

NeoFlood Ltd

Mr and Mrs Shearwood

Proposed Extension of Old Mill, Knightmill

St Teath, Cornwall

Flood Risk Assessment

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1 Executive Summary

This Flood Risk Assessment has been prepared to accompany the planning submission seeking full planning permission for the **Proposed Extension of Old Mill, Knightmill at St Teath, Cornwall.**

The site has been assessed using the guidance noted in the Planning Practice Guidance: Flood Risk and Coastal Change documentation available on the Gov.uk website¹ and with regard to the Governments advice to Local Authorities².

The report concludes that the development site is located in Flood Zone 1 and the proposed development type is suitable for this location.

Furthermore, it is noted that the development site is not at risk of flooding from any other identified source and that as part of the development the deculverting of an existing watercourse could have a small but positive impact on flood risk locally.

¹ <http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/>

² <https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>

2 Introduction

The Government has placed increasing priority on the need to take full account of the risks associated with flooding at all stages of the planning and development process, to reduce future damage to property and loss of life. National Planning Policy Framework and associated Technical Guidance (NPPF-TG) identifies how the issue of flooding is dealt with in the drafting of planning policy and the consideration of planning applications.

The purpose of this report is to assist our client and the Local Planning Authority to make an informed decision on the flood risks associated with the proposed development of the site.

Local Planning Authorities have the powers to control development in accordance with the guidelines contained in NPPF-TG, and are expected to apply a risk-based approach to development with the Sequential Test. This sets out a sequential characterisation of flood risk in terms of annual probability of river, tidal and coastal flooding.

In accordance with the sequential test sites are to be classed as follows:

Flood Zone	Appropriate Uses
<p>Flood Zone 1 - Low Probability – This zone comprises land having less than 1 in 1000 annual probability of river or sea flooding (<0.1%)</p>	<p>All uses of land are appropriate in this zone.</p>
<p>Flood Zone 2 - Medium Probability – This zone comprises land assessed as having between 1 in 100 and 1 in 1000 annual probability of river flooding (1%-0.1%) or between 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5%-0.1%) in any year</p>	<p>The water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure in Annex 3 are appropriate in this Zone.</p> <p>Subject to the Sequential Test being applied, the highly vulnerable uses in Annex 3 are only appropriate in this zone if the Exception Test is passed</p>
<p>Flood Zone 3a - High Probability – 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</p>	<p>The water-compatible and less vulnerable uses of land in Annex 3 area appropriate in this zone.</p> <p>The highly vulnerable uses in Annex 3 should not be permitted in this zone.</p> <p>The more vulnerable and essential infrastructure uses in Annex 3 should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this should be designed and constructed to remain operational and safe for users in time of flood.</p>

<p>Flood Zone 3b - Functional Floodplain</p> <p>– This zone comprises land where water has to flow or be stored in times of flood. SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes)</p>	<p>Only the water-compatible uses and the essential infrastructure listed in Annex 3 that has to be there should be permitted in this zone. It should be designed and constructed to:</p> <ul style="list-style-type: none">• Remain operational and safe for users in times of flood;• Result in no net loss of floodplain storage;• Not impede water flows; and• Not increase flood risk elsewhere. <p>Essential infrastructure in this zone should pass the Exception Test.</p>
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This report is a **Flood Risk Assessment** for the **Proposed Extension of Old Mill, Knightmill at St Teath, Cornwall**,

The site is to be assessed with respect to the requirements of National Planning Policy Framework (NPPF) and the associated Technical Guide (NPPF-TG) to determine the suitability of the proposed type of development for this site.

As well as fluvial flood risk the report will also assess the risk posed locally by the development itself and the runoff it may potentially generate.

Finally, if required, mitigation measures and recommendations will be made that will enable the site to be suitably developed while actively seeking to reduce flood risk locally.

The following guidelines and references have been used in the preparation of this report:

- a) Planning Practice Guidance – Flood Risk and Coastal Change
- b) DEFRA / EA – Flood Risk Assessments: Local Planning Authorities

The report is also based on additional information received from the Environment Agency (EA) and Cornwall Council (CC)

This report has been produced on behalf and for the sole use of **Mr and Mrs Shearwood** for the purposes of the application described herein with the permission of the author. If any unauthorised Third Party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill.

The findings and opinions conveyed within this report are based on information obtained from a variety of sources, as detailed, which the Author believes are reliable. Nevertheless, the Author cannot and does not guarantee the authenticity or reliability of the information it has relied upon from these sources.

The report will follow accepted procedure in providing the services but given the residual risk associated with any prediction and the variability which can be experienced in flood conditions, the Author takes no liability for and gives no warranty against actual flooding of any property (client's or third party) or the consequences of flooding in relation to the performance of the services. Similarly, our preparation of this report does not guarantee that a Planning Consent will be granted.

Allowance for the effects of climate change will be made in accordance with government recommendations in place and statistical data available at the time of writing this report. These recommendations may become more onerous and the statistical data may be revised in future; we will not make any estimate of what changes may result from this. Please be aware that this, and other issues over which the consultant has no control, may affect future flood risk at your development and require you to undertake further work for which we accept no liability.

3 Existing Site

3.1 Site Location

The existing property known as the Old Mill is located in the settlement of Knightmill approximately half a mile east of the settlement of St Teath, Cornwall.

The existing property is accessed via a private drive connecting to the B3267 close to the junction with the A39.

A site location plan illustrating the same is included in Appendix A.

3.2 Site Description

The development site comprises three existing buildings within the property curtilage. These are known as The Old Mill, The Stables and The Bungalow.

The buildings are centred on a central courtyard area connected to the private driveway.

A topographical survey has been undertaken for the site and is included in Appendix B for reference.

The survey indicates that in general the overall site area slopes from northwest to southeast with the eastern boundary being lower than the west.

The highest recorded level is in the northeast at around 85.0mAOD and the lowest at the site entrance at 81.0mAOD. The central area around the buildings is relatively level with recorded levels of between 82.0mAOD in the north and 81.2mAOD in the southeast.

