Brooklands Barn Garage, Bodicote

Flood Risk Assessment

Solid Job No: **1669S**
Solid Doc Ref: **BBG-SOLID-XX-XX-RP-C-0002**
Date: **05/08/2019**

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PROJECT DETAILS	
Title: Flood Risk Assessment	
Solid Job No: 1669S	**Solid Doc Ref:** BBG-SOLID-XX-XX-RP-C-0002
Date: 05/08/2019	**Status:** S2 – For Information
Rev: P02	**Issued by:** ARD

CONTENTS

APPROVAL

Prepared by:	Reviewed by:	Approved by:
Diane Ochse - Engineer	Arge Rivera - Associate	Arge Rivera - Associate

REVISION HISTORY

Rev:	Comment:	Approved by:
Rev:	Comment:	Approved by:
Rev:	Comment:	Approved by:

INSTRUCTION AND WARRANTY

Solid Structures Ltd has prepared these calculations in accordance with the instruction given by Mr &Mrs Bratt ("The Client").

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1 INTRODUCTION

Appointment and Brief

1.1 Solid Structures has been appointed by Mr. Bratt to undertake a Flood Risk Assessment (FRA) for the Brooklands Barn Garage, Bodicote.

Objective and Scope of this report

1.2 The objective of this FRA is to identify the source of potential flood risk to the site. This report also investigates the geology, topography, hydrology and drainage regime of the site at a desk top level.

1.3 To achieve this objective the following documents have been consulted and/or referenced:

- The National Planning Policy Framework (NPPF)
- Oxfordshire County Council, Local Flood Risk Management Strategy (LFRMS)
- Aerial photographs and topographical survey of the site
- British Geological Society Records
- Environment Agency flood maps
- Level 4 flood information

2 SITE ASSESSMENT

Existing Site

2.1 The proposed Barn is situated on the side of a valley along Church Street, post code OX15 4DR, coordinates X(Easting):446037; Y(Northing): 237195. The development is bordered on Fairholme House to the east. Access to the site is via Church Street. Refer to figure 1 for details and appendix A.

Figure 1: Existing Site (Left). Proposed Site Location (right)

Hydrogeology, Geology and Hydrology of the site

2.2 The ground conditions are based on the trial pit carried out on site and the British Geological Society records. An overview of the finding is shown below. Refer to **appendix B** for the site ground condition records.

2.3 Hydrogeology

Aquifer	The development is outside of an aquifer zone.
Source Protection Zone	The site is not located within a Source Protection Zone.
Ground Water Levels	No record
Groundwater Flooding Incidents	No record

2.4 Geology

Bedrock & Superficial Deposits	Bedrock: Charmouth Mudstone Formation – Mudstone & Durham Formation – Siltstone and Mudstone Interbedded. Superficial Deposits: Alluvium – Clay, Silt Sand and Gravel.
Soakaway Potential	The soils are considered to be effectively permeable and likely to be conducive to infiltration systems. The two soakaway tests confirm this. The 2 soakaway test pits investigation was carried out by B C Coleman Contracting dated 03/07/19.
Contaminated Land	No records

2.5 Hydrology

Surface Water	The Sor Brook is 140m from the Barn.
Existing Flood Defences	The site is not protected by flood defences.
Surface water drainage network	No records

Proposed Development

2.6 The proposed development comprises of one garage/maintenance building west to the existing house.

2.7 The estimated lifetime of the proposed development is likely to be between 50-100 years.

3 FLUVIAL FLOOD RISK ASSESSMENT AND MITIGATION STRATEGIES

RISK ASSESSMENT

Site in relation to the flood zones

3.1 The Environment Agency's level 4 information is not available for this site. Nevertheless the EA's Flood Zone Map indicates that the site is located within flood Zone 2 which is a zone of low to medium flooding.

3.2 Reviewing the Environment Agency map, it is apparent that the flood zone contours only follow the ground profile in the downstream section of the Sor Brook. The new development is located in the upper section of the river where the contours of the flood zone follow random points that do not correspond to the ground profile.

