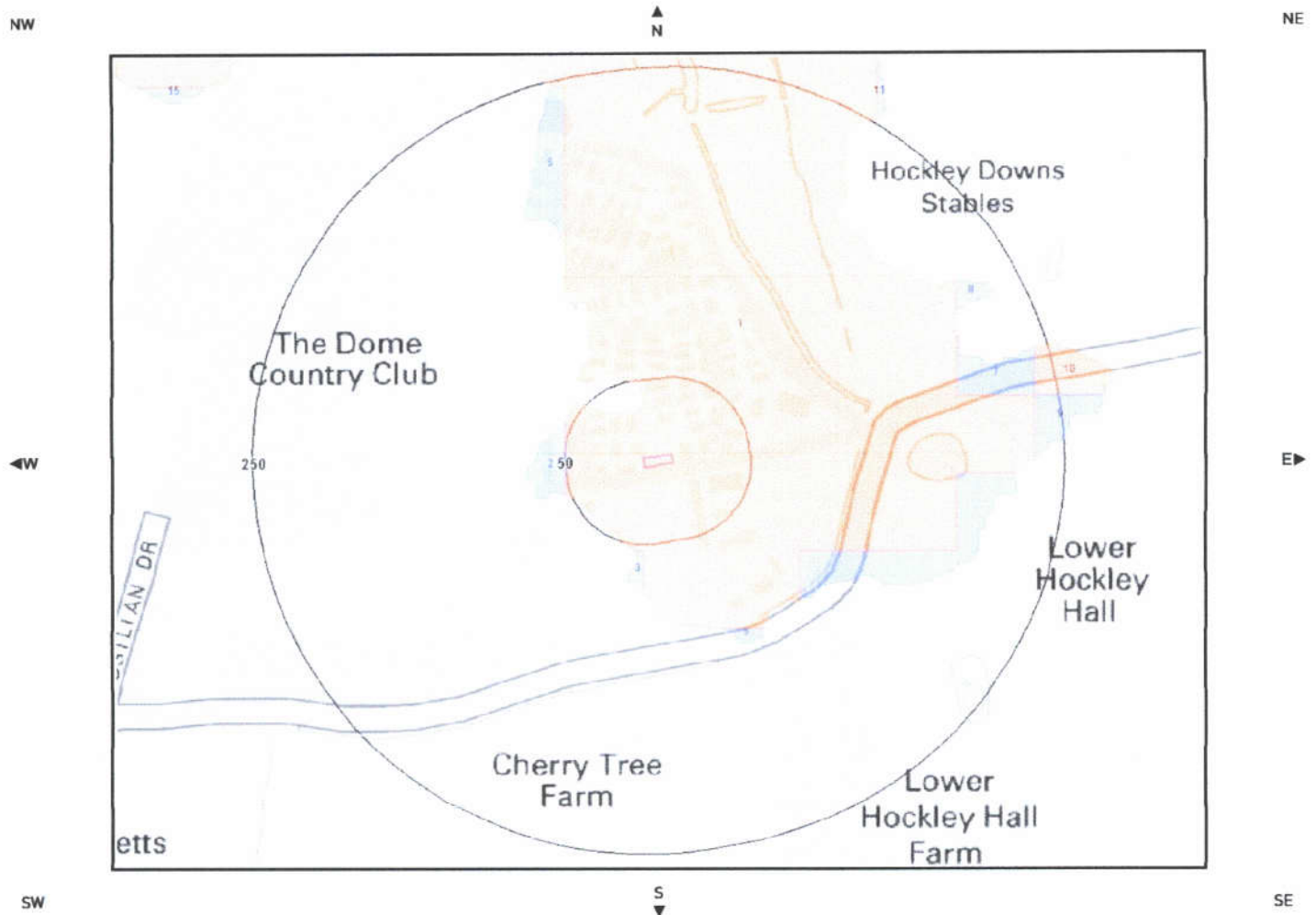
All flood defences constructed during the last five years have a standard of protection equal to or better than 1% for rivers and 0.5% from the sea. Some additional defences, which may be older or may have been designed to provide a lower standard of protection, are also shown within the data GroundSure provides.

#### Flood Storage Areas

Flood Storage Areas may also act as flood defences. A flood storage area may also be referred to as a balancing reservoir, storage basin or balancing pond. Its purpose is to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel. It may also delay the timing of a flood peak so that its volume is discharged over a longer time interval.

A flood storage area may take the form of a wet or dry reservoir. A wet reservoir is a water storage facility in which storage can be effected by allowing water levels to rise during flood times. A dry reservoir is typically adjacent to a river and comprises an enclosed area that accepts water only at peak times. These areas are also referred to as Zone 3b or 'the functional floodplain' and has a 5% or greater chance of flooding in any given year, or is designed to flood in the event of an extreme (0.1%) flood or another probability which may be agreed between the Local Planning Authority and the Environment Agency, including water conveyance routes. Development within Flood Storage Areas is severely restricted.

## 2. NaFRA 2008 Flooding Map



NaFRA 2008 Flood Legend

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Report Reference: [FIND-21417](#)

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## 2.1 National Flood Risk Assessment (NaFRA 2008) Flood Rating (River and Coastal)

**What is the highest risk of flooding onsite?**

**Significant**

The Environment Agency NaFRA database provides an indication of flood river and coastal risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach, and the distance from the river or the sea.

Most insurance companies providing cover for flood risk use this data as the basis of their risk model, although they may also utilise additional information such as claims histories, which may further influence their decision. Where a significant risk of flooding is identified flood risk insurance may be difficult to obtain without further work being undertaken. Property owners of sites within Low and Moderate risk areas are still considered to be at risk of flooding and insurance premiums may be increased as a result. Owners of properties within Low, Moderate and Significant risk areas, as well as areas yet to receive a full assessment are advised to sign up to the Environment Agency's Floodline Warning scheme.

NaFRA data for the study site indicates the property has a significant (1 in 75 or greater) chance of flooding in any given year.

Any relevant data within 250m is represented on the NaFRA Flood map. Data to 50m is reported in the table below.

ID	Distance [m]	Direction	NaFRA flood Risk
1	0.0	On Site	Significant
2	50.0	W	Moderate

Notes on NaFRA data:

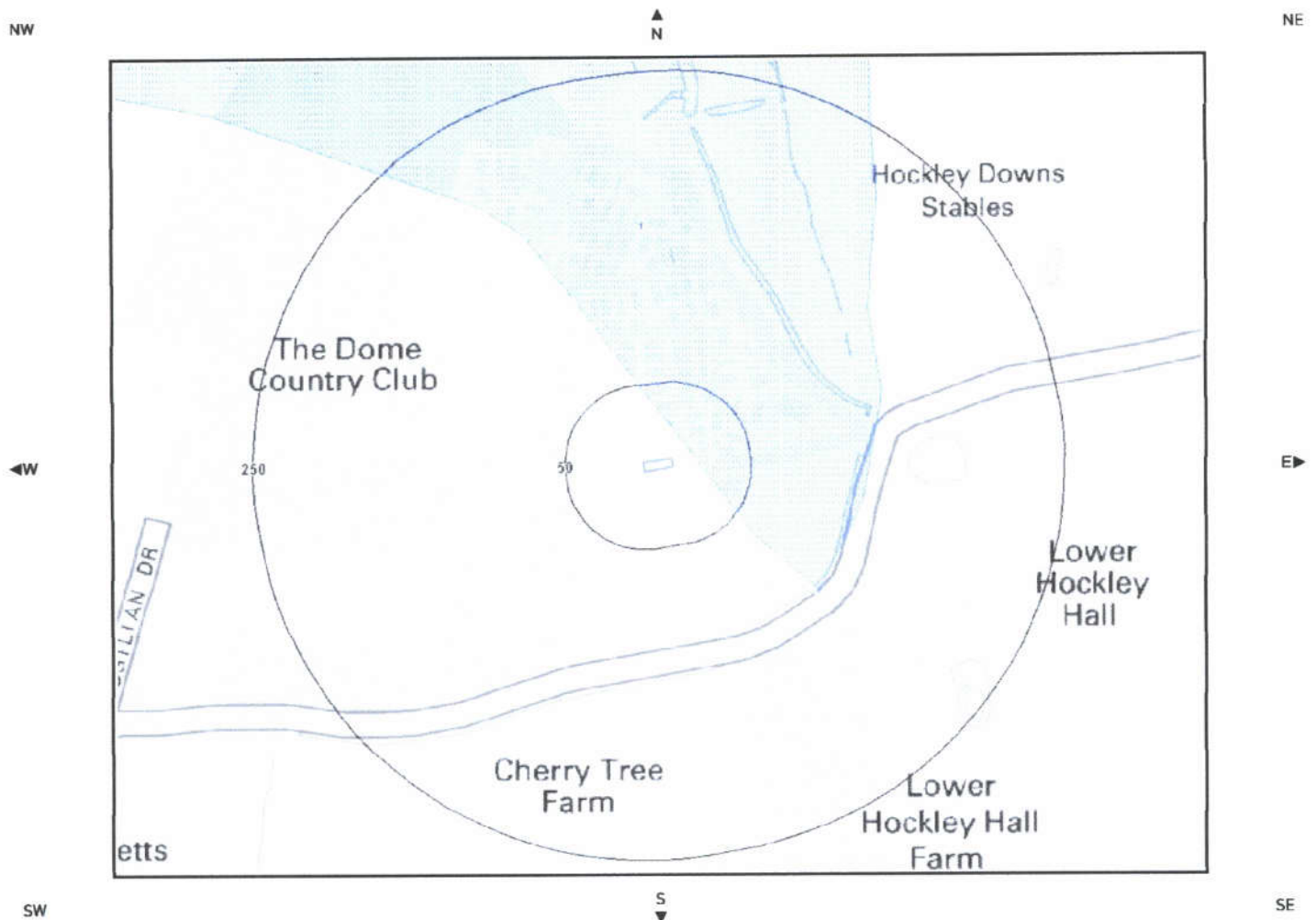
This information is based on the very latest Environment Agency National Flood Risk Assessment (NaFRA 2008) data. This data has been created by dividing the flood plain into 50m squares, or smaller areas where a square is intersected by a river or coastline. These are called impact cells. The method then calculates the likelihood that the centre of each impact cell will start to flood using a number of different flood scenarios.

Most insurance companies providing cover for flood risk use this data as the basis of their risk model, although they may also utilise additional information such as claims histories, which may further influence their decision. Where a significant risk of flooding is identified flood risk insurance may be difficult to obtain without further work being undertaken. Property owners of sites within Low and Moderate risk areas are still considered to be at risk of flooding and insurance premiums may be increased as a result. Owners of properties within Low, Moderate and Significant risk areas are advised to sign up to the Environment Agency's Floodline Warning scheme. The probability estimates for NaFRA risk bands are as follows:

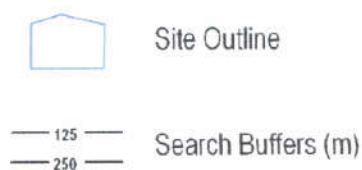
- Negligible – the chance of flooding from rivers or the sea is considered to be less than 0.1% (1 in 1000)
- Low – the chance of flooding from rivers or the sea is greater than 0.1% (1 in 1000) but less than 0.5% (1 in 200)
- Moderate – the chance of flooding from rivers or the sea is greater than 0.5% (1 in 200) but less than 1.3% (1 in 75)
- Significant – the chance of flooding from rivers or the sea is greater than 1.3% (1 in 75)

Additionally, a site may fall within an area not yet fully assessed within NaFRA – noted as 'No data available' or 'No Result'. These areas tend to fall within existing floodplains, and hence a cautionary approach is taken and these areas are treated as though they have the potential to lie within areas considered to be at Significant risk of flooding.

### 3. Historic Flooding Events



#### Historic Flooding Legend



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## 3.1 Historic Flood Outlines

**Has the site or any area within 250m been subject to historic flooding as recorded by the Environment Agency?**  
**Yes**

This database shows the individual footprint of every flood event recorded by the Environment Agency and previous bodies.

Any records found within the search radius are displayed on Map 3 – Historic Flooding Events.

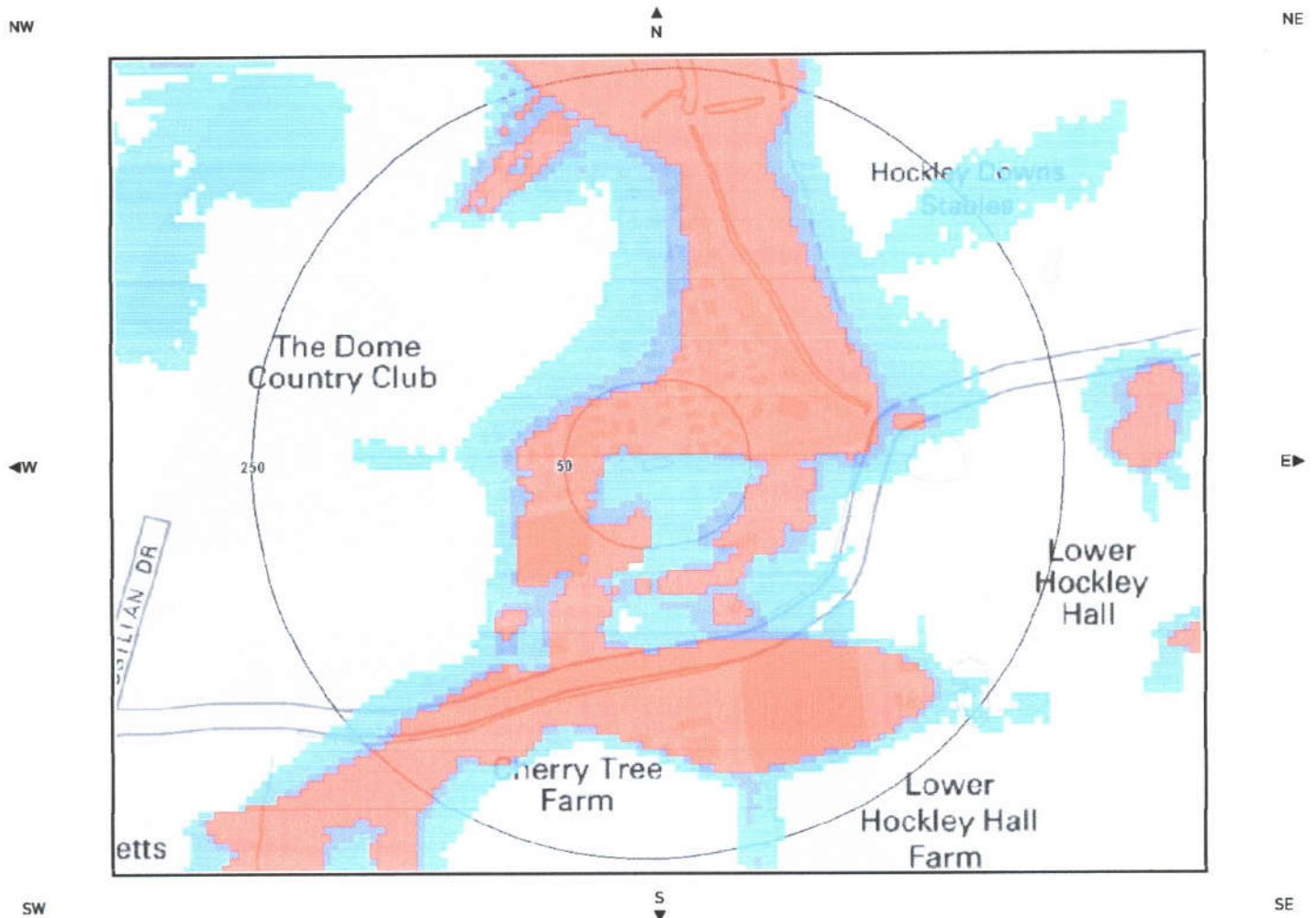
ID	Distance [m]	Direction	Event Name	Date of flood	Flood Source	Flood Cause	Type of Flood	Environment Agency Comments
1	12.0	NE	1953 tidal flooding Essex	Start Date: 31-01-1953 End Date: 01-02-1953	sea	overtopping of defences	Tidal	Outlines taken from ex-customer service maps