There is a retaining wall to higher land beyond the western boundary of the site (the carriageway of the B3267) and an elevated garden area and channelled leet (manmade watercourse) also at the higher level. The leet flows from higher land to the north of the site via two sluice gates along the western boundary of the site and to the south of the Old Mill existing the site via a culvert on the southern boundary.

From this leet is a secondary channel that splits flow from the leet via another sluice gate, flow in this channel discharges via a waterfall feature to an open channel that flows to the north of the Old Mill building before discharging via a culvert past the building and under the courtyard area.

The culvert then discharges back to open channel in to a Japanese water garden to the east of the Bungalow and private drive.

The leet and the sluices are the remnants of the manmade watercourses used to power the historic mill in this location.

3.3 Existing Site Drainage

As noted in the site description, there are two manmade watercourses crossing the site.

Surface water from the existing development is discharged to these watercourses locally or it runs off across the private drive to the Japanese water garden to the east.

Foul drainage for the site is collected and discharged to a septic tank which then discharges via a drainage field remote from the site.

3.4 Existing Watercourses

The River Allen flows from north to south approximately 60m east of the site. It is locally culverted under the A39.

The watercourse that feeds the Old Mill discharges to the River Allen through the Japanese water garden.

3.5 Existing Land Drains / Ditches

The water supply to the Old Mill is taken from a mill race to the north, this is fed from a side weir from the channel of the River Allen. This can be isolated as and when required.

3.6 Adopted Drainage

The area is remote from adopted foul and surface water drainage.

Locally surface water is discharged directly to the River Allen with foul drainage either treated via package plants or septic tanks.

3.7 Highway Drainage

Observations indicate that the carriageway of the B3267 is not formally drained for the most part upstream of the Old Mill site. Similarly to many rural roads, drainage is over-the-edge or along the channel of the metalled part of the road. There is no footway for the most part.

There are three road gullies located across the entranceway from the B3267 to the private drive of the Old Mill.

4 Development Proposals

4.1 Link Building and Extension

It is proposed that a two-storey extension is built on the eastern elevation of the Stables building and a single-storey connecting building created between the extension and the Old Mill, effectively joining the two properties so they will be occupied as a single dwelling.

The footprint of the extension and the link building is 90m².

As part of the development, it is also proposed that one of the culvert sections of the manmade watercourse is opened up and made a feature of the new extension building.

4.2 Vulnerability Classification

As the development is for habitation it is classified as 'More Vulnerable' in accordance with Table 3³ of the NPPF. This retains the existing classification of the site with no change in vulnerability.

4.3 Design Life

The development is anticipated to have design life of 50 to 100-years.

³ <https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification>

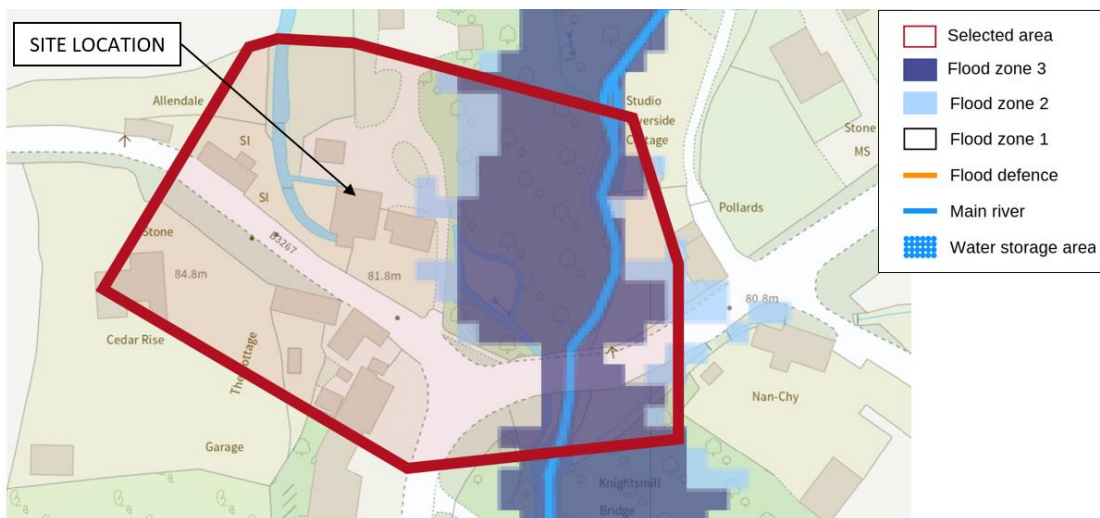
5 Sequential Test

5.1 Fluvial Flood Zone Classification

A request for EA flood data was made in June 2023. The response from the EA is referenced CAJ5XY3RUTBC and the main outputs included in Appendix D

An extract is included in Figure 1 below.

Figure 1 - EA Fluvial Flood Risk Map



Source – [EA RFI reference CAJ5XY3RUTBC](#)

The mapping indicates that the development site is located in Flood Zone 1 but that the land east of the private driveway is located in Flood Zone 3.

5.2 Sequential Test

As the site is located in Flood Zone 1 no sequential test is required.

6 Climate Change

6.1 Application to site

The NPPF requires that the future impacts of climate change are included the design of any development. This applies to predicted changes to flows in rivers and also in catchment specific rainfall events.

These factors should be applied when considering flows in channels and the design of surface water management systems.⁴

6.2 Climate change factors

Data on the catchment specific climate change factors is provided by the Environment Agency.

The site is identified to be in the North Cornwall, Seaton, Looe and Fowey Management Catchment.

The development is assumed to have a design life of 50-75 years.

6.2.1 Fluvial factors

These are split in to three epochs; 2020s, 2050s, and 2080s.

River flows are then split in to three climate change scenarios; Central, Higher and Upper.

The selection of the epoch is related to design life of the development with the climate change scenario determined by the development type and the flood zone classification.

Epoch	Central	Higher	Upper
2020s	11%	16%	26%
2050s	18%	25%	43%
2080s	36%	48%	74%

Source i - <https://environment.data.gov.uk/hydrology/climate-cange-allowances/river-flow?mgmtcatid=3061>

⁴ <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#table-1>

6.2.2 Rainfall factors

These are split in to two epochs related to the design life of the development noted as 2050s and 2070 epochs.