3.3 Looking at the flood zone contours in the downstream section, it is safe to assume that the zone 2 level will below the 99.5m AOD level. Therefore, the site is located within flood zone 1. See EA's Indicative Flood Zone Map Appendix C.

3.4 The proposed final floor level of the building is 100.06m AOD with the access road being at 99.75m AOD. The access road is the lowest point in the development and it is still outside of flood zone 2. Therefore the whole site is likely to be within zone 1.

NPPF - Flood Zones & Flood Zone Development Compatibility

3.5 The new building contains garages, kitchenette and toilet. The flood risk vulnerability for this type of use is "Less Vulnerable"

3.6 Table 3 -Flood Risk vulnerability and Flood Zone Compatibility- of the NPPF Planning Practice Guide identifies that a 'less Vulnerable' **development within Zone 1 is considered to be appropriate**.

FLUVIAL FLOOD RISK MITIGATION STRATEGIES

Site Layout and Design

3.7 The layout for this development is based on the flood risk assessment requirements given by the environment agency. The FFL for the garage will be 100.06m AOD this level is 560mm above

the level of the flood zone 2. The access road will be at level 99.7m AOD approximately. The access road provides a safe access and evacuation corridor for the site.

Modification of Ground Levels and flood Compensation

3.8 The existing ground levels with the site will be modified to create a level access across the site. There is no a requirement to provide flood compensation storage as these ground modifications are outside of the flood 2.

4 OTHER SOURCES OF FLOODING RISK ASSESSMENT AND MITIGATION

4.1 The additional potential flood risks were determined by identifying the sources of flooding and assessing their possible impact. Table 2 provides an overall summary of the potential risk to the development.

Table 2: Other sources of flooding assessment and mitigation

Source of Flooding	Assessment	Flood Risk Reduction & Mitigation
Surface water (overland flows)	The records show that the site is outside of any surface water overland flows. **See Appendix C**	Based on the permeability tests the proposed SUDS will be able to reduce the post development surface water runoff.
Flooding from Groundwater	There are no records of flooding within the site. **See Appendix C**	No mitigation is required
Tidal/coastal	The site is not near the coast	Not applicable
Canals	The site is not near a canal	Not applicable
Reservoirs	The records show that the site is outside of the path of reservoirs. **See Appendix C**	No mitigation is required
Flooding from sewers	The site doesn't have a public sewer in the proximity. All flow are being pumped to the existing sewer located upstream of the site.	No mitigation is required

5 CONCLUSIONS

5.1 This Flood Risk Assessment has been prepared in accordance with National Planning Policy Framework. The sequential test confirmed that the proposed development is appropriate within Flood Zone 1 and therefore an exception test is not required. The site is considered to be at low risk of flooding from all other potential sources.

5.2 This Flood Risk Assessment demonstrates that the development proposals are appropriate and will not increase the flood risk elsewhere. Refer to the drainage strategy document for details on Sustainable Drainage systems. In conclusion, the development proposals are considered to comply with the National Planning Policy Framework.