### Notes on Historic Flooding data:

Over 21,000 separate events are recorded within this database, dating back to 1947. This data is used to understand where flooding has occurred in the past and provides details as available. Absence of a historic flood event for an area does not mean that the area has never flooded, but only that the Environment Agency do not currently have records of flooding within the area. Equally, a record of a flood footprint in previous years does not mean that an area will flood again, and this information does not take account of flood management schemes and improved flood defences.



## 4. JBA Surface Water (Pluvial) Flood Map



Surface Water (Pluvial) Flood Legend

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The data is provided by JBA Risk Management Limited, © Jeremy Benn Associates Limited and JBA Risk Management Limited 2008, 2009, 2010, 2011.



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## 4.1 JBA Surface (Pluvial) Water Flooding

Surface Water (pluvial) flooding is defined as flooding caused by rainfall-generated overland flow before the runoff enters a watercourse or sewer. In such events, sewerage and drainage systems and surface watercourses may be entirely overwhelmed.

Surface Water (pluvial) flooding will usually be a result of extreme rainfall events, though may also occur when lesser amounts of rain falls on land which has low permeability and/or is already saturated, frozen or developed. In such cases overland flow and 'ponding' in topographical depressions may occur.

### What is the risk of pluvial flooding at the study site?

**Low**

Guidance: The site or an area in close proximity has been assessed to be at Low Risk of surface water (pluvial) flooding. This indicates that this area would be expected to be affected by surface water flooding in a 1 in 1000 year rainfall event to a depth of greater than 0.1m.

This data is provided by JBA Consulting, © Jeremy Benn Associates Limited 2008/2009

The following pluvial (surface water) flood risk records within 50m of the study site are shown on the JBA Surface Water Flooding Map:

Distance	Direction	Risk
0.0	On Site	Low
3.0	N	Significant
11.0	NW	Low to Moderate
14.0	S	Low to Moderate
20.0	W	Low to Moderate
26.0	E	Low to Moderate
37.0	SE	Low to Moderate
45.0	NW	Low to Moderate

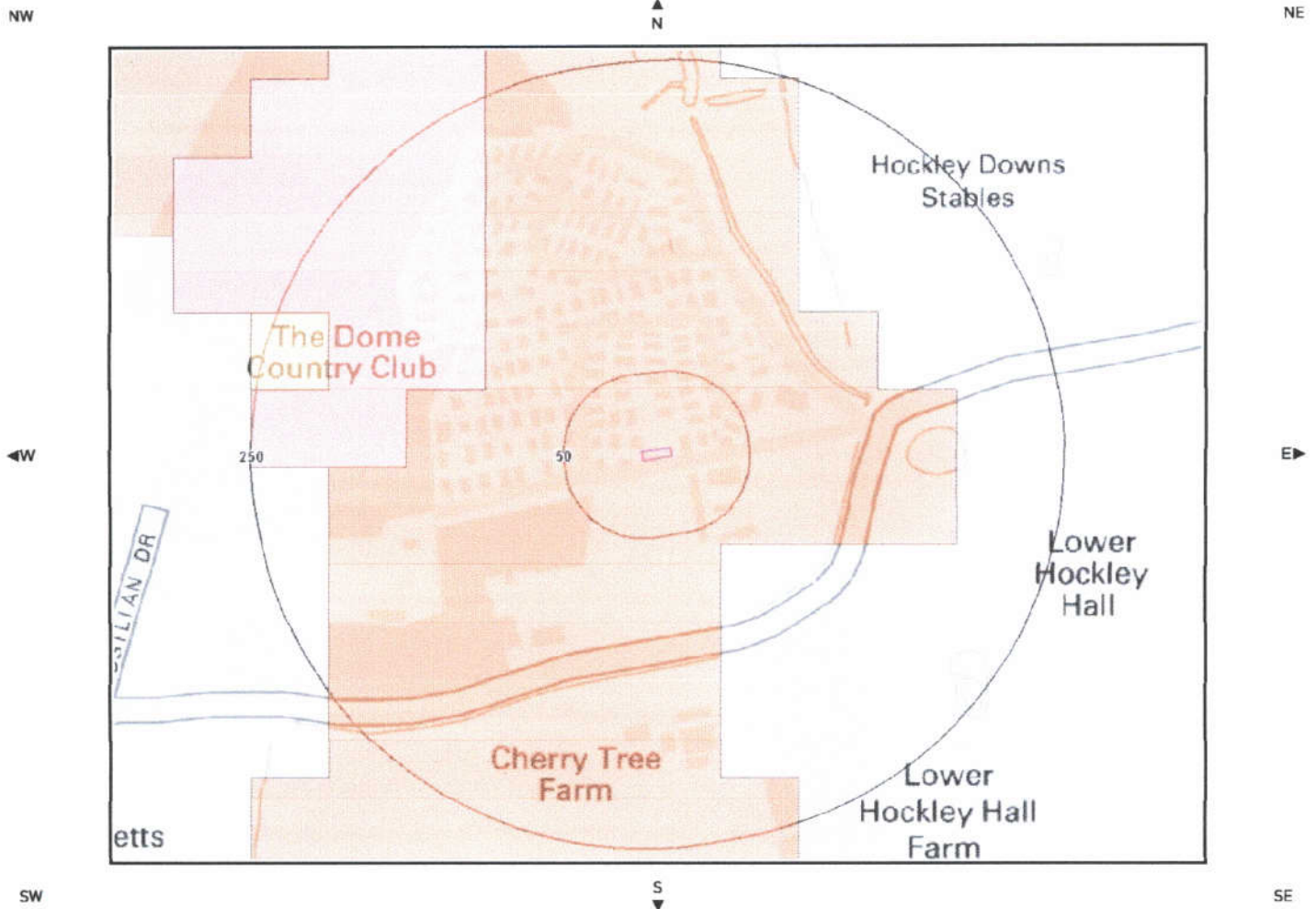
### Notes on Surface water (Pluvial) Flooding data:

JBA Consulting surface water flood map identifies areas likely to flood following extreme rainfall events, i.e. land naturally vulnerable to surface water or "pluvial" flooding. This data set was produced by simulating 1 in 75 year, 1 in 200 year and 1 in 1000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though older ones may even flood in a 1 in 5 year rainstorm event.