It is also split into two separate climate change prediction scenarios the Central and Upper End estimates of future climate change.

Epoch	Central allowance	Upper end allowance
2050s	25%	45%
2070	30%	50%

Source ii - <https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall?mgmtcatid=3061>

7 Sources and Extent of Existing Flooding

7.1 Introduction

The site is assessed to have the following flood risk associated with both natural and artificial sources identified in the table, the description of each flood risk source and the potential impact on the site is given in the sections below.

7.2 Flood Risk from Natural Sources

Source	Assessed Residual Risk				Comment
	High	Medium	Low	N/a	
Watercourses			x		Noted to be in FZ3 but on the periphery using JFLOW modelling
Pluvial			x		Low risk identified on mapping
Overland			x		General local topography, secondary conveyance in adjacent carriageway
Groundwater			x		No visual evidence
Climate Change			x		Assessed and evaluated see section 6

7.2.1 Watercourses

7.2.1.1 Potential Source and Extent

The EA's on-line flood mapping has been obtained from the Environment Agency (EA) and flood zone maps are included in Figure 2 below.

The EA guidance notes the following:

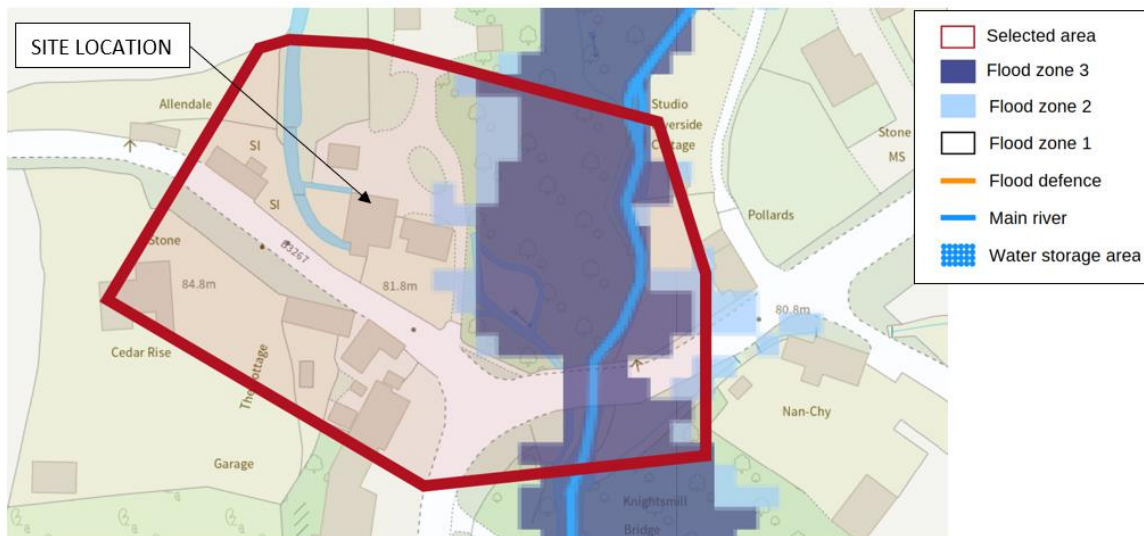
High risk - means that each year this area has a chance of flooding of greater than 3.3%. This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

Medium risk - means that each year this area has a chance of flooding of between 1% and 3.3%. This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

Low risk - means that each year this area has a chance of flooding of between 0.1% and 1%. This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

Very low risk - means that each year this area has a chance of flooding of less than 0.1%. This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

Figure 2 - EA Fluvial Flood Risk Map



Source – [EA on-line flood mapping](#)

7.2.1.1 Flood Risk to Site

The mapping shows that the development part of the site is located in Flood Zone 1, an area of very-low flood risk potential.

The Japanese garden to the east of the private access road is noted to be in Flood Zone 3.

The JFLOW mapping provided by the EA also includes modelled water levels at various nodes in the channel. It is noted that JFLOW modelling is low resolution catchment scale modelled and is not generally accurate enough for individual property level assessments, however in this case there is no alternative data available.

Node 937 is the closest in proximity to the development site and is located around 20m upstream of the culvert under the A39 (see mapping in Appendix D).

The JFLOW model gives the following levels:

Modelled JFLOW Flood levels



This data is taken from the JFLOW model. Please refer to the attached caveat when considering JFLOW modelled levels.

Jflow Study: Jflow_2007

Node Reference	Easting	Northing	Modelled Flood levels, in mAOD	
			1% AEP (1 in 100 year)	0.1% AEP (1 in 1000 year)
935	207197	80333	77.64	77.74
936	207162	80527	79.78	79.94
937	207148	80654	80.94	81.15
938	207166	80715	81.45	81.58
939	207172	80897	83.17	83.38

Correct as of 08 / 06 / 2023

For reference the development site is located at minimum level of 81.40mAOD, this is 250mm above the 1 in 1000-year flood level and 460mm above the 1 in 100-year level.

7.2.2 Pluvial Flooding

7.2.2.1 Potential Source and Extent

The EA provide indicative flood mapping for pluvial events, these assessments are based on failure of local drainage systems and are used to estimate where pluvial runoff that cannot enter an existing drainage system may flow towards.

The maps are not detailed hydraulic assessments, but they do identify lower areas of topography where overland flow may accumulate.

Therefore, while these do not provide a flood risk assessment in themselves, they are a useful tool in highlighting locations for further investigation.

Extracts from this mapping are included below for reference.