APPENDICES

Appendix A - Existing and Proposed Development

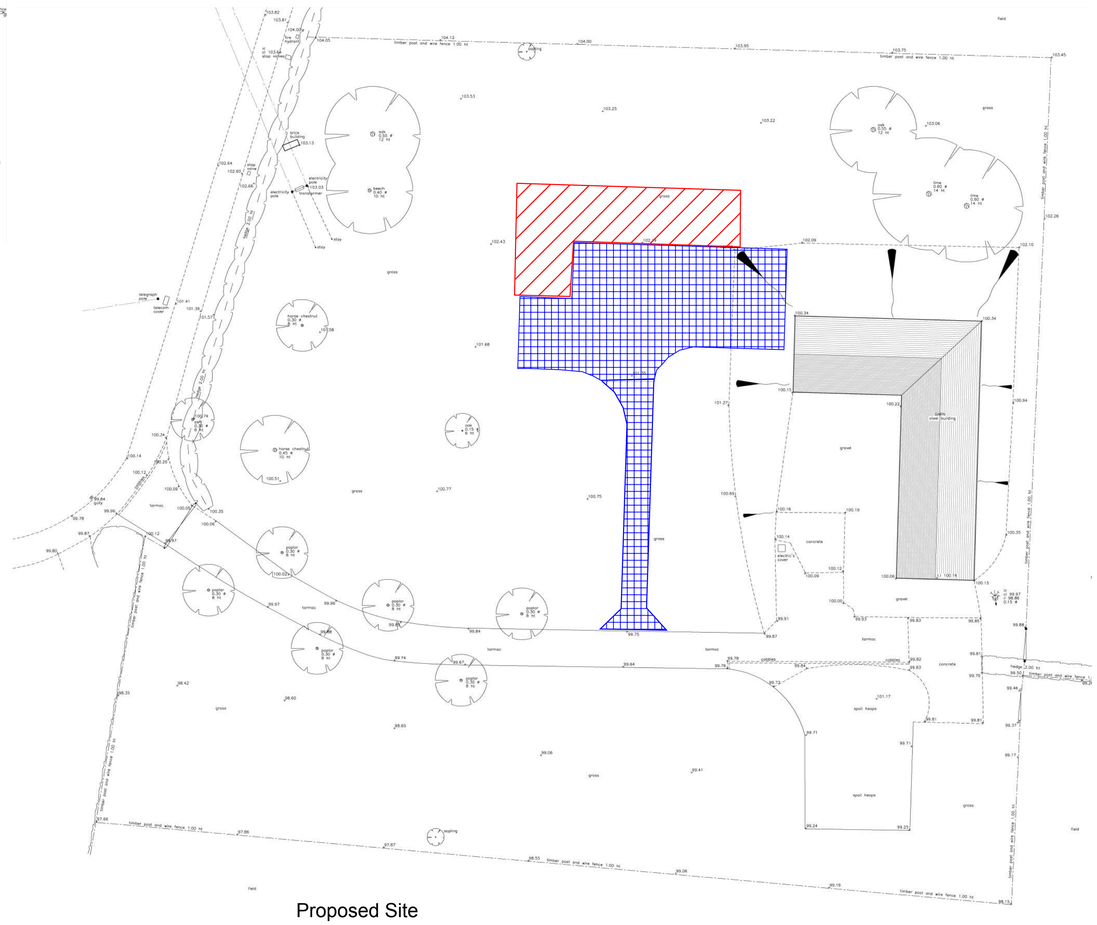
Appendix B - Site Ground Conditions

Appendix C - Flood Risks Record

Appendix A: Existing and Proposed Development Area

Existing Site

1



Proposed Site

NOTES

1. All Structural Engineer's drawings are to be read in conjunction with all relevant Architect's & Services Engineer's drawings and specifications.

KEY:

Proposed New Permeable Surface

Proposed New Impermeable Surface

P01	Issued for Planning Approval	30.07.19	DO	ARD
Rev	Description	Date	By	Chkd

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Project

Brooklands Barn Garage
Bodicote

Drawing Title

Existing and Proposed Developed Areas

Scale

NTS @ A1

Role

Civil

Status / Stage

S4- For Planning Approval

Job No

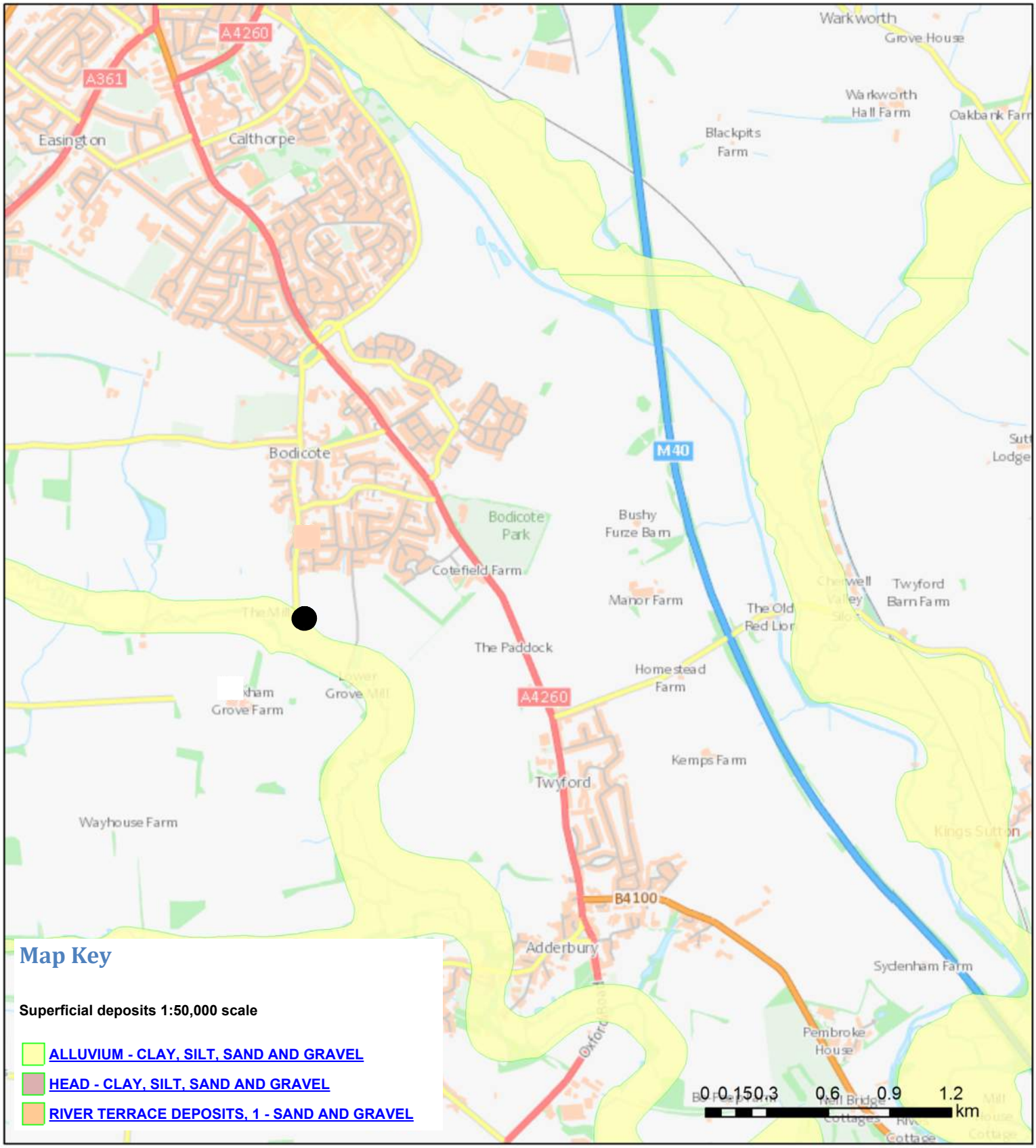
