Flood Risk Assessment

Riverside House, 2 Fitzalan Road, Arundel BN18 9JS

Ms Bertille Guilbert-Burrows
Riverside House
2 Fitzalan Road
Arundel
BN18 9JS
Ref: 12623
Date: July 2025

Index

Schedule of Appendices

1 Existing Site and Current Flood Conditions

1.1 The application site lies within the area administered by Arun District Council (ADC). It comprises a detached dwelling house with a landscaped garden and brick drive. A site location map and an aerial photo are shown in Appendix A.

1.2 Topography: a topographic survey was undertaken – refer to Appendix C. The external levels range between 3.43m AOD and 3.09m AOD, with the lowest threshold (ground floor level) at 3.59m AOD. The tow path levels to the north are 2.39m and 2.43m AOD and the levelsalong the road are slightly lower than within the site at approximately 2.9m AOD.

1.3 Hydrology: The River Arun (tidally affected to Pallingham Quay near Pulborough), flows in a broadly north-south direction very close to the site's north boundary. The English Channel is approximately 5.75km to the south.

1.4 Geology: the BGS's online geology map shows that the bedrock is Spetisbury Chalk Member with Raised Marine Deposits (clay, silt, sand and gravel) overlying this solid bedrock. Although the Chalk soil type may possess reasonable to high soakage potential, the combination of high probable clay content in the drift layer and likely high water table level, this would preclude the use of infiltration features.

1.5 Tidal flooding: the EA's fluvial flood map in Appendix B indicates with the exception of sections on the north and south boundaries – which are located in Flood Zone 3 (FZ3 – High Risk) - the majority of the site is located in FZ1 (Low Risk). Tidally affected sites in FZ3 are liable to flood with an Annual Exceedance Probability (AEP) of greater than once every 200 years on average (>0.5%). Sites in Tidally affected ZF1 are susceptible to flood with an AEP of less than 1 in 1000 years (<0.1%). The orange line along the west boundary denotes a flood defence structure.

1.6 Predicted sea level rise (climate change): the EA expects new developments affected by coastal/tidal flooding to consider the predicted sea level rise up to year **2125** for developments with design lives of 100 years, ie the 2110 scenario is not accurate. The EA's online guidance states the annual predicted sea level rise over this 15 year period is 13.1mm/yr - this being the **Higher End Allowance** as set out for the South East in Table 1 of the EA's "Climate Change Allowances" webpage. 15 x 13.1 = **197mm**. The critical flood level is therefore 3.58 + 0.197 = **3.78m AOD**. (It is contended that the Higher Central Allowance is appropriate here given the protection provided by the defences. In addition all bedrooms will be at high level.

1.7 Surface water flooding: this occurs when excess rainwater does not infiltrate into the ground or is not intercepted. The EA's Online 'Surface Water Depth - Low Risk Scenario' (1 in 1000 years) Flood Map (see Appendix B) shows the site is not liable to flood from this source.

1.8 Artificial sources: flooding from reservoirs, canals and docks. The EA's Reservoirs Flood Map in Appendix B shows that the site is liable to flood when a reservoir suffers a catastrophic breach – 'when there is also flooding from rivers.' This would potentially emanate from the ponds at the Arundel Wetland Centre, approximately 850m to the north of the site.

1.9 Historical Flooding: the site is removed from the nearest recorded Historic Flood – according to the EA's Historic Flood Map in Appendix B.

1.10 Groundwater Flooding: The EA's Groundwater Vulnerability (GWV) Zone map and Groundwater Source Protection Zone map (both in Appendix B) show the site overlies a 'Medium-High' GWV Zone and is removed from the nearest Groundwater Source Protection Zone.

1.11 In conclusion, the flood risk profile of this site is **High**.

2 Proposed Development & Mitigation

2.1 The proposed scheme is to extend the dwelling house onto the office and the utility room.Refer to the layout drawings in Appendix C.

2.2 As summarized in section 1.11 above, the flood risk profile of the building is 'High'.

2.3 Vulnerability and the Sequential Test: the vulnerability classification of any new development should be considered. According to Table 2 of the NPPF, dwelling units are rated as 'More Vulnerable'. With the extension, there is an increase in scale. But the increase is only 50.5sqm in the loft space.

2.4 Table 3 of the NPPF states that More Vulnerable uses, such as dwellings, must pass the Sequential and/or Exception Tests in FZ3A. This procedure is outside the remit of this report. Figure 1 below shows this table:

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.

Notes to table 3:
This table does not show:
a. the application of the Sequential Test which guides development to Flood Zone 1 first, then Zone 2, and then Zone 3;
b. flood risk assessment requirements; or
c. the policy aims for each flood zone.

Figure 1: Table 3 of the NPPF

2.5 Sequential Testing procedures lie outside our skill set. This report demonstrates that the developed site will be safe, ie this passes the second part of the Exception Test.

2.6 Safe Access To Dry Land: In order to comply with the NPPF, all occupants must be able to make their way, unassisted by the Emergency Services, to dry land. This is known as 'safe access to dry land' and it does not have to be dry, just not *hazardous* (safe).

3 Sustainable Surface Water Drainage Design

3.1 One of the main tenets of the PPG is for new developments *not* to increase the flood risk of neighbouring/downstream properties. CIRIA's SuDS hierarchy has been applied here to determine how the development's surface water should be dealt with, this being:-

- Infiltration to ground, namely features such as soakaways, infiltration trenches and the like;
- Discharging to a watercourse;
- Discharging to a public sewer.