The model provides the maximum depth of flooding in each 5m "cell" of topographical mapping coverage. The maps include 5 bands indicating areas of increasing natural vulnerability to surface water flooding. These are:-

- 0.1m or greater in a 1 in 1,000 year rainfall event - Low
- Between 0.1m and 0.3m in a 1 in 200 year rainfall event - Low to Moderate
- Between 0.3m and 1.0m in a 1 in 200 year rainfall event - Moderate
- Greater than 1.0m in a 1 in 200 year rainfall event - High
- Greater than 0.1m in a 1 in 75 year rainfall event - Significant

## 5. Groundwater Flooding Map



BGS Groundwater Flood Legend

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## 5.1 Groundwater Flooding Susceptibility Areas

**Are there any British Geological Survey groundwater flooding susceptibility flood areas within 50m of the boundary of the study site?**

**Yes**

**What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?**

**Very High**

Where very 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.

## 5.2 Groundwater Flooding Confidence Areas

**What is the British Geological Survey confidence rating in this result?**

**Moderate**

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The **confidence rating** is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

### Notes on Groundwater Flooding data:

The British Geological Survey (BGS) Susceptibility to Groundwater Flooding hazard dataset identifies areas where geological conditions could potentially enable groundwater flooding to occur and where groundwater may come close to the ground surface. The dataset is supplied with confidence information which provides an indication of the resolution and quality of the data behind the susceptibility assessment.

The susceptibility data is suitable for use for regional or national planning purposes where the groundwater flooding information will be used along with a range of other relevant information to inform land-use planning decisions. It might also be used in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information, to establish relative, but not absolute, risk of groundwater flooding at a resolution of greater than a few hundred metres. It should be noted that the susceptibility data is based entirely upon geological data, and does not take into account topography, actual depths of water tables etc.

In all cases it is strongly recommended that the confidence data is used in conjunction with the groundwater flooding susceptibility data. The susceptibility data should not be used on its own to make planning decisions at any scale, and, in particular, should not be used to inform planning decisions at the site scale. The susceptibility data cannot be used on its own to indicate risk of groundwater flooding and is merely an indication of the susceptibility of certain geological deposits to groundwater flooding, not an indication of likelihood of such flooding occurring.

The susceptibility to groundwater flooding is calibrated on a fivefold scale by the BGS:-

- Where susceptibility is **not applicable**, this means that you need take no further action in relation to groundwater hazard in this area.
- 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 **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 **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

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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 **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.

The **confidence rating** is also measured on a fivefold scale - Low, Moderately Low, Moderate, Moderately High and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.



## 6. BGS Geological Indicators of Flooding

**Are there any geological indicators of flooding within 250m of the study site?**

**No**

This dataset identifies the presence of superficial geological deposits which indicate that the site may be, or have been in the past, vulnerable to inland and/or coastal flooding. This assessment does not take account of any man-made factors such as flood protection schemes, and the data behind the report are purely geological.

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Notes on BGS Geological Indicators of Flooding data:

The BGS Geological Indicators of Flooding (GIF) data set is a digital map based on the BGS Digital Geological Map of Great Britain at the 1:50,000 scale (DIGMapGB-50). It was produced by characterising Superficial (Drift) Deposits on DIGMapGB-50 in terms of their likely vulnerability to flooding, either from coastal or inland water flow. These Superficial Deposits are considered 'recent' in geological terms, most having been formed in the later parts of the Quaternary geological period (i.e. within the last few tens of thousands of years). Observations made during recent major inland and coastal flooding events have demonstrated that the erosion and deposition of these recent geological sediments have produced subtle topographical variations, resulting in landforms such as fluvial and coastal floodplains. The mapping of these landforms, in conjunction with the fluvial and/or coastal deposits that underlie them, has in turn determined the extent of previous coastal and inland flooding.

On this basis, the floodplains which are at greatest risk from flooding can be both visualised and defined by Superficial Deposits as depicted on geological maps. These include deposits such as river alluvium and lacustrine (lake) alluvium, as well as the First River Terrace or 'Floodplain terrace' (raised flat areas adjacent to or within floodplains, which represent the level of the floodplain prior to the most recent episode of down-cutting). Older and higher river terraces have been excluded as they lie outside the geologically defined floodplain. Areas at risk from coastal inundation are similarly characterised by a range of estuarine or marine deposits that include, for example, tidal flats.

## 7. JBA Reservoir Failure Impact Modelling

**Is the property located in an area identified as being at potential risk in the event of a reservoir failure?**

**No**

JBA consulting have modelled the flooding impact from 1,700 reservoirs in England and Wales, should there be a catastrophic failure of a reservoir wall or embankment.

Guidance: None required

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Notes on Reservoir Failure Impact data:

This dataset identified areas that are most likely to flood following the sudden catastrophic failure of a reservoir and is provided by JBA Consulting. JBA has identified over 1,700 reservoirs that pose a risk to people and property. These maps identify properties that would flood in the unlikely event of the failure of the reservoir's dam or embankment. Empirical methods were used to predict the flow that would result from the failure which was then modelled onto high resolution Digital Terrain Models (DTM) using JBA's advanced 2D hydraulic modelling techniques. The model provides the maximum depth of flooding in each cell of the DTM.

## 8. Contacts

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[enquiries@bgs.ac.uk](mailto:enquiries@bgs.ac.uk)  
Web: [www.bgs.ac.uk](http://www.bgs.ac.uk)  
BGS Geological Hazards Reports and general geological enquiries



**British Geological Survey**  
NATURAL ENVIRONMENT RESEARCH COUNCIL

### Environment Agency

Floodline tel: 0845 988 1188  
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Web: [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)  
Email: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)



**Environment Agency**

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01756 799919



### Ordnance Survey

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Tel: 08456 050505



**Ordnance Survey**

### Local Authority

Authority: Rochford District Council  
Phone: 01702 546 366  
Web: [www.rochford.gov.uk](http://www.rochford.gov.uk)  
Address: Council Offices, South Street, Rochford, Essex,  
SS4 1BW

### Get Mapping PLC

Virginia Villas, High Street, Hartley Witney, Hampshire RG27 8NW  
Tel: 01252 845444



**getmapping**

### Acknowledgements

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This report has been prepared in accordance with the GroundSure Ltd standard Terms and Conditions of business for work of this nature.



## Standard Terms and Conditions

### 1 Definitions

In these conditions unless the context otherwise requires:

**"Beneficiary"** means the Client or the customer of the Client for whom the Client has procured the Services.

**"Commercial"** means any building which is not Residential.

**"Commission"** means an order for Consultancy Services submitted by a Client.

**"Consultancy Services"** mean consultancy services provided by GroundSure including, without limitation, carrying out interpretation of third party and in-house environmental data, provision of environmental consultancy advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

**"Contract"** means the contract between GroundSure and the Client for the performance of the Services which arises upon GroundSure's acceptance of an Order or Commission and which shall incorporate these conditions, the relevant GroundSure User Guide, proposal by GroundSure and the content of any subsequent report, and any agreed amendments in accordance with clause 11.

**"Client"** means the party that submits an Order or Commission.

**"Data Provider"** means any third party providing Third Party Content to GroundSure.

**"Data Report"** means reports comprising factual data with no professional interpretation in respect of the level of likely risk and/or liability available from GroundSure.