High risk - means that each year this area has a chance of flooding of greater than 3.3%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

Medium risk - means that each year this area has a chance of flooding of between 1% and 3.3%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

Low risk - means that each year this area has a chance of flooding of between 0.1% and 1%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

Very low risk - means that each year this area has a chance of flooding of less than 0.1%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

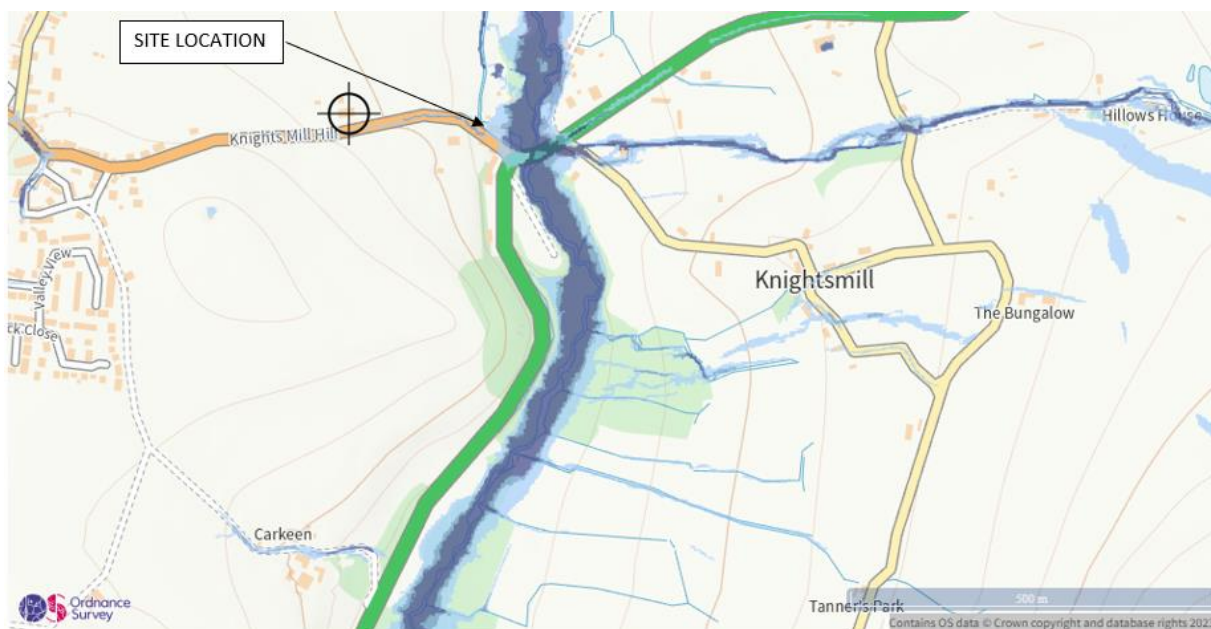
7.2.2.1 Flood Risk to Site

The mapping shows that the development is at low-risk from pluvial flooding – that is between 0.1% and 1% AEP.

The site is adjacent to an area of high-risk flooding which corresponds to the lower lying areas of the site noted in the topographical survey (see Appendix B).

As noted previously the development site is located at a higher level than the adjacent gardens and so has significant passive protection from larger overland and pluvial flows.

Figure 3 - Extract from EA Surface Water Flood Mapping

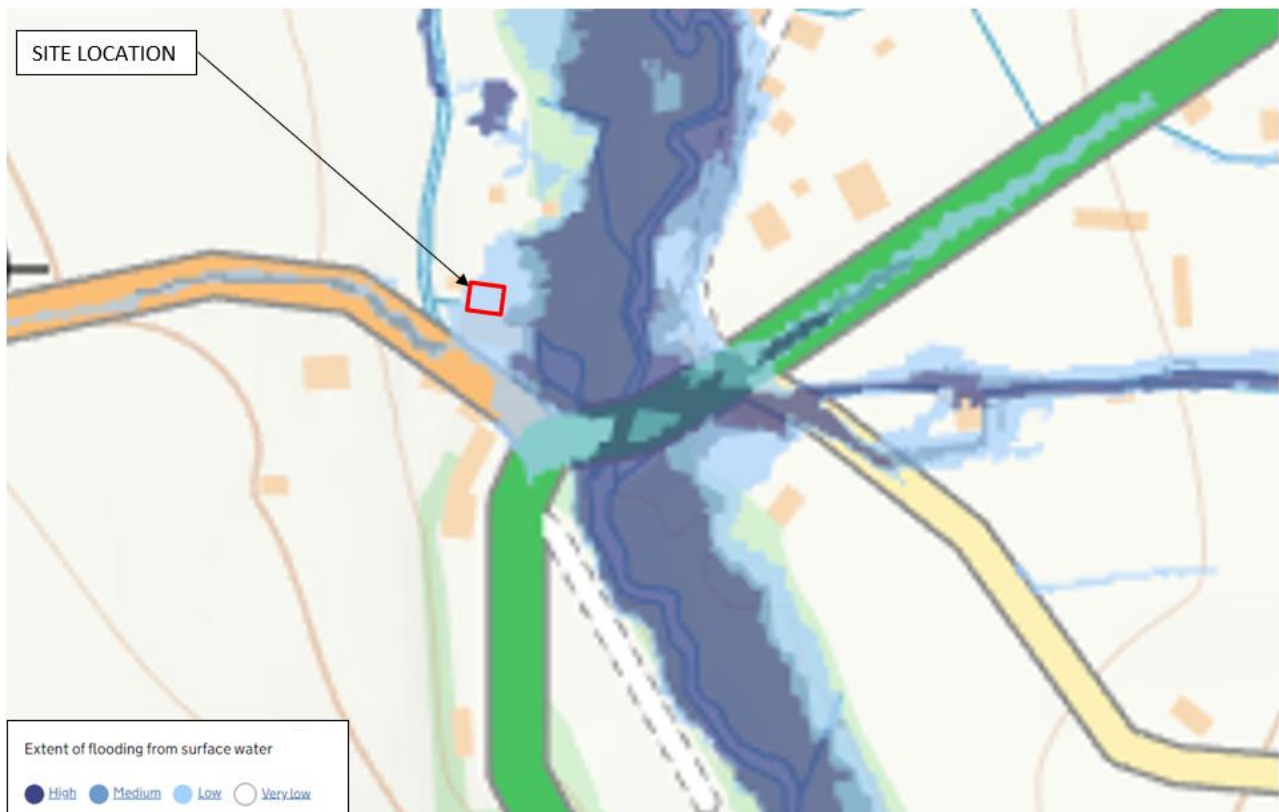


Extent of flooding from surface water

● High ● Medium ● Low ○ Very Low ⊕ Location you selected

Source – [EA on-line flood mapping](#)

Figure 4 - Extract form EA Pluvial mapping



Source – [EA on-line flood mapping](#)

7.2.3 Overland flow

7.2.3.1 Potential Source and Extent

The pluvial maps included above account for local topography in determining areas of ponding, as such they will also identify overland flow routes.

The mapping shows the principal routes follow the valley of the River Allan and as such the overland flow risk is very similar to the pluvial risk.

Higher land to the north and west of the site has a small residual potential to generate runoff but these flows would be intercepted by the leet to the north of the site and be channelled safely through the site to the river.

7.2.3.2 Flood Risk to Site

Given the site topography, the additional conveyance available in the leet, and with reference to the EA mapping, the site is noted to be at low-risk of flooding from this source.

7.2.4 Groundwater

7.2.4.1 Potential Source and Extent

There are no reported issues with groundwater flooding on the existing adjacent site. The lower area of the Japanese garden is not inundated and requires a feed from the leet to maintain water levels.

7.2.4.2 Flood Risk to Site

There is no evidence of elevated water levels locally and the nearby watercourse would serve as a relief and flow path for groundwater should it occur near the surface of the lower parts of the site to the east of the private driveway.

7.3 Artificial Sources

Source	Assessed Residual Risk				Comment
	High	Medium	Low	N/a	
Adopted Drainage			x		Limited local adopted assets
Existing Drainage			x		No change to drainage systems – deculverting is an option
Highway Drainage		x			Potential runoff at site entrance
Reservoirs				x	Very low residual risk
Development Proposals				x	No change in runoff profile

7.3.1 Adopted Drainage

7.3.1.1 Potential Source and Extent

The settlement of Kingsmill is not connected to the adopted drainage network. Surface water is discharged locally to the River Allen and foul drainage is managed using package treatment and septic tanks.

7.3.1.2 Flood Risk to Site

As the site is not directly impacted by any adopted assets it is not considered to be at risk from this source.

7.3.2 Existing Drainage

7.3.2.1 Potential Source and Extent

The existing buildings have roof water collection systems that discharge locally to the leet crossing the site with parts of the hardstanding also drained to the feature. The rest of the site runs off to the Japanese Garden to the east.

The capacity of the leet is several magnitudes larger than the maximum flow rates that could be generated by the existing site.

7.3.2.2 Flood Risk to Site

The new development will be located on an area of existing drained hardstanding and so there will be no change in runoff profile or flood risk as a result of the development.

7.3.3 Highway Drainage

7.3.3.1 Potential Source and Extent

As noted previously, the carriageway of the B3267 runs along the south-western boundary of the site and it is observed to have limited positive drainage along the 600m of hard paved area that extends uphill towards St Teath.

The carriageway has the potential to generate a significant volume of runoff in an extreme event and while most of the flow would likely spill over the edge to undeveloped areas along the road alignment there is a reasonable possibility that sizeable flows would reach the boundary of the property and the access junction in particular.

The carriageway is approximately 6m wide and at over 600m in length this could generate flows of up to 50l/s for a 50mm/hr event. This is an existing flood risk that will not be modified as part of the development of the site.

7.3.3.2 Flood Risk to Site

The development site is not directly at risk from this source, however there is pedestrian access directly on to the carriageway to the south of the Old Mill that could allow some flow from the road on to the site and a little downstream of this the topographical survey shows that the private access drive is around 400mm lower than the channel line of the road which would create an exceedance path on to the access driveway.

It is noted that from this point the flow route would be on to the driveway and then off to the lower land to the east, away from the habitable buildings.

Given the passive protection afforded by the topography of the site there is no flood risk to the development but a small risk of nuisance flooding across the driveway in extreme events. As noted previously, this is an existing flood risk and will not be affected or be exacerbated by the proposed property extension.

7.3.4 Reservoirs

7.3.4.1 Potential Source and Extent

EA flood mapping shows the site is outwith the modelled boundary of reservoir failures in this area.

7.3.4.2 Flood Risk to Site

Flooding from reservoirs is considered to be extremely unlikely. Regular and proactive inspection under the Reservoirs Act ensures these assets are maintained to a high-level.

Notwithstanding this, the development site is not considered to be at risk from this source.

7.3.5 Development Proposals

7.3.5.1 Potential Source and Extent

The proposed development will not increase the impermeable area of the site as it is like-for-like replacement of impermeable area.

Part of the development does potentially include the opening up of the 250mm diameter culvert to the north of the Old Mill building to create a feature channel over which a transparent section of flooring may be installed.

This would not only provide an interesting aesthetic to the building but would also significantly increase the conveyance capacity of this section of the drainage system and reduce the risk of blockage locally.

For reference the development plans are included in Appendix D.

7.3.5.2 Flood Risk to Site

The development of the site will not change the flood risk from this source which has already been demonstrated to be very low.

The deculverting exercise, while not required to manage flood risk would have a positive impact of flood and blockage risk locally.

8 Flood Risk Mitigation

8.1 Site Levels

The general site is protected from flood events by the natural topography and the site is classified as Flood Zone 1. However, as part of the development of the site general principles of sloping hard paving away from buildings and planning exceedance routing should be considered.

8.2 Access and Egress

As the site is located in Flood Zone 1 no specific access and egress route needs to be identified. However, the site has a main vehicle access route to the south which is located adjacent to an area classified as Flood Zone 3.

In this case it is noted that there is a secondary pedestrian access to the B3267 to the south which is located in Flood Zone 1. As noted previously, this is an existing flood risk and will not be affected or be exacerbated by the proposed property extension.

8.3 Flood Resistance and Resilience

The site is not considered to be at risk of flooding from any source. Notwithstanding this, there are some flood resilience measures that can be included in the construction of the extension that have zero cost but will provide additional resilience.

This would include measures such as using first floor down electrical circuits, solid state cavity wall insulation with sealed cavity returns, solid ground floors and raised utility entry points.

8.4 Drainage System Maintenance

While the site is not considered to be at risk from pluvial sources this is contingent in part on the continued operation of the existing positive drainage systems on the site.

It is therefore recommended that the awareness and knowledge of the existing systems is acquired during the construction works and that pro-active maintenance is implemented on the site.

Furthermore, the residual risk of inundation of the site entrance can be mitigated in part by active vigilance of the condition and capacity of the adopted highway drainage assets located at the site entrance. Regular reminders to the local highway authority to clean and maintain these gullies will ensure that when there is an extreme event they can convey as much water as possible and stop or reduce the nuisance flooding that could impact the site entrance.

9 Conclusions

Following this assessment, it is determined that the proposed More Vulnerable development of the site is suitable for this location.

The site is classified as being in Flood Zone 1 an area with very-low risk of fluvial flooding. The site is shown to be over 250mm higher than the modelled 1 in 1000-year flood level.

The site is assessed to be unaffected by all other source of flood risk potential with only a small residual risk associated with carriageway runoff affecting the private drive entrance.

The development of the site will not change the runoff profile of the site and the potential to open up part of the culverted section of the watercourse of the site would locally reduce flood and blockage risk and thus have a small but positive impact.

Notwithstanding the above, consideration should be given to the inclusion of basic flood resilience measures in the construction of the extension. Some viable options are listed in section 8.3 with more information available in the Government publication 'Improving the Flood Performance of New Buildings'⁵.

5

https://assets.publishing.service.gov.uk/media/602d673ee90e0709e8d085d8/Improving_the_Flood_Resilience_of_Buildings_Through_Improved_Materials_Methods_and_Details_Technical_Report.pdf

Appendix A – Site Location Plan

Site Location Plan

Knights Mill, St Teath



Appendix B – Site Topographical Survey

B1 – SUMO Services - SUMO-10875

Appendix C – Proposed Development Layout

- C1 – Swain Architecture 22.425 S02.01 – Proposed Ground Floor Plan
- C2 – Swain Architecture 22.425 S02.02 – Proposed First Floor Plan
- C3 – Swain Architecture 22.425 S02.03 – Proposed Elevations

Notes:
 Copyright retained in accordance with the copyright design and patents act 1988. Dimensions must not be scaled from this drawing. The contractor is to check and verify all building and site dimensions before work is commenced. The Contractor is to check and verify with all Statutory Authorities and Employer the local and condition of any underground or overhead services or confirm that none exist prior to work commencing on site.

CDM Regulations 2015:

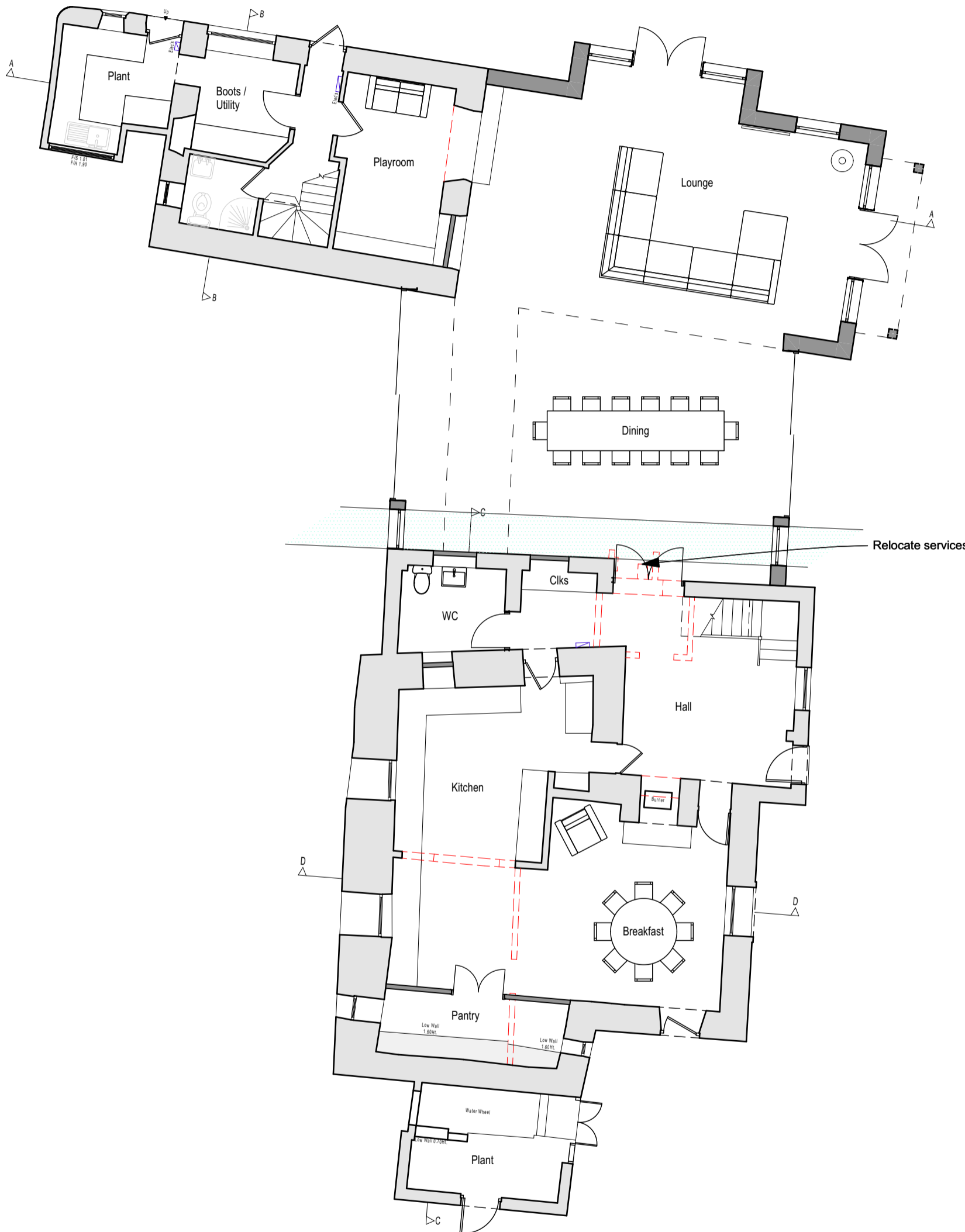


Denotes a significant hazard or difficult to manage procedure. Please refer to 'Designer Risk Assessment' for further information regarding mitigation of hazards.

CDM Regulations, require all projects to:

- Have workers with the correct skills, knowledge, training and experience.
- Contractors providing appropriate supervision, instruction and information.
- A written Construction Phase Plan.

Swain Architecture are appointed as 'Designer' only, unless appointed by the client in writing to confirm Swain Architecture's role as 'Principal Designer'.



Concept

Client: Mr and Mrs Shearwood
 Project: The Old Mill, Knightsmill
 Drawing: Proposed GF Plan
 Number: 22.425 S02.01

Date: Jan 2023

Paper Size: A3

Scale: 1/100

Drawn By: EAR

Checked By:



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 E: info@swainarchitecture.com
 T: 0115 972 7685
 Mohan Business Centre, Tamworth
 Road, Long Eaton, Nottingham,
 NG10 1BE.

Rev	Description	Date

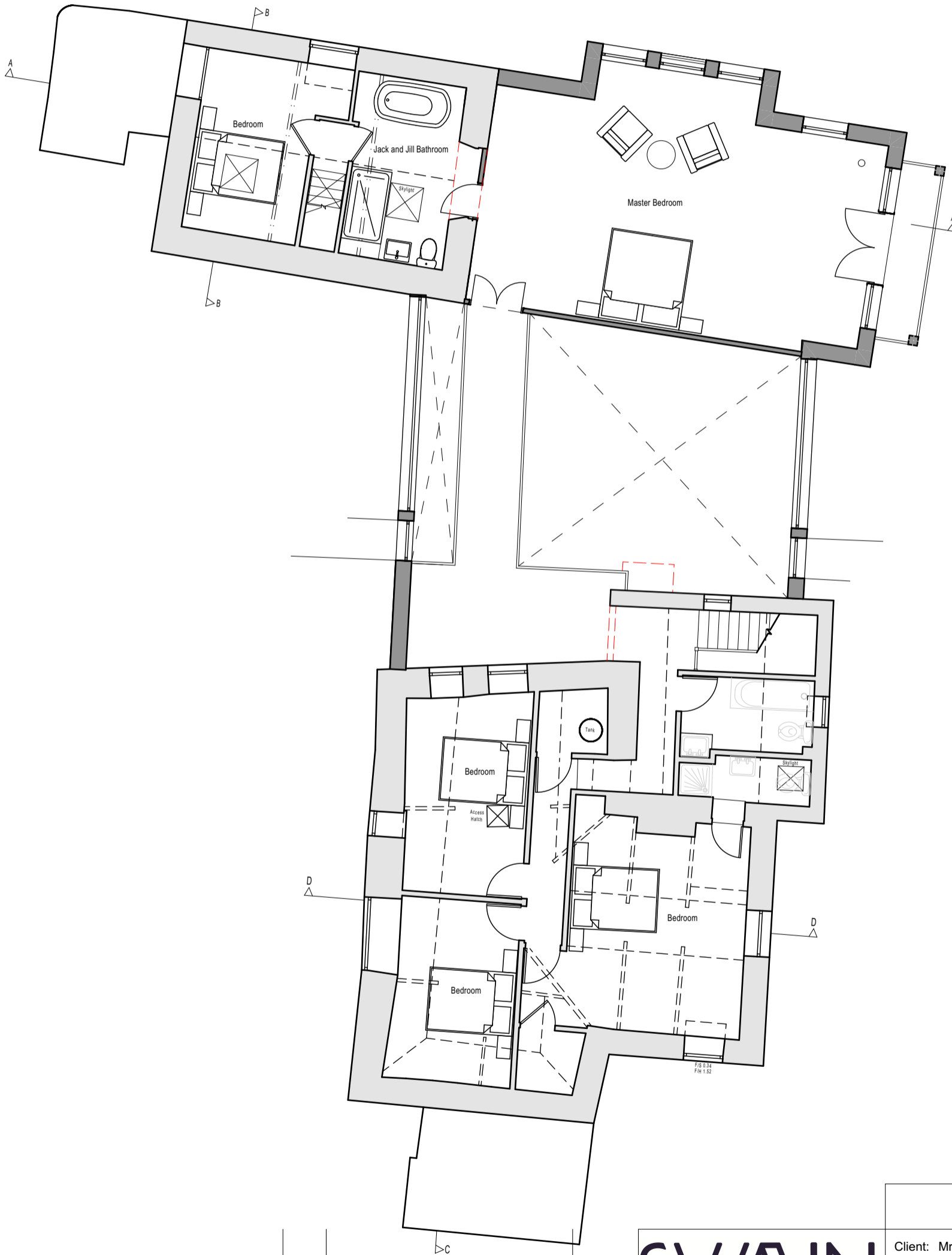
Notes:
 Copyright retained in accordance with the copyright design and patents act 1988. Dimensions must not be scaled from this drawing. The contractor is to check and verify all building and site dimensions before work is commenced. The Contractor is to check and verify with all Statutory Authorities and Employer the local and condition of any underground or overhead services or confirm that none exist prior to work commencing on site.

CDM Regulations 2015:



Denotes a significant hazard or difficult to manage procedure. Please refer to 'Designer Risk Assessment' for further information regarding mitigation of hazards.

CDM Regulations, require all projects to:
 - Have workers with the correct skills, knowledge, training and experience.
 - Contractors providing appropriate supervision, instruction and information.
 - A written Construction Phase Plan.
 Swain Architecture are appointed as 'Designer' only, unless appointed by the client in writing to confirm Swain Architecture's role as 'Principal Designer'.



Concept



Client: Mr and Mrs Shearwood
 Project: The Old Mill, Knightsmill
 Drawing: Proposed FF Plan
 Number: 22.425 S02.02

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 Mohan Business Centre, Tamworth
 Road, Long Eaton, Nottingham,
 NG10 1BE.

Date: Jan 2023
 Paper Size: A3 Scale: 1/100
 Drawn By: EAR Checked By:

Rev	Description	Date

Notes:
 Copyright retained in accordance with the copyright design and patents act 1988. Dimensions must not be scaled from this drawing. The contractor is to check and verify all building and site dimensions before work is commenced. The Contractor is to check and verify with all Statutory Authorities and Employer the local and condition of any underground or overhead services or confirm that none exist prior to work commencing on site.

CDM Regulations 2015:
 ⚠ Denotes a significant hazard or difficult to manage procedure. Please refer to 'Designer Risk Assessment' for further information regarding mitigation of hazards.

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 - A written Construction Phase Plan.
 Swain Architecture are appointed as 'Designer' only, unless appointed by the client in writing to confirm Swain Architecture's role as 'Principal Designer'.

Alternative Master Layout



Proposed Front Elevation



Proposed Side / Garden Elevation

Concept

Client: Mr and Mrs Shearwood	
Project: The Old Mill, Knightmill	
Drawing: Elevations	
Number: 22.425 S02.03	
Date: Jan 2023	
Paper Size: A3	Scale: 1/100
Drawn By: EAR	Checked By:

SWAIN
 ARCHITECTURE

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 NG10 1BE.

Rev	Description	Date

Appendix D – Environment Agency Correspondence

D1 – EA RFI reference CAJ5XY3RUTBC

Flood risk assessment data

Location of site: 207100 / 80631 (shown as easting and northing coordinates)

Document created on: 8 June 2023

This information was previously known as a product 4.

Customer reference number: CAJ5XY3RUTBC

Map showing the location that flood risk assessment data has been requested for.



Flood map for planning (rivers and the sea)

Your selected location is in flood zone 3.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change

This data is updated on a quarterly basis as better data becomes available.







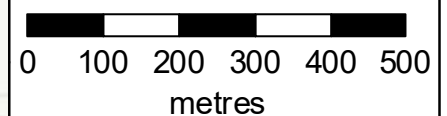
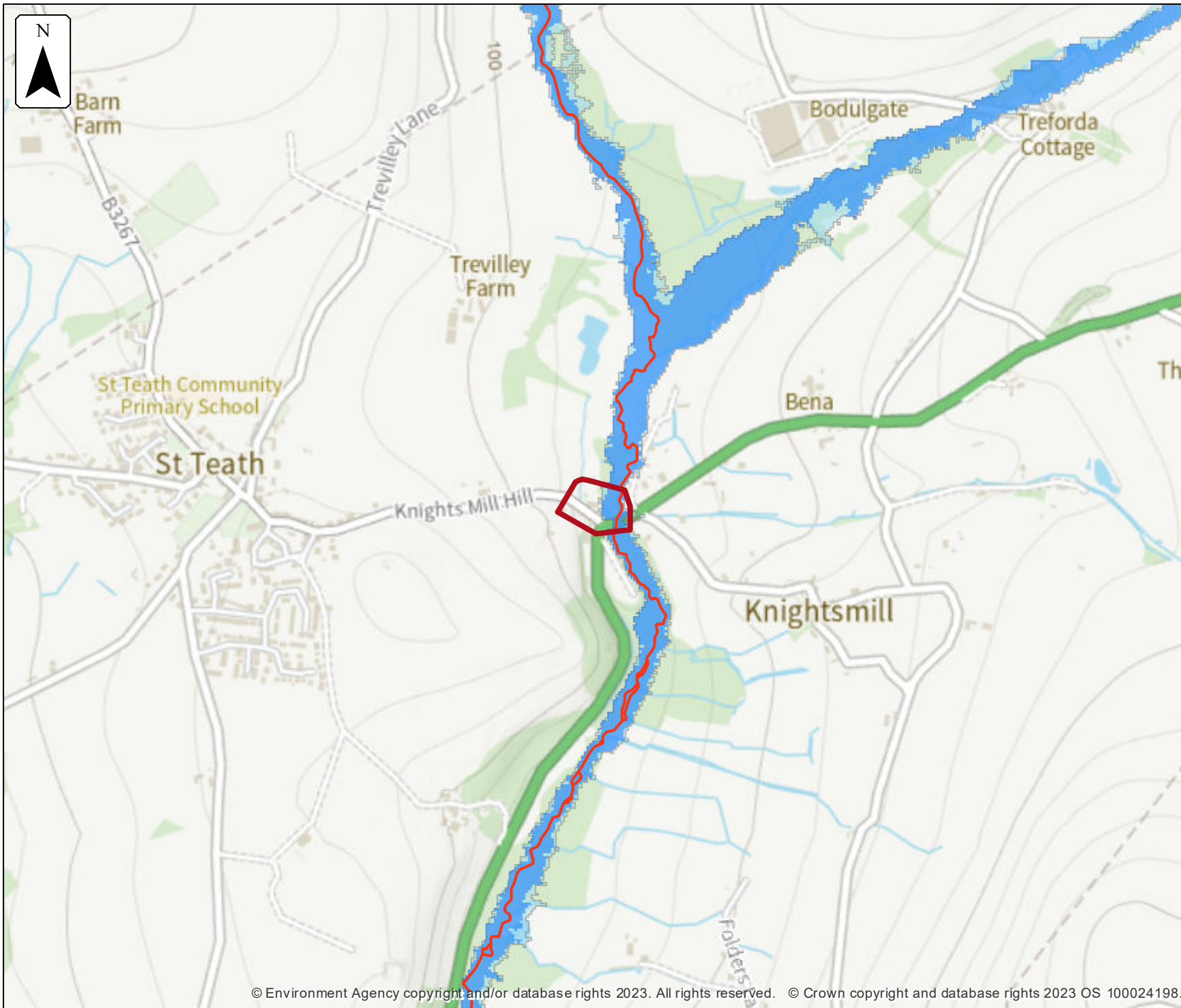
Flood map for planning

Location (easting/northing)
207100/80631

Scale
1:10,000

Created
8 Jun 2023

-  Selected area
-  Main river
-  Flood zone 3
-  Flood zone 2



Modelled data

About the models used

Model name: JFLOW

Date: 