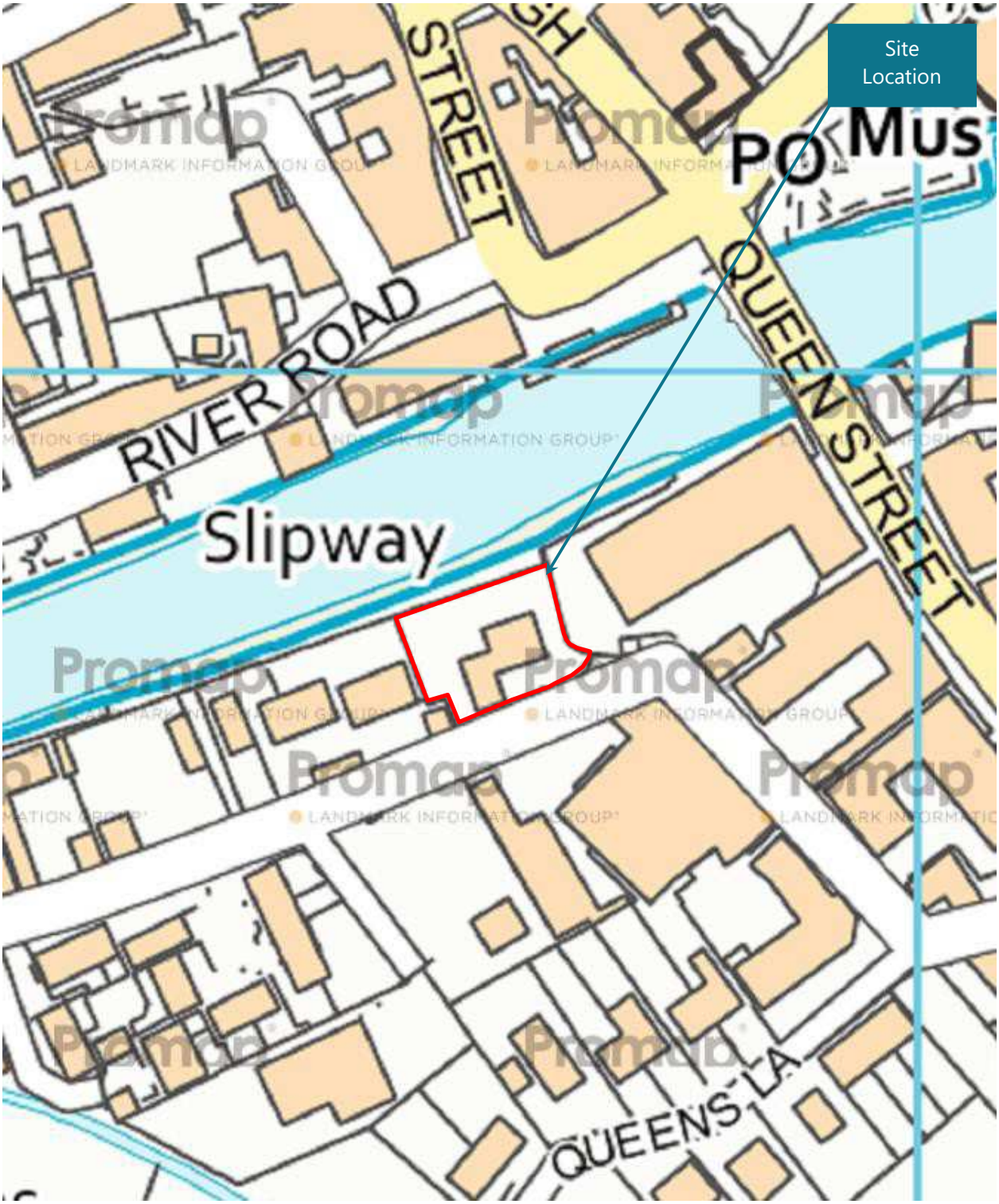
3.2 The proposed extension will not increase the surface water (it will be the same).

3.3 Conclusion: this development will not increase the flood risk either on this site or to neighbouring properties - and so complies with the 2023 NPPF and 2022 PPG.

- End of Report -

Appendix A

Site Location Map & Aerial Photo




Site
Location

Appendix B

Environment Agency Flood Risk Data

EA's Online Flood Map for Planning (Rivers and Seas)

With the exception of sections of the north and south boundaries – which are located in Flood Zone 3 (FZ3) - the majority of the site is located in FZ1

Our ref: SSD313225

Dear...

Enquiry Regarding Product 4 for Flood Risk Assessment for Riverside House, 2 Fitzalan Road, Arundel, BN18 9JS.

Thank you for your enquiry.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004. The information is attached.

The information on Flood Zones in the area relating to this address is as follows:

The site is in an area located within Flood Zones 1, 2 and 3 as shown on our Flood Map for Planning (Rivers and Sea).

Note - This information relates to the area that the above named property is in and is not specific to the property itself as it is influenced by factors such as the height of door steps, air bricks or the height of surrounding walls. We do not have access to this information and is not currently used in our flood modelling.

Flood Zone definitions can be found at www.gov.uk/guidance/flood-risk-and-coastal-change#Table-1-Flood-Zones

Flood Defences
There are flood defences raised in the vicinity of the site in the form of embankments along the course of the River Arun (Asset ID: 155418).

Model Information
The model used was the Lower Tidal River Arun Strategy Study which was completed by Atkins in 2010.

Flood History
We hold no record of previous flooding events affecting this site.

Please note our records are not comprehensive and may not include all events. I recommend contacting the Lead Local Flood Authority, **West Sussex County Council** or the Local Authority, **Arun District Council** for a more comprehensive flood history check.

FRA advisory text

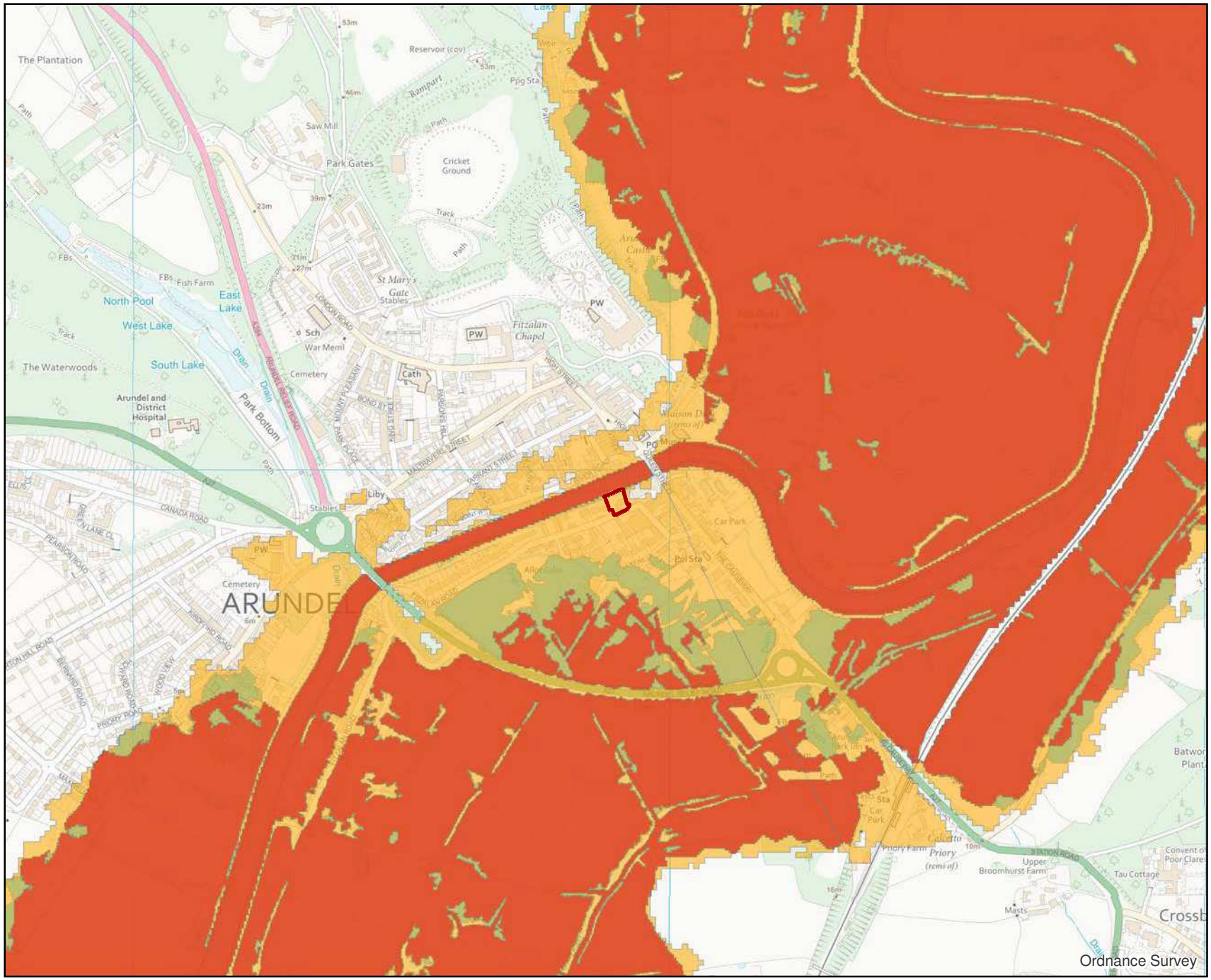
Name	Product 4
Description	Detailed Flood Risk Assessment Map for **Riverside House, 2 Fitzalan Road, Arundel, BN18 9JS.**
Licence	Open Government Licence
Information Warnings	The flood risk data provided is based on existing EA hydraulic models with an allowance for climate change. Please note the climate change allowances provided are not up to date. These were updated on 27 July 2021. You should refer to 'Flood risk assessments: climate change allowances' for the most up to date allowances. You will need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
Information Warning - OS background mapping	*The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.*
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2020 Ordnance Survey 100024198.