**"GroundSure"** means GroundSure Limited, a company registered in England and Wales under number 03421028 and whose registered office is at Greater London House, Hampstead Road, London NW1 7EJ.

**"GroundSure Materials"** means all materials prepared by GroundSure as a result of the provision of the Services, including but not limited to Data Reports, Mapping and Risk Screening Reports.

**"Intellectual Property"** means any patent, copyright, design rights, service marks, moral rights, data protection rights, know-how, trade mark or any other intellectual property rights.

**"Mapping"** an historical map or a combination of historical maps of various ages, time periods and scales available from GroundSure.

**"Order"** means an order form submitted by the Client requiring Services from GroundSure in respect of a specified Site.

**"Order Website"** means online platform via which Orders may be placed.

**"Report"** means a Risk Screening Report or Data Report for commercial or residential property available from GroundSure relating to the Site prepared in accordance with the specifications set out in the relevant User Guide.

**"Residential"** means any building used as or suitable for use as an individual dwelling.

**"Risk Screening Report"** means one of GroundSure's risk screening reports, comprising factual data with interpretation in respect of the level of likely risk and/or liability, excluding "Consultancy Services".

**"Services"** means the provision of any Report, Mapping or Consultancy Services which GroundSure has agreed to carry out for the Client/Beneficiary on these terms and conditions in respect of the Site.

**"Site"** means the landsite in respect of which GroundSure provides the Services.

**"Third Party Content"** means any data, database or other information contained in a Report or Mapping which is provided to GroundSure by a Data Provider.

**"User Guide"** means the relevant current version of the user guide, available upon request from GroundSure.

### 2 Scope of Services

2.1 GroundSure agrees to carry out the Services in accordance with the Contract and to the extent set out therein.

2.2 GroundSure shall exercise all the reasonable skill, care and diligence to be expected of experienced environmental consultants in the performance of the Services.

2.3 The Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in the Contract.

2.4 Terms and conditions appearing on a Client's order form, printed stationery or other communication, including invoices, to GroundSure, its employees, servants, agents or other representatives or any terms implied by custom, practice or course of dealing shall be of no effect and these terms and conditions shall prevail over all others.

2.5 If a Client/Beneficiary requests insurance in conjunction with or as a result of the Services, GroundSure shall use reasonable endeavours to procure such insurance, but makes no warranty that such insurance shall be available from insurers or offered on reasonable terms. GroundSure does not endorse or recommend any particular insurance product, policy or insurer. Any insurance purchased shall be subject solely to the terms of the policy issued by insurers and GroundSure will have no liability therefor. The Client/Beneficiary should take independent advice to ensure that the insurance policy requested and/or offered is suitable for its requirements.

2.6 GroundSure's quotations/proposals are valid for a period of 30 days only. GroundSure reserves the right to withdraw any quotation at any time before GroundSure accepts an Order or Commission. GroundSure's acceptance of an Order or Commission shall be effective only where such acceptance is in writing and signed by GroundSure's authorised representative or where accepted via GroundSure's Order Website.

### 3 The Client's obligations

3.1 The Client shall ensure the Beneficiary complies with and is bound by the terms and conditions set out in the Contract and shall provide that GroundSure may in its own right enforce such terms and conditions against the Beneficiary pursuant to the Contracts (Rights of Third Parties) Act 1999. The Client shall be liable for all breaches of the Contract by the Beneficiary as if they were breaches by the Client. The Client shall be solely responsible for ensuring that the Report/Mapping ordered is appropriate and suitable for the Beneficiary's needs.

3.2 The Client shall (or shall procure that the Beneficiary shall) supply to GroundSure as soon as practicable and without charge all information necessary and accurate relevant data including any specific and/or unusual environmental information relating to the Site known to the Client/Beneficiary which may pertain to the Services and shall give such assistance as GroundSure shall reasonably require in the performance of the Services (including, without limitation, access to a Site, facilities and equipment as agreed in the Contract).

3.3 Where Client/Beneficiary approval or decision is required, such approval or decision shall be given or procured in reasonable time as not to delay or disrupt the performance of any other part of the Services.

3.4 The Client shall not and shall not knowingly permit the Beneficiary to, save as expressly permitted by these terms and conditions, re-sell, alter, add to, amend or use out of context the content of any Report, Mapping or, in respect of any Services, information given by GroundSure. For the avoidance of doubt, the Client and Beneficiary may make the Report, Mapping or GroundSure's findings available to a third party who is considering acquiring the whole or part of the Site, or providing funding in relation to the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.5 The Client is responsible for maintaining the confidentiality of its user name and password if using GroundSure's internet ordering service and accepts responsibility for all activity that occurs under such account and password.

### 4 Reliance

4.1 Upon full payment of all relevant fees and subject to the provisions of these terms and conditions, the Client and Beneficiary are granted an irrevocable royalty-free licence to access the information contained in a Report, Mapping or in a report prepared by GroundSure in respect of or arising out of Consultancy Services. The Services may only be used for the benefit of the Client and those persons listed in clauses 4.2 and 4.3.

4.2 In relation to Data Reports, Mapping and Risk Screening Reports, the Client shall be entitled to make Reports available to (i) the Beneficiary, (ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate), (iv) the first purchaser or first tenant of the Site (v) the professional advisers and lenders of the first purchaser or tenant of the Site. Accordingly GroundSure shall have the same duties and obligations to those persons in respect of the Services as it has to the Client and those persons shall have the benefit of any of the Client's rights under the Contract as if those persons were parties to the Contract. For the avoidance of doubt, the limitations of GroundSure's liability as set out in clauses 7 and 11.6 shall apply.

4.3 In relation to Consultancy Services, reliance shall be limited to the Client, Beneficiary and named parties on the Report.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise agreed in writing with GroundSure, any other party considering the information supplied by GroundSure as part of the Services, including (but not limited to) insurance underwriters, does so at their own risk and GroundSure has no legal obligations to such party unless otherwise agreed in writing.

4.5 The Client shall not and shall not knowingly permit any person (including the Beneficiary) who is provided with a copy of any Report, (except as permitted herein or by separate agreement with GroundSure) to: (a) remove, suppress or modify any trade mark, copyright or other proprietary marking from the Report or Mapping; (b) create any product which is derived directly or indirectly from the data contained in the Report or Mapping; (c) combine the Report or Mapping with, or incorporate the Report or Mapping into any other information data or service; or (d) re-format or otherwise change (whether by modification, addition or enhancement) data or images contained in the Report or Mapping.

4.6 Notwithstanding clause 4.5, if the Client acts in a professional capacity, it may make reasonable use of a Report and/or findings made as a result of Consultancy Services to advise Beneficiaries. However, GroundSure shall have no liability in respect of any opinion or report given to such Beneficiaries by the Client or a third party.

### 5 Fees and Disbursements

5.1 GroundSure shall charge the Client fees at the rate and frequency specified in the Contract together, in the case of Consultancy Services, with all proper disbursements incurred by GroundSure in performing the Services. For the avoidance of doubt, the fees payable for the Services are as set out in GroundSure's written proposal, Order Website or Order acknowledgement form. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services.

5.2 Unless GroundSure requires prepayment, the Client shall promptly pay all fees disbursements and other monies due to GroundSure in full without deduction, counterclaim or set off together with such value added tax or other tax as may be required within 30 days from the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). GroundSure reserves the right to charge interest which shall accrue on a daily basis from 30 days after the date of Payment Date until the date of payment (whether before or after judgment) at the rate of five per cent per annum above the Bank of England base rate from time to time.