1669S

Ref	Org	Zone	Level	Type	Role	Number	Rev
BBG	SOLID	XX	UD	DR	C	6000	P01

Appendix B
Site Ground Conditions

GeoIndex Report

GEOINDEX ONSHORE



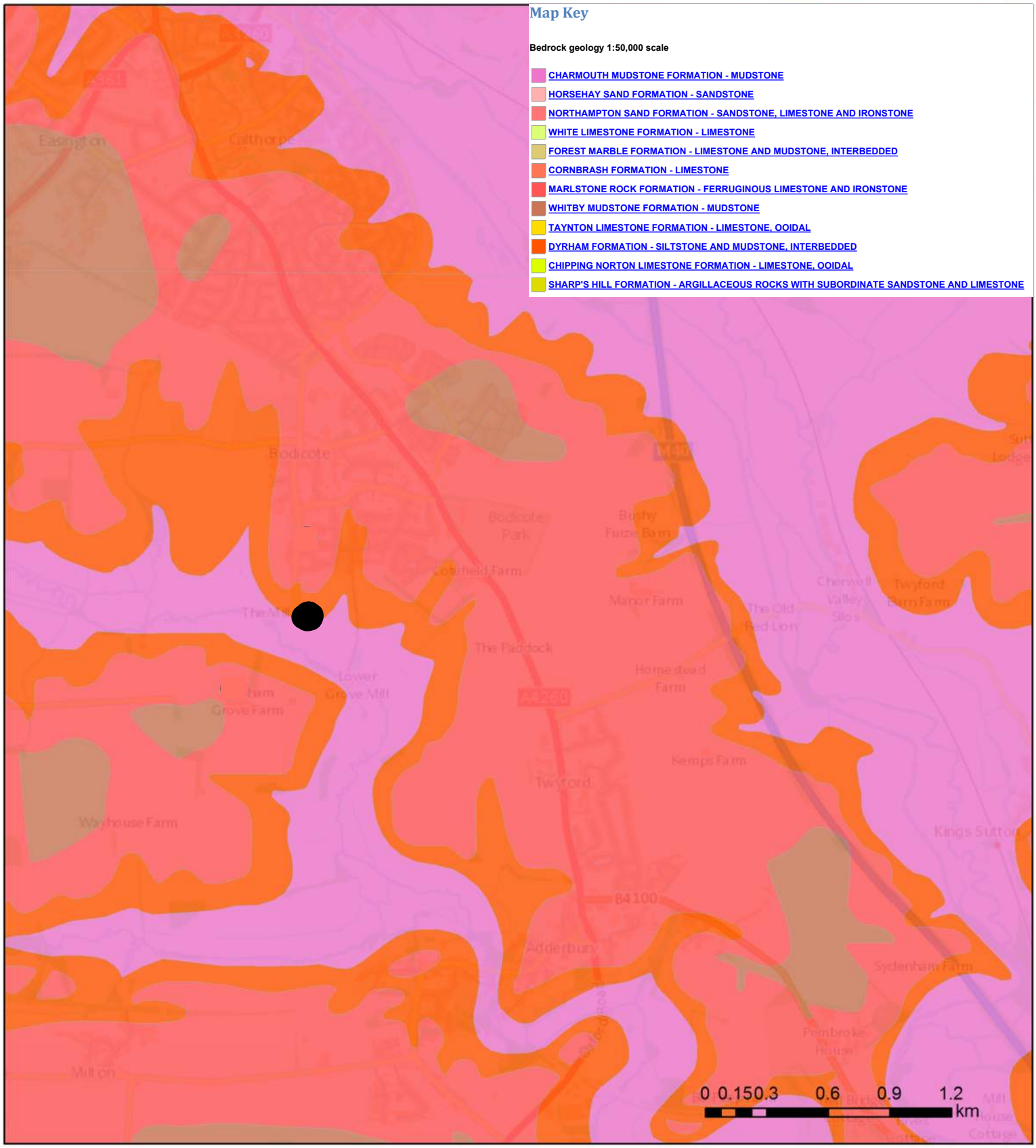
Map Key

Superficial deposits 1:50,000 scale

- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL
- HEAD - CLAY, SILT, SAND AND GRAVEL
- RIVER TERRACE DEPOSITS, 1 - SAND AND GRAVEL