Data Available Online

Many of our flood datasets are available online:

- Flood Map For Planning (Flood Zone 2, Flood Zone 3 ,Flood Storage Areas, Flood Defences, Areas Benefiting from Defences)
- Risk of Flooding from Rivers and Sea
- Historic Flood Map
- Current Flood Warnings

Modelled Flood Outlines (Defended Tidal). Centred BN18 9JS. Created 29/06/2023.



Environment Agency

Legend

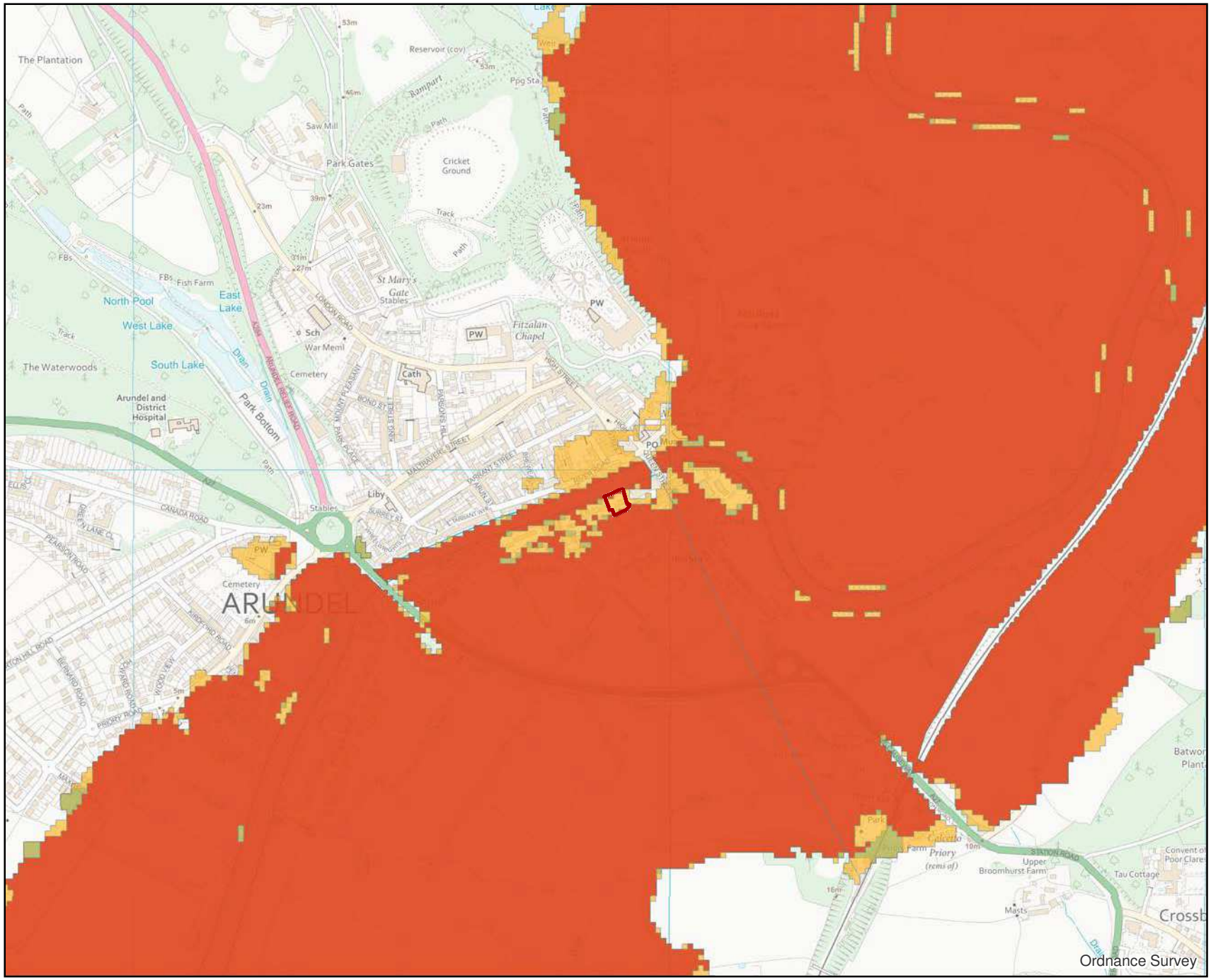
- Site Boundary
- 0.5% AEP (Defended Tidal)
- 0.5% AEP (2110) (Defended Tidal)
- 0.1% AEP (Defended Tidal)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000

0 0.225 0.45
Kilometers

Modelled Flood Outlines (Undefended Tidal). Centred BN18 9JS. Created 29/06/2023.



Environment Agency

Legend

- Site Boundary
- 0.5% AEP (Undefended Tidal)
- 0.5% AEP (2110) (Undefended Tidal)
- 0.1% AEP (Undefended Tidal)