5.3 In the event that the Client disputes the amount payable in respect of GroundSure's invoice it shall notify GroundSure no later than 28 days after the date thereof that it is in dispute. In default of such notification the Client shall be deemed to have agreed the amount thereof. As soon as reasonably practicable following receipt of a notification in respect of any disputed invoice, a member of the management team at GroundSure shall contact the Client and the parties shall use all reasonable endeavours to resolve the dispute.

### 6 Intellectual Property and Confidentiality

6.1 Subject to the provisions of clause 4.1, the Client and the Beneficiary hereby acknowledge that all Intellectual Property in the Services and Content are and shall remain owned by either GroundSure or the Data Providers and nothing in these terms purports to transfer or assign any rights to the Client or the Beneficiary in respect of the Intellectual Property.

6.2 The Client shall acknowledge the ownership of the Third Party Content where such Third Party Content is incorporated or used in the Client's own documents, reports, systems or services whether or not these are supplied to a third party.

6.3 Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client acknowledges that the proprietary rights subsisting in copyright, database rights and any other intellectual property rights in respect of any data and information contained in any Report are and shall remain (subject to clause 11.1) the property of GroundSure and/or any third party that has supplied data or information used to create a Report, and that these conditions do not purport to grant, assign or transfer any such rights in respect thereof to a Client and/or a Beneficiary.

6.5 The Client shall (and shall procure that any recipients of the Report as permitted under clause 4.2 shall):

(i) not remove, suppress or modify any trademark, copyright or other proprietary marking belonging to GroundSure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

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- (iii) not create any product or report which is derived directly or indirectly from the data contained in the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);
- (iv) not combine the Services with or incorporate such Services into any other information data or service; and
- (v) not reformat or otherwise change (whether by modification, addition or enhancement), data contained in the Services (save that those acting in a professional capacity to the Beneficiary shall not be in breach of this clause 6.5(v) where such reformatting is in the normal course of providing advice based upon the Services), in each case of parts (iii) to (v) inclusive, whether or not such product or report is produced for commercial profit or not.
- 6.6 The Client and/or Beneficiary shall and shall procure that any party to whom the Services are made available shall notify GroundSure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.
- 6.8 Save as otherwise set out in these terms and conditions, any information provided by one party ("Disclosing Party") to the other party ("Receiving Party") shall be treated as confidential and only used for the purposes of these terms and conditions, except in so far as the Receiving Party is authorised by the Disclosing Party to provide such information in whole or in part to a third party.
- 7 Liability**  
**THE CLIENT'S ATTENTION IS DRAWN TO THIS PROVISION**
- 7.1 Subject to the provisions of this clause 7, GroundSure shall be liable to the Beneficiary only in relation to any direct losses or damages caused by any negligent act or omission of GroundSure in preparing the GroundSure Materials and provided that the Beneficiary has used all reasonable endeavours to mitigate any such losses.
- 7.2 GroundSure shall not be liable for any other losses or damages incurred by the Beneficiary, including but not limited to:
- (i) loss of profit, revenue, business or goodwill, losses relating to business interruption, loss of anticipated savings, loss of or corruption to data or for any special, indirect or consequential loss or damage which arise out of or in connection with the GroundSure Materials or otherwise in relation to a Contract;
  - (ii) any losses or damages that arise as a result of the use of all or part of the GroundSure Materials in breach of these terms and conditions or contrary to the terms of the relevant User Guide;
  - (iii) any losses or damages that arise as a result of any error, omission or inaccuracy in any part of the GroundSure Materials where such part is based on any Third Party Content or any reasonable interpretation of Third Party Content. The Client accepts, and shall procure that any other Beneficiary shall accept, that it has no claim or recourse to any Data Provider in relation to Third Party Content; and/or
  - (iv) any loss or damage to a Client's computer, software, modem, telephone or other property caused by a delay or loss of use of GroundSure's internet ordering service.
- 7.3 GroundSure's total liability in contract, tort (including negligence or breach of statutory duty), misrepresentation, restitution or otherwise, arising in connection with the GroundSure Materials or otherwise in relation to the Contract shall be limited to £10 million in total (i) for any one claim or (ii) for a series of connected claims brought by one or more parties.
- 7.4 For the duration of the liability periods set out in clauses 7.5 and 7.6 below, GroundSure shall maintain professional indemnity insurance in respect of its liability under these terms and conditions provided such insurance is readily available at commercially viable rates. GroundSure shall produce evidence of such insurance if reasonably requested by the Client. A level of cover greater than GroundSure's current level of cover may be available upon request and agreement with the Client.
- 7.5 Any claim under the Contract in relation to Data Reports, Mapping and Risk Screening Reports, must be brought within six years from the date when the Beneficiary became aware that it may have a claim and in no event may a claim be brought twelve years or more after completion of such a Contract. For the avoidance of doubt, any claim in respect of which proceedings are notified to GroundSure in writing prior to the expiry of the time periods referred to in this clause 7.5 shall survive the expiry of those time periods provided the claim is actually commenced within six months of notification.
- 7.6 Any claim under the Contract in relation to Consultancy Services, must be brought within six years from the date the Consultancy Services were completed.
- 7.7 The Client accepts and shall procure that any other Beneficiary shall accept that it has no claim or recourse to any Data Provider or to GroundSure in respect of the acts or omissions of any Data Provider and/or any Third Party Content provided by a Data Provider.
- 7.8 Nothing in these terms and conditions:
- (i) excludes or limits the liability of GroundSure for death or personal injury caused by GroundSure's negligence, or for fraudulent misrepresentation; or
  - (ii) shall affect the statutory rights of a consumer under the applicable legislation.
- 8 GroundSure right to suspend or terminate**
- 8.1 In the event that GroundSure reasonably believes that the Client or Beneficiary as applicable has not provided the information or assistance required to enable the proper performance of the Services, GroundSure shall be entitled on fourteen days written notice to suspend all further performance of the Services until such time as any such deficiency has been made good.
- 8.2 GroundSure may additionally terminate the Contract immediately on written notice in the event that:
- (i) the Client shall fail to pay any sum due to GroundSure within 28 days of the Payment Date; or
  - (ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an Administration Order made against it or if a Receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or
  - (iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or
  - (iv) the Client or the Beneficiary breaches any material term of the Contract (including, but not limited to, the obligations in clause 4) incapable of remedy or if remediable, is not remedied within 14 days of notice of the breach.
- 9 Client's Right to Terminate and Suspend**
- 9.1 Subject to clause 10.2, the Client may at any time after commencement of the Services by notice in writing to GroundSure require GroundSure to terminate or suspend immediately performance of all or any of the Services.
- 9.2 The Client waives all and any right of cancellation it may have under the Consumer Protection (Distance Selling) Regulations 2000 (as amended) in respect of the Order of a Report/Mapping. This does not affect the Beneficiary's statutory rights.
- 10 Consequences of Withdrawal, Termination or Suspension**
- 10.1 Upon termination or any suspension of the Services, GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client/Beneficiary any property of the Client/Beneficiary in GroundSure's possession or control.
- 10.2 In the event of termination/suspension of the Contract under clauses 8 or 9, the Client shall pay to GroundSure all and any fees payable in respect of the performance of the Services up to the date of termination/suspension. In respect of any Consultancy Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination/suspension of the Contract.
- 11 General**
- 11.1 The mapping contained in the Services is protected by Crown copyright and must not be used for any purpose outside the context of the Services or as specifically provided in these terms.
- 11.2 GroundSure reserves the right to amend these terms and conditions. No variation to these terms shall be valid unless signed by an authorised representative of GroundSure.
- 11.3 No failure on the part of GroundSure to exercise and no delay in exercising, any right, power or provision under these terms and conditions shall operate as a waiver thereof.
- 11.4 Save as expressly provided in clauses 4.2, 4.3, 6.3 and 11.5, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.
- 11.5 The Secretary of State for Communities and Local Government acting through Ordnance Survey may enforce breach of clause 6.1 of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.
- 11.6 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:
- (i) the Client or Beneficiary's failure to provide facilities, access or information;
  - (ii) fire, storm, flood, tempest or epidemic;
  - (iii) Acts of God or the public enemy;
  - (iv) riot, civil commotion or war;
  - (v) strikes, labour disputes or industrial action;
  - (vi) acts or regulations of any governmental or other agency;
  - (vii) suspension or delay of services at public registries by Data Providers; or
  - (viii) changes in law.
- 11.7 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.
- 11.8 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email and on the second working day after the day of posting if sent by first class post.
- 11.9 The Contract constitutes the entire contract between the parties and shall supersede all previous arrangements between the parties.
- 11.10 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.
- 11.11 These terms and conditions shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with these terms and conditions shall be subject to the exclusive jurisdiction of the English courts.
- 11.12 If the Client or Beneficiary has a complaint about the Services, notice can be given in any format eg writing, phone, email to the Compliance Officer at GroundSure who will respond in a timely manner.