GeoIndex Report

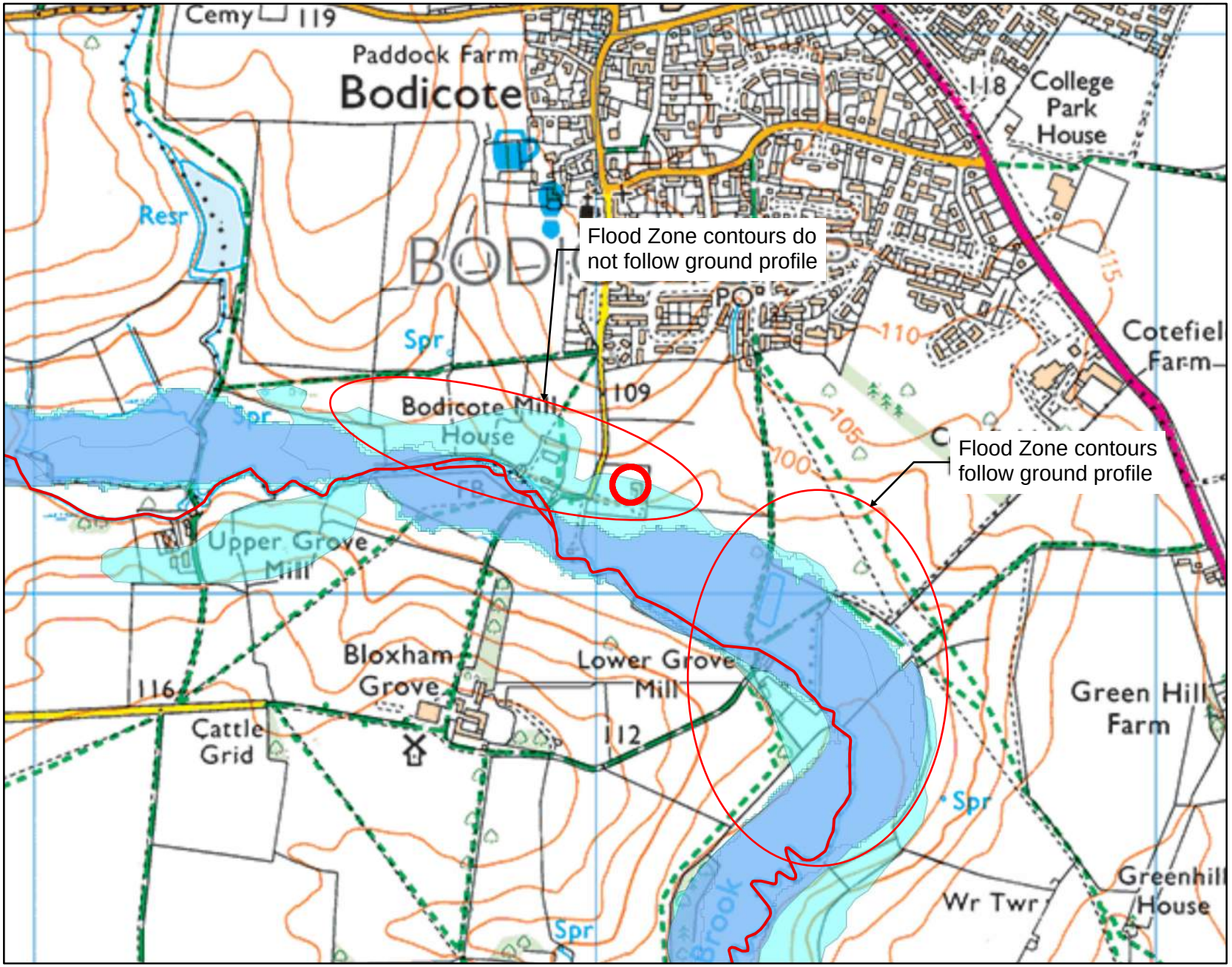
GEOINDEX ONSHORE



GeoIndex Onshore Data Sources: NERC, Natural England, English Heritage and Ordnance Survey