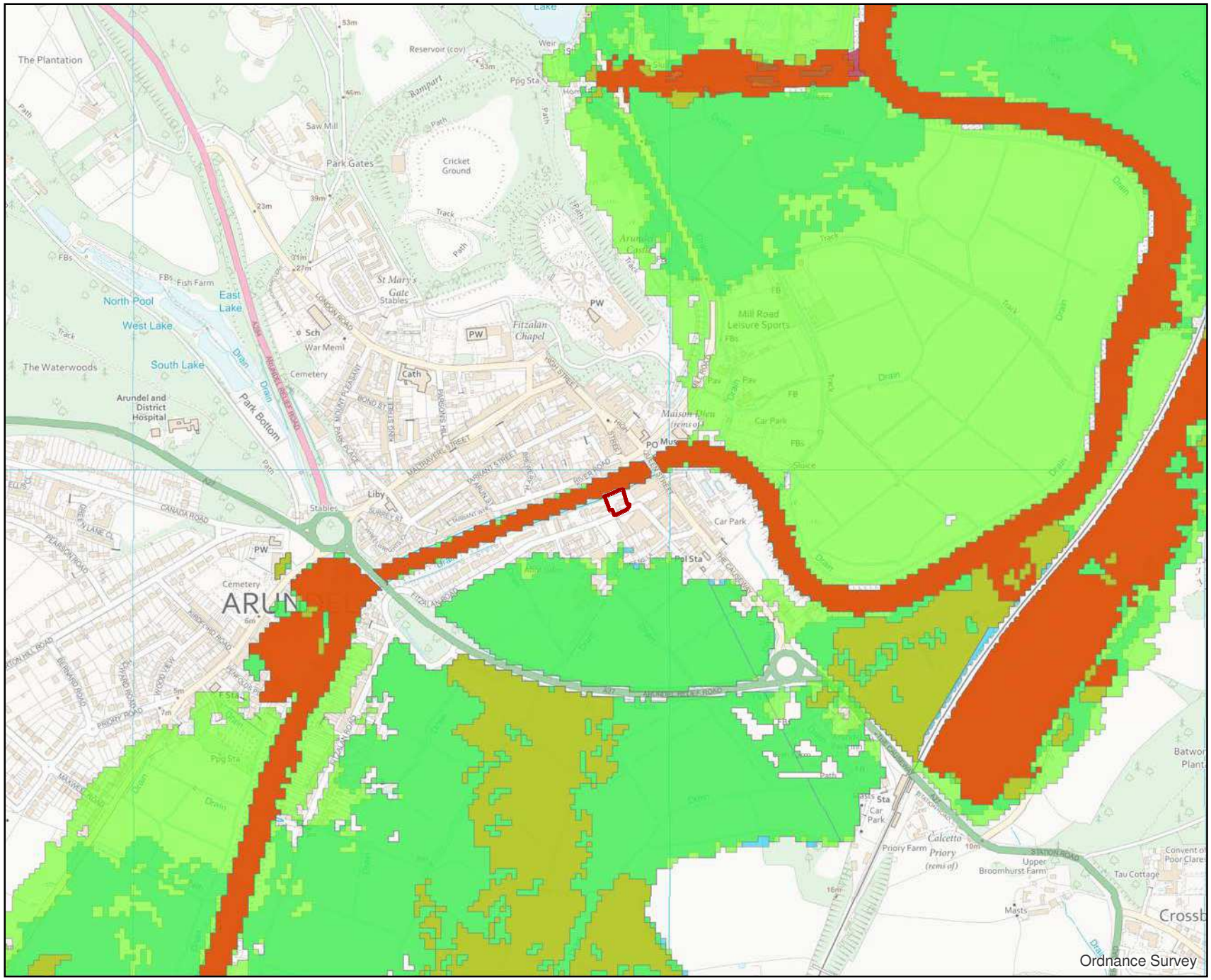
Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000

0 0.225 0.45
Kilometers

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

Modelled Flood Outlines (Defended Fluvial). Centred BN18 9JS. Created 29/06/2023.



Environment Agency

Legend

- Site Boundary
- 5% AEP (Defended Fluvial)
- 1% AEP (Defended Fluvial)
- 1% AEP +CC (Defended Fluvial)
- 0.1% AEP (Defended Fluvial)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000

0 0.225 0.45
Kilometers

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

Modelled Flood Outlines (Undefended Fluvial). Centred BN18 9JS. Created 29/06/2023.

Environment Agency

Legend

- Site Boundary
- 5% AEP (Undefended Fluvial)
- 1% AEP (Undefended Fluvial)
- 1% AEP +CC (Undefended Fluvial)
- 0.1% AEP (Undefended Fluvial)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000

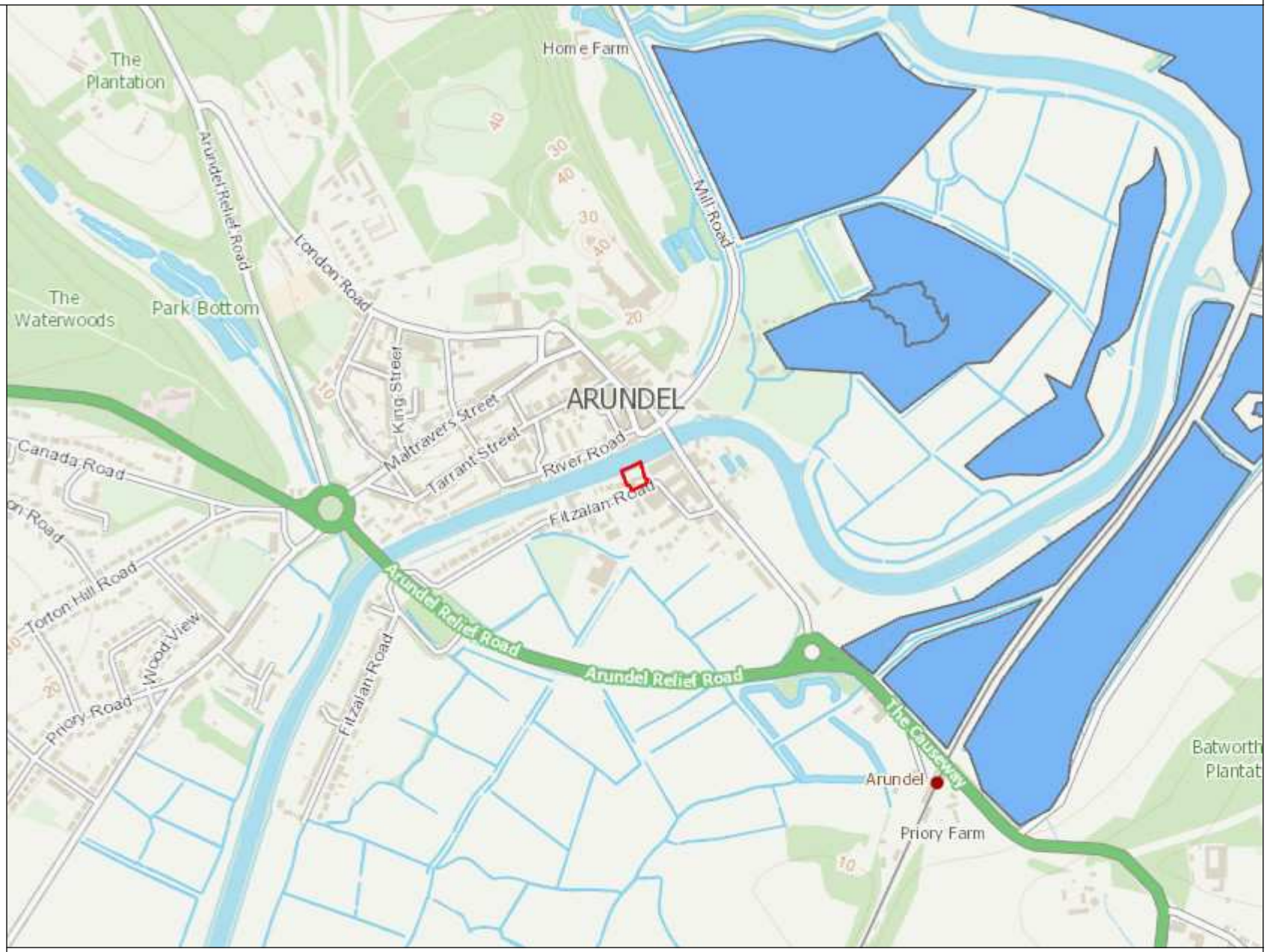
0 0.225 0.45
Kilometers

Recorded Flood Outlines. Centred BN18 9JS. Created 29/06/2023.