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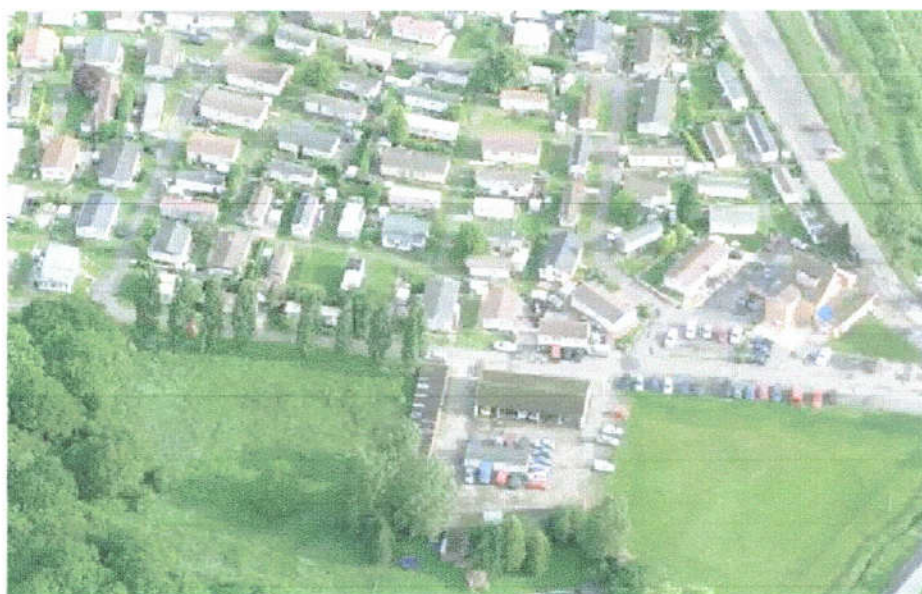


## **Appendix 3**

Photos



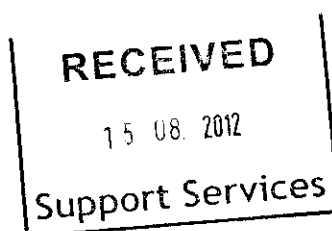
**Dome Caravan Park**



**Dome Caravan Park**

**Southwest Environmental Limited**  
 6 The Square  
 Uffculme  
 EX15 3AA  
 Telephone 01884 840 491  
 email wt@southwest-environmental.co.uk

**Client:**  
**Project No:** S12-070



**Proposed Relocation of Doctors Surgery  
Dome Caravan Park  
Hockley  
SS5 5LU**

**Draft Surface Water Management Plan**

**S12-070/FRA  
August 2012**

***Prepared by :***

**Southwest Environmental  
Limited  
6 The Square  
Uffculme  
Devon  
EX15 3AA**

***On behalf of :***

**Huggins, Bromage and Ferguson  
109 Orsett Road  
Grays  
RM17 5HA**





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## 1.0 Introduction

As part of Flood Risk Assessment for the proposed Doctors Surgery at Dome Caravan Park a Draft Surface Water Management Plan has been assembled. This document should be read in conjunction with the main flood risk assessment report S12-070/FRA.

Site Name	Proposed Doctors Surgery
Site Address	Dome Caravan Park Hockley SS5 5LU

National Grid Reference	583509,194459
-------------------------	---------------

The proposed development consists of 1no detached doctors surgery with gardens and parking, landscaping and walkways.

### 1.1 Objective

Government guidance states that;

*"The purpose of a SWMP is to make sustainable surface water management decisions that are evidence based and risk based, whilst taking climate change into account."*<sup>1</sup>

There are established surface water flooding issues in proximity to site, particularly to the west of the site. However the east of the site remains in a low risk area. Please take time to observe the plan presented in **Appendix 1**.

## 2.0 Surface Water Management at Present

At present the site is occupied by a static caravan which will have similar run off characteristics to the proposed development. However, there are no roadways and parking areas.



<sup>1</sup> <http://www.defra.gov.uk/environment/flooding/documents/manage/surfacewater/swmp-guidance.pdf>



#### **4.0 Conclusion**

Surface water management for the proposed development should be carefully managed to avoid negative impacts.

Provided the above measures are quantified by a suitably qualified individual it is suggested that surface water management can benefit run-off characteristics at the Proposed Doctors Surgery, Dome Caravan Park.

#### **5.0 Certification & Recommendations**

*For the avoidance of doubt, the parties hereby expressly agree that the Consultant takes no liability for and gives not warranty against actual flooding of The Client's property in relation to the performance of the service.*

*This report is produced for the sole use of the Client, and no responsibility of any kind, whether for negligence or otherwise, can be accepted for any Third Party who may rely upon it.*

*The conclusions and recommendations given in this report are based on our understanding of the future plans for the site.*

*The scope of this DSWMP was discussed and agreed with the Client. No responsibility is accepted for conditions not encountered, which are outside of the agreed scope of work.*

Prepared by:

**William James Thorpe BSc PGC FGS MCIWEM**

**Managing Director**



### **3.0 Surface Water Management following Site Alterations**

At a rough estimate the new develop consist of around 66% parking area, which will have run off coefficients of 0.18-0.22 and around 33% roof area 0.75 – 0.95. Parking bays and Walkways, which will utilise a permeable block paving system.

#### **3.1 Elements of proposed development that may affect attenuation rates.**

##### **3.1.1 Roadways**

There are limited roadways which interconnect the parking bays. There are also parking bays and walkways.

##### **3.1.1.1 Solutions**

Parking Bays and walk ways may utilise permeable block paving systems. Permeable Pavers have a runoff coefficient of 0.29–0.67<sup>2</sup>, which is considerably better than asphalt or concrete (0.75-0.95).

##### **3.1.2 Buildings**

Approximately 33% of the new development area will be occupied by buildings, run off from rooves creates undesirable run off characteristics.

##### **3.1.2.1 Solutions**

The roof area of the proposed development is similar to that of the existing static caravan present on site. The new development will therefore exhibit run-off characteristic close to pre development levels.

Surface waters should not be fed in to sewers.

### **3.2 Attenuation Requirements**

Current guidance, as outlined in paragraphs 1.1 above, recognises that appropriate surface water attenuation for developments can be achieved via:

*"The difference in volume pre- and post-development for the 100-year, 6-hour event (the additional runoff generated) should be disposed of by infiltration, or if this is not feasible due to ground conditions, discharged from the site at flow rates below 2l/s/ha".*

The aim of this SWMP is to avoid altogether any negative effects on attenuation rates. By following the recommendation suggested in section 3, pre-development values can be maintained, or bettered.

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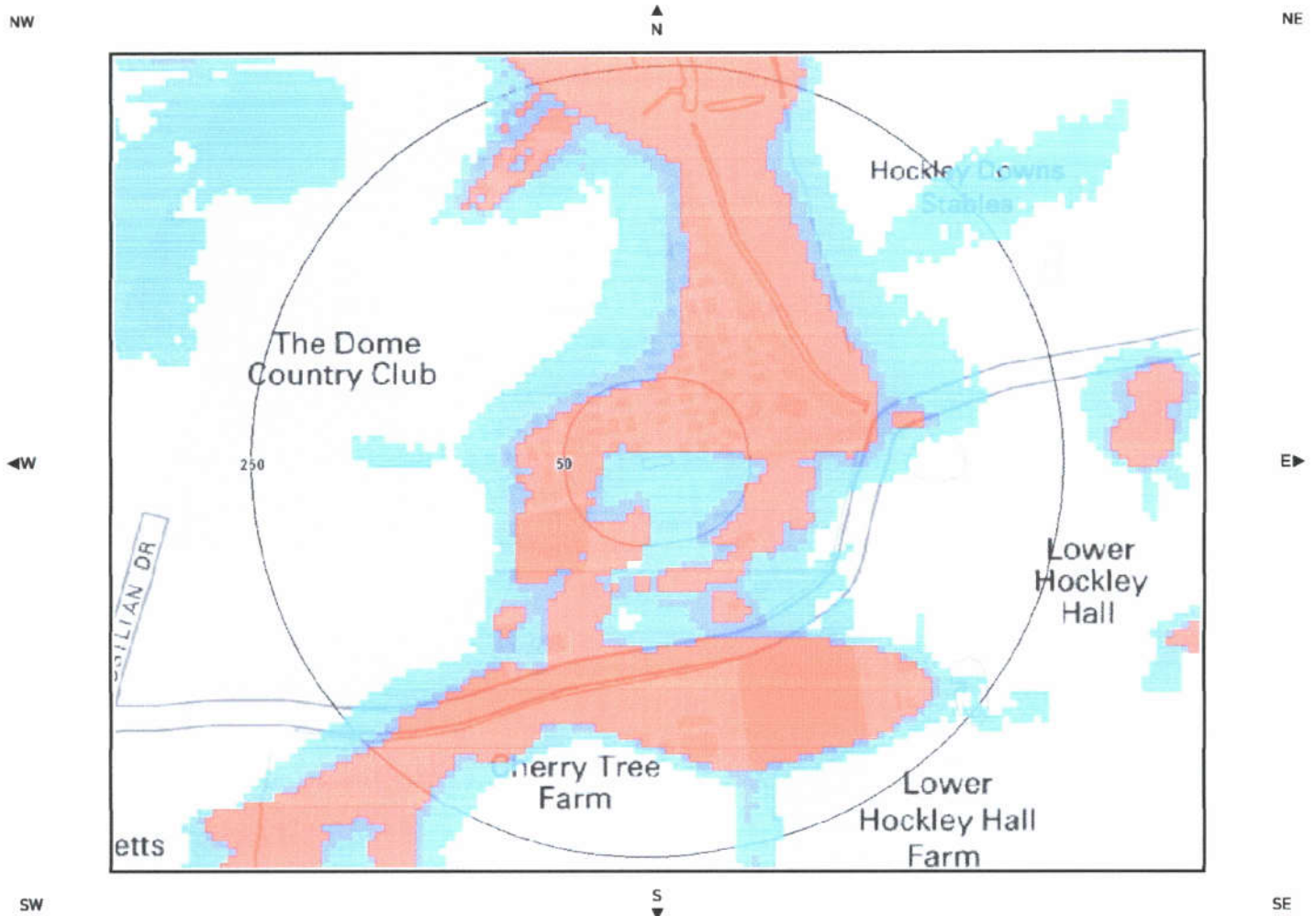
<sup>2</sup> [http://ascelibrary.org/doi/resource/1/invcff/v15/6/p475\\_s12?isAuthorized=no](http://ascelibrary.org/doi/resource/1/invcff/v15/6/p475_s12?isAuthorized=no)



## **Appendix 1**

### **Surface Water Flooding Maps**

## 4. JBA Surface Water (Pluvial) Flood Map



Surface Water (Pluvial) Flood Legend

Enabled by  
Ordnance Survey

Crown Copyright. All Rights Reserved  
Licence Number: 100035207

The data is provided by JBA Risk Management Limited, © Jeremy Benn Associates Limited and JBA Risk Management Limited 2008, 2009, 2010, 2011.



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email: [support@findmaps.co.uk](mailto:support@findmaps.co.uk) [www.findmaps.co.uk](http://www.findmaps.co.uk)

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## 4.1 JBA Surface (Pluvial) Water Flooding

Surface Water (pluvial) flooding is defined as flooding caused by rainfall-generated overland flow before the runoff enters a watercourse or sewer. In such events, sewerage and drainage systems and surface watercourses may be entirely overwhelmed.

Surface Water (pluvial) flooding will usually be a result of extreme rainfall events, though may also occur when lesser amounts of rain falls on land which has low permeability and/or is already saturated, frozen or developed. In such cases overland flow and 'ponding' in topographical depressions may occur.

### What is the risk of pluvial flooding at the study site?

**Low**

Guidance: The site or an area in close proximity has been assessed to be at Low Risk of surface water (pluvial) flooding. This indicates that this area would be expected to be affected by surface water flooding in a 1 in 1000 year rainfall event to a depth of greater than 0.1m.

This data is provided by JBA Consulting, © Jeremy Benn Associates Limited 2008/2009

The following pluvial (surface water) flood risk records within 50m of the study site are shown on the JBA Surface Water Flooding Map:

Distance	Direction	Risk
0.0	On Site	Low
3.0	N	Significant
11.0	NW	Low to Moderate
14.0	S	Low to Moderate
20.0	W	Low to Moderate
26.0	E	Low to Moderate
37.0	SE	Low to Moderate
45.0	NW	Low to Moderate

### Notes on Surface water (Pluvial) Flooding data:

JBA Consulting surface water flood map identifies areas likely to flood following extreme rainfall events, i.e. land naturally vulnerable to surface water or "pluvial" flooding. This data set was produced by simulating 1 in 75 year, 1 in 200 year and 1 in 1000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though older ones may even flood in a 1 in 5 year rainstorm event.

The model provides the maximum depth of flooding in each 5m "cell" of topographical mapping coverage. The maps include 5 bands indicating areas of increasing natural vulnerability to surface water flooding. These are:-

- 0.1m or greater in a 1 in 1,000 year rainfall event - Low
- Between 0.1m and 0.3m in a 1 in 200 year rainfall event - Low to Moderate
- Between 0.3m and 1.0m in a 1 in 200 year rainfall event - Moderate
- Greater than 1.0m in a 1 in 200 year rainfall event - High
- Greater than 0.1m in a 1 in 75 year rainfall event - Significant