Appendix C:
Flood Risks Record Drawings

Flood Map for Planning centred on OX15 4DT
Created on 22/7/19 REF: THM133475



Environment Agency

Kilometres

0 0.25 0.5

Legend

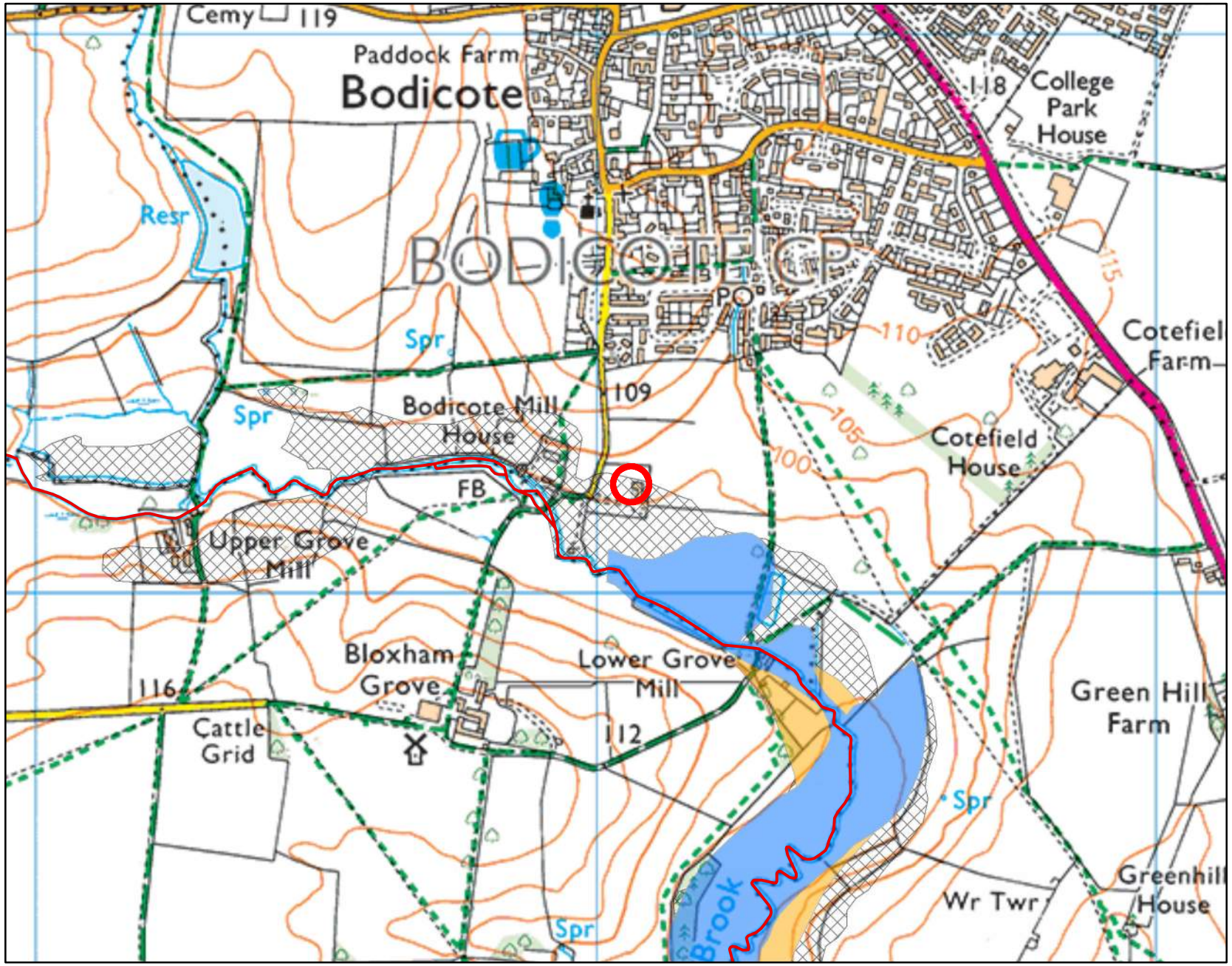
- Main River
- Flood defences
- Areas benefiting from flood defences
- Flooding from rivers or sea (FZ3)
- Extent of extreme flood (FZ2)
- Flood Map - flood storage areas

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Historic Flood Map centred on OX15 4DT
Created on 22/7/19 REF: THM133475



Environment Agency

Kilometres

0 0.25 0.5

Legend

Main River

year

1992
1993
1998
2007

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

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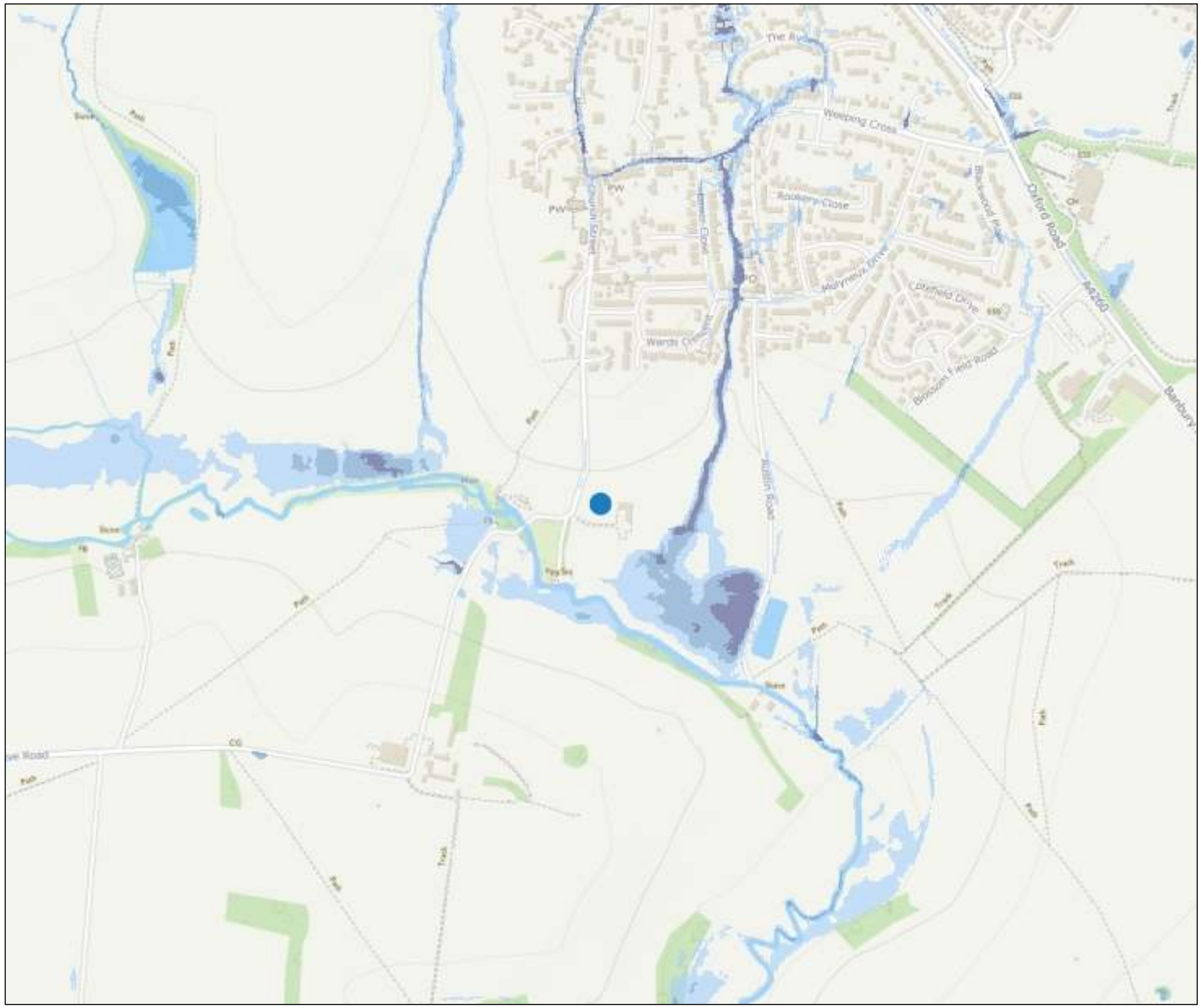
Risk of flooding from Surface Water centred on OX15 4DT Created 25/7/19 Ref: THM133475



Environment Agency

Scale 1:10,000

N
W E
S

Likelihood of flooding from Surface Water

- High (>= 3.3%)
- Medium (3.3% - 1%)
- Low (1% - 0.1%)
- Very Low

Likelihood of flooding from Surface Water

High:	Greater than or equal to 3.3% (1 in 30) chance in any given year
Medium:	Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
Low:	Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
Very Low:	Less than 0.1% (1 in 1,000) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on our website.

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FLOOD RISK FROM RESERVOIRS