Environment Agency

Legend

All recorded flood outlines



1: 10,000

0 250

Metres

N W E S

Product 4 Flood Risk Data

Site: Riverside House, 2 Fitzalan Road, Arundel, BN18 9JS

Table 1: Water Levels: Fluvial Undefended

	NGR		Modelled Flood Levels in Metres AOD Undefended Annual Exceedance Probability			
Node Ref	Eastings	Northings	5%	1%	1% +CC*	0.1%
1	501886	106950	-	-	3.33	2.91
2	501911	106962	-	-	3.33	2.91
3	501902	106948	-	-	3.33	2.91
4	501892	106929	-	-	3.33	2.91
5	501911	106939	-	-	3.33	2.91
6	501903	106926	-	-	3.33	2.91
7	501921	106930	-	-	3.33	2.91

Table 2: Water Levels: Fluvial Defended

	NGR		Modelled Flood Levels in Metres AOD Defended Annual Exceedance Probability			
Node Ref	Eastings	Northings	5%	1%	1% +CC*	0.1%
1	501886	106950	-	-	-	-
2	501911	106962	-	-	-	-
3	501902	106948	-	-	-	-
4	501892	106929	-	-	-	-
5	501911	106939	-	-	-	-
6	501903	106926	-	-	-	-
7	501921	106930	-	-	-	-

Table 3: Water Levels: Tidal Undefended

	NGR		Modelled Flood Levels in Metres AOD Undefended Annual Exceedance Probability		
Node Ref	Eastings	Northings	0.5%	0.5% (2110)**	0.1%
1	501886	106950	2.93	3.58	3.00
2	501911	106962	2.93	3.58	3.00
3	501902	106948	2.93	3.58	3.00

4	501892	106929	2.93	3.58	3.00
5	501911	106939	2.93	3.58	3.00
6	501903	106926	2.93	3.58	3.00
7	501921	106930	2.93	3.58	3.00

Table 4: Water Levels: Tidal Defended

	NGR		Modelled Flood Levels in Metres AOD		
			Defended Annual Exceedance Probability		
Node Ref	**Eastings**	**Northings**	**0.5%**	**0.5% (2110)****	**0.1%**
1	501886	106950	-	3.50	-
2	501911	106962	-	3.50	-
3	501902	106948	-	3.50	-
4	501892	106929	-	3.50	-
5	501911	106939	-	3.50	-
6	501903	106926	-	3.50	-
7	501921	106930	-	3.50	-

Table 5: Water Depths: Fluvial Undefended

	NGR		Modelled Flood Depths in Metres			
			Undefended Annual Exceedance Probability			
Node Ref	**Eastings**	**Northings**	**5%**	**1%**	**1% +CC***	**0.1%**
1	501886	106950	-	-	2.05	1.62
2	501911	106962	-	-	2.24	1.92
3	501902	106948	-	-	2.24	1.92
4	501892	106929	-	-	1.45	1.02
5	501911	106939	-	-	2.24	1.92
6	501903	106926	-	-	1.45	1.02
7	501921	106930	-	-	2.24	1.92

Table 6: Water Depths: Fluvial Defended

	NGR		Modelled Flood Depths in Metres			
			Defended Annual Exceedance Probability			
Node Ref	**Eastings**	**Northings**	**5%**	**1%**	**1% +CC***	**0.1%**
1	501886	106950	-	-	-	-
2	501911	106962	-	-	-	-
3	501902	106948	-	-	-	-
4	501892	106929	-	-	-	-
5	501911	106939	-	-	-	-
6	501903	106926	-	-	-	-
7	501921	106930	-	-	-	-

Table 7: Water Depths: Tidal Undefended

	NGR		Modelled Flood Depths in Metres Undefended Annual Exceedance Probability		
Node Ref	**Eastings**	**Northings**	**0.5%**	**0.5% (2110)****	**0.1%**
1	501886	106950	1.65	2.29	1.71
2	501911	106962	1.84	2.49	1.91
3	501902	106948	1.84	2.49	1.91
4	501892	106929	1.05	1.69	1.11
5	501911	106939	1.84	2.49	1.91
6	501903	106926	1.05	1.69	1.11
7	501921	106930	1.84	2.49	1.91

Table 8: Water Depths: Tidal Defended

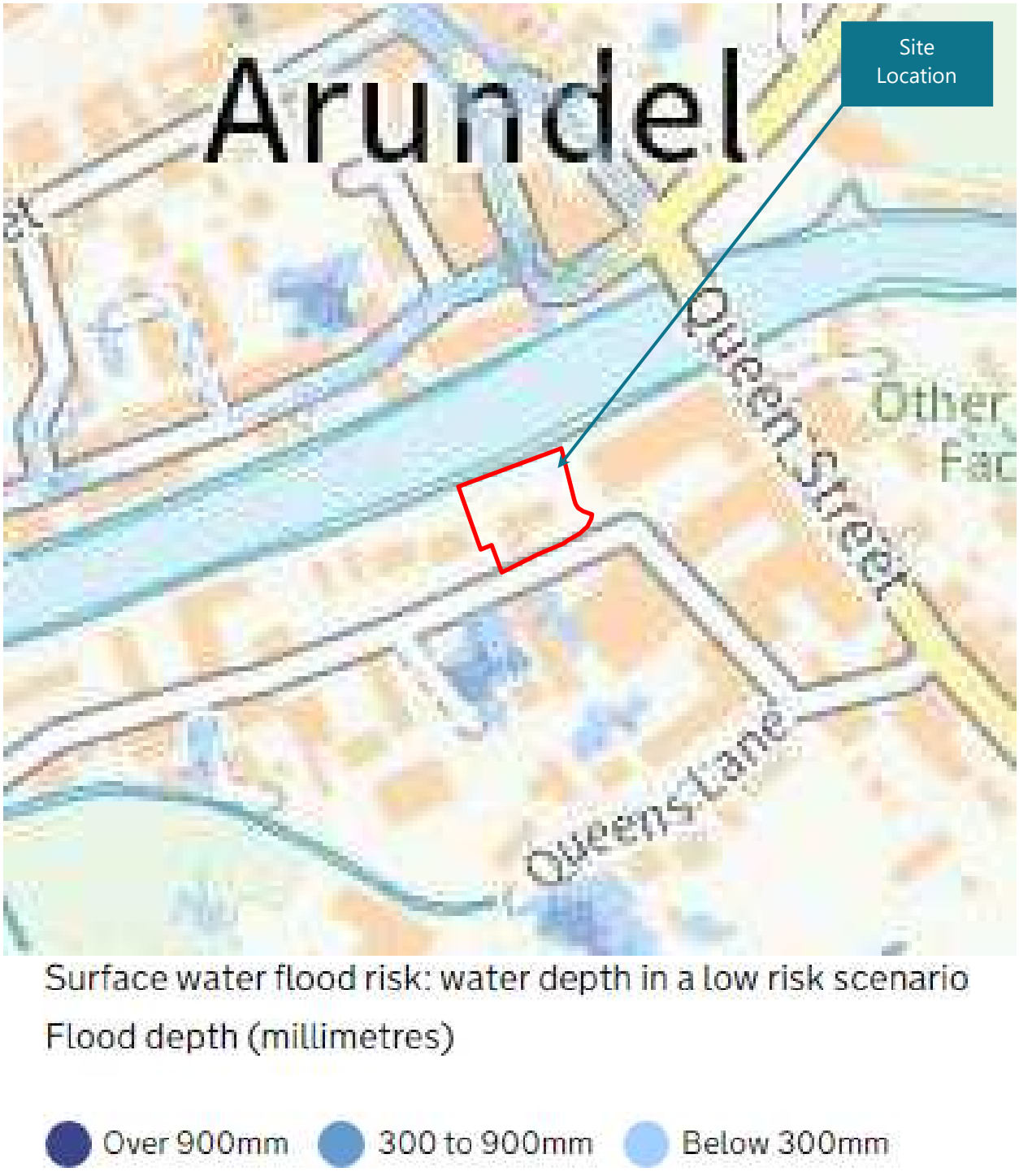
	NGR		Modelled Flood Depths in Metres Defended Annual Exceedance Probability		
Node Ref	**Eastings**	**Northings**	**0.5%**	**0.5% (2110)****	**0.1%**
1	501886	106950	-	2.10	-
2	501911	106962	-	2.20	-
3	501902	106948	-	2.20	-
4	501892	106929	-	1.29	-
5	501911	106939	-	0.32	-
6	501903	106926	-	1.29	-
7	501921	106930	-	0.53	-

All levels taken from: Lower Tidal River Arun Strategy Study, completed by Atkins in 2010.

*** Climate Change allowances for this model only show the superseded 20% increase in flows. The current allowances should be checked here: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.**

**** The flood risk data provided is based on existing EA hydraulic models with an allowance for climate change. Please note the climate change allowances provided are not up to date. These were updated on 27 July 2021.**
You should refer to 'Flood risk assessments: climate change allowances' for the most up to date allowances. You will need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

There is no additional information or health warnings for these levels/depths or the model from which they have been produced.

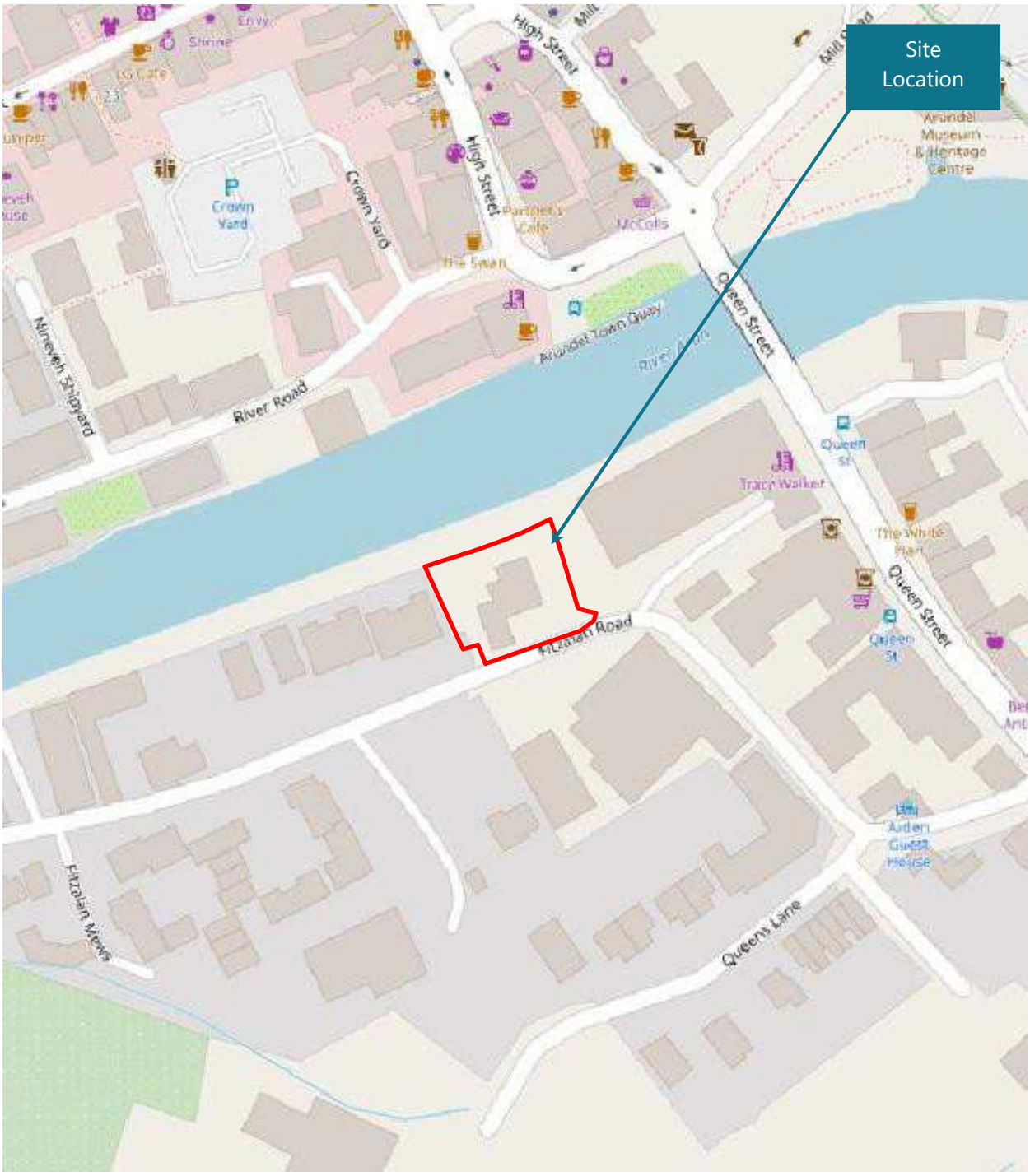


EA's Online Surface Water Flood Depth Map in a 'Low Risk Scenario'
(1 in 1000 years storm event)

The site is not liable to flood from this source

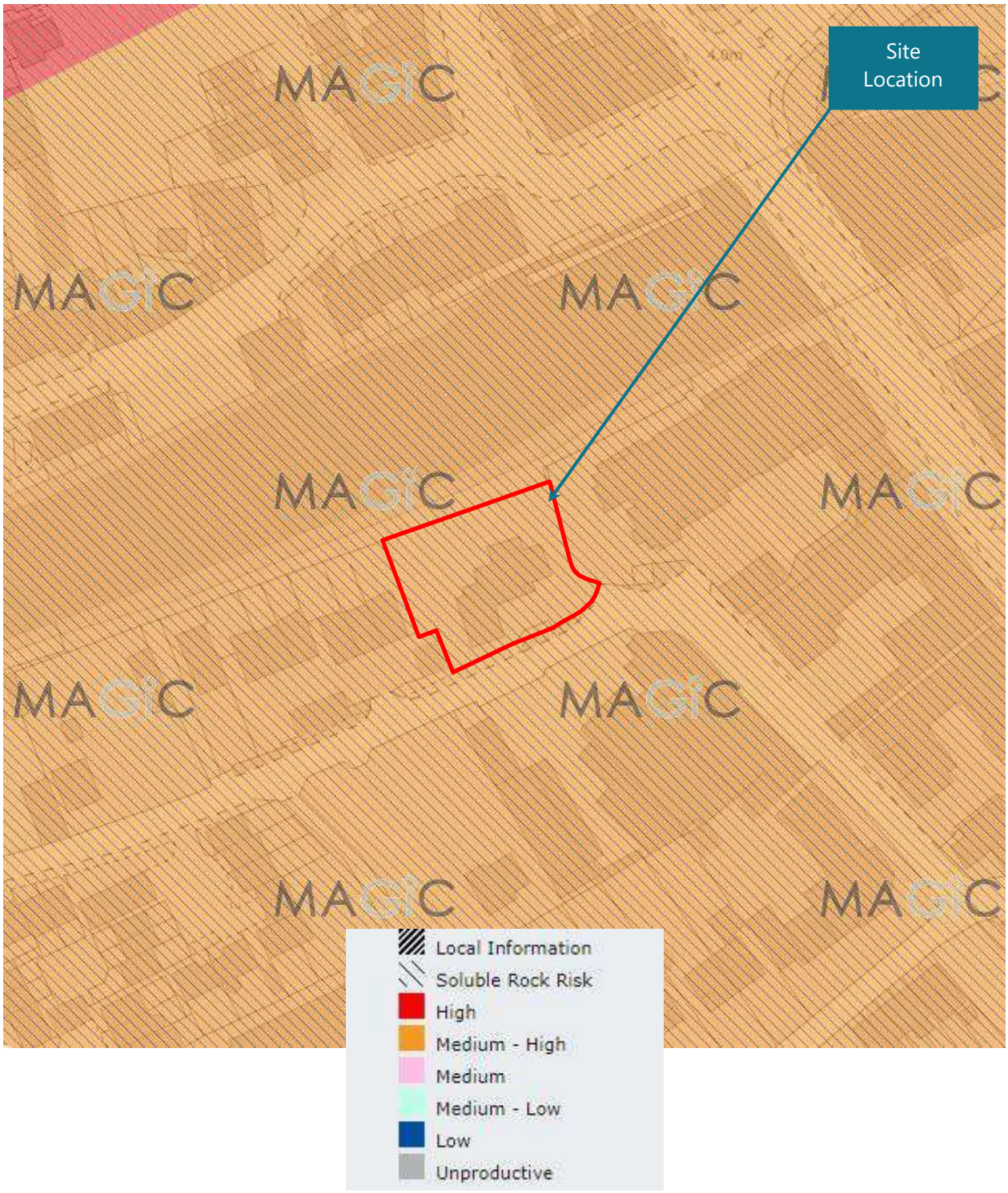
EA's Online Risk of Flooding from Reservoirs' Map

The site is liable to flood from this source 'when there is also flooding from rivers'



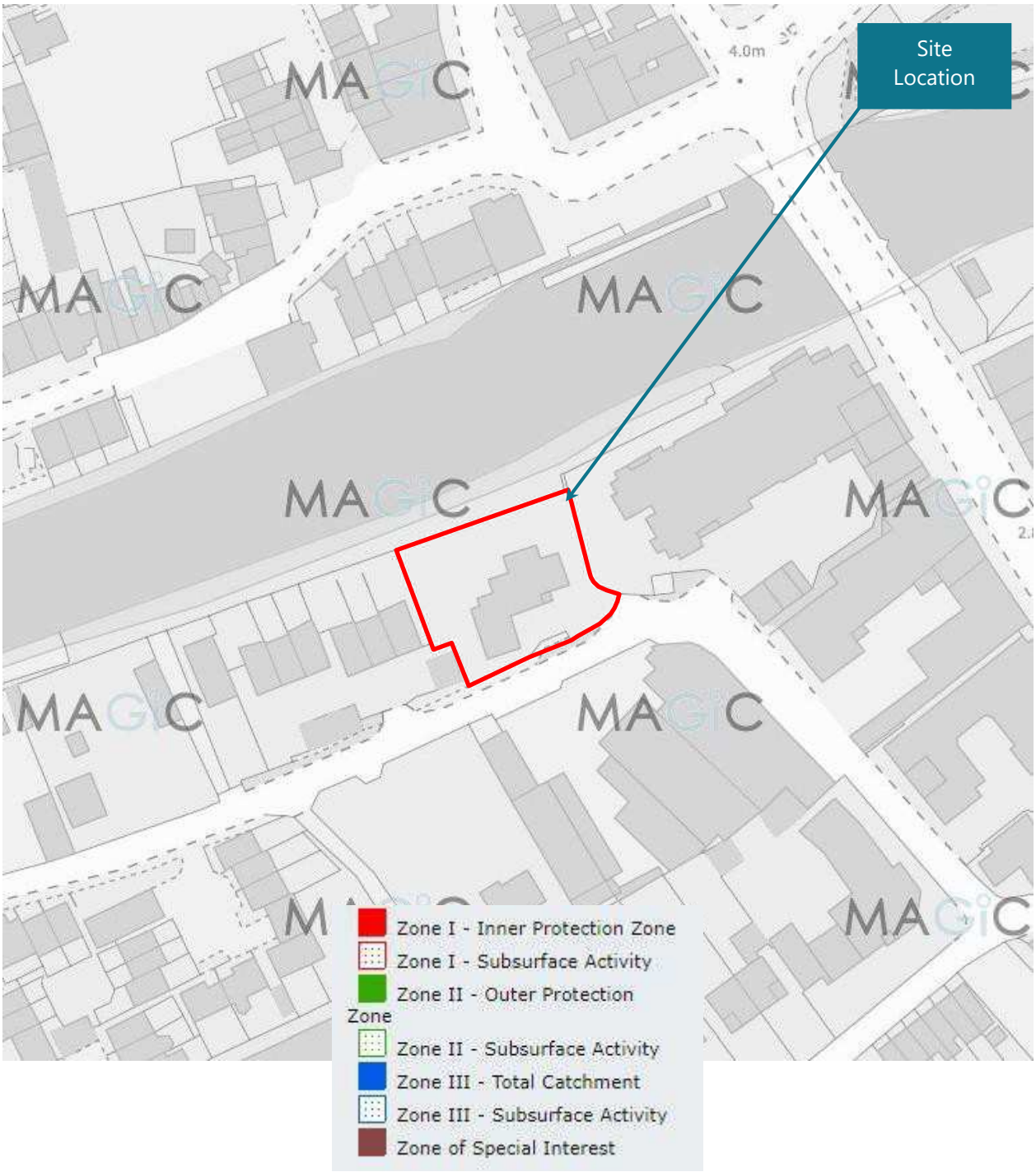
Environment Agency's Online Historic Flood Map

The site is removed from the nearest recorded Historic Flood



Environment Agency's Groundwater Vulnerability Zone Map

The site overlies a 'Medium - High' Aquifer

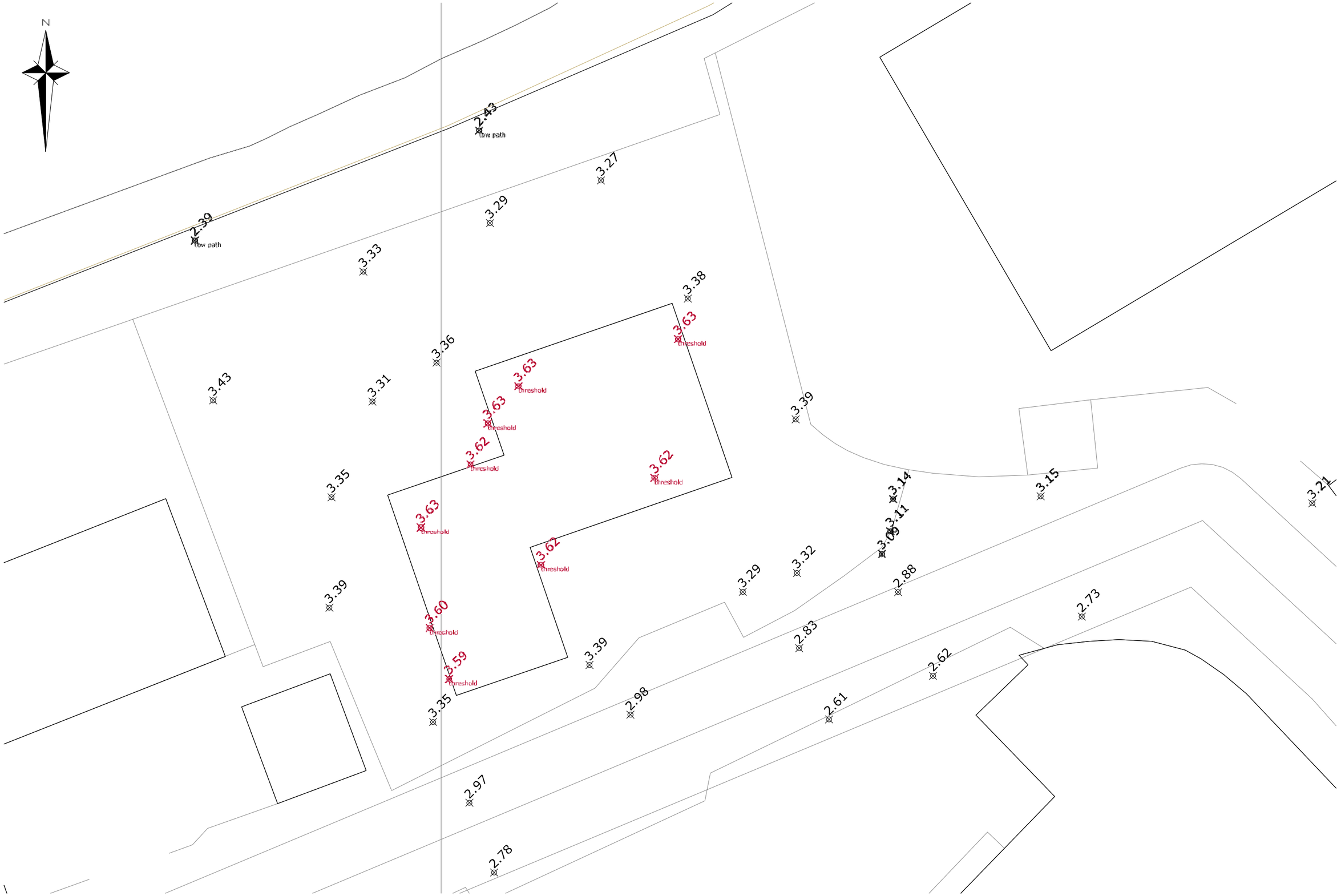


Environment Agency's Online Groundwater Source Protection Zones Map

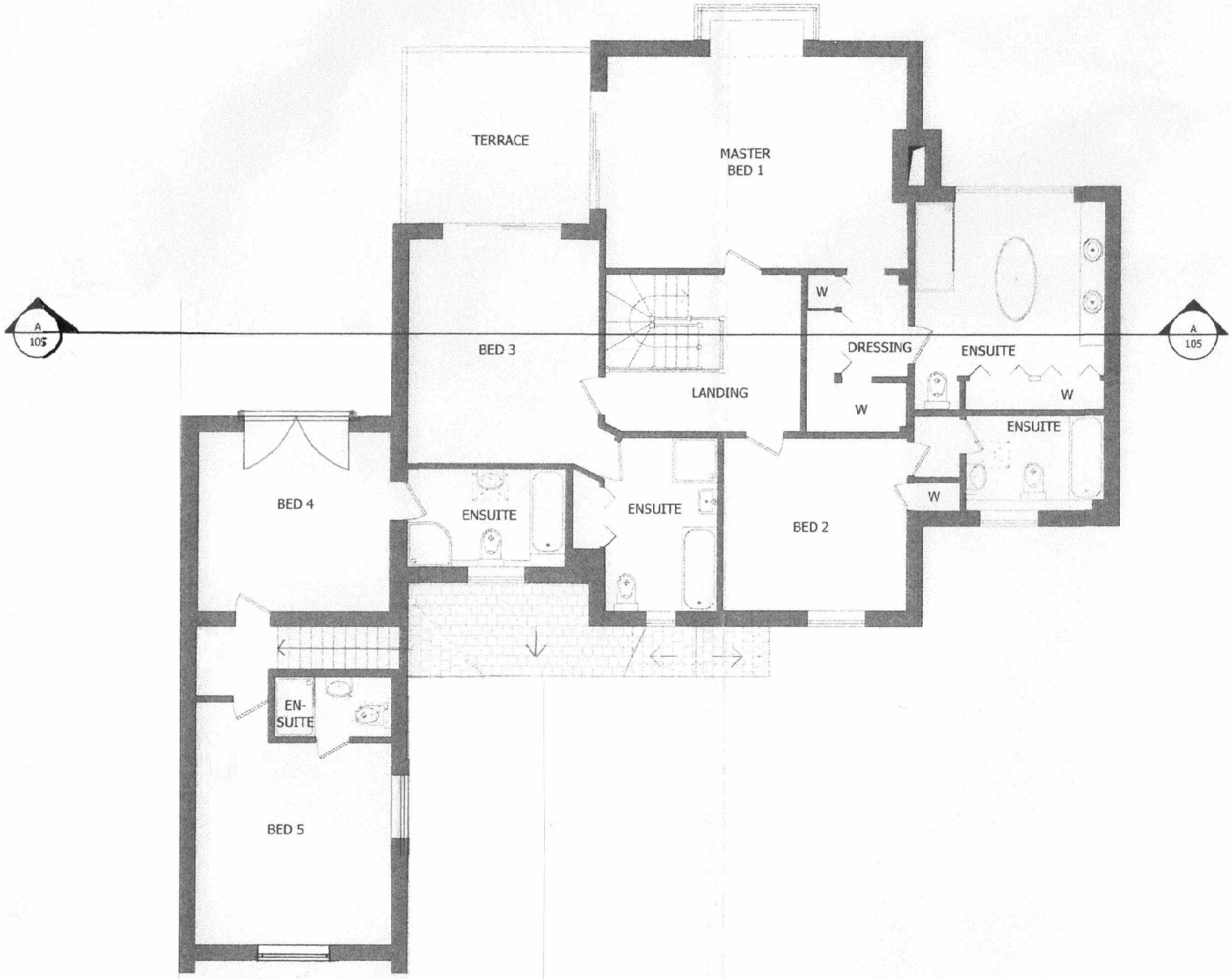
The site is removed from the nearest Groundwater Source Protection Zone

Appendix C

Topographic Survey & Architect's Scheme Drawings


N
2.43
flow path
2.39
flow path
3.27
3.29
3.33
3.38
3.63
threshold
3.36
3.63
threshold
3.43
3.31
3.63
threshold
3.62
threshold
3.62
threshold
3.35
3.63
threshold
3.62
threshold
3.39
3.60
threshold
3.59
threshold
3.39
3.35
3.39
3.14
3.11
3.15
3.21
3.29
3.32
2.88
2.73
2.83
2.98
2.61
2.62
2.97
2.78


T2
CV
Mud
9



PROPOSED FIRST FLOOR PLAN, Sc. 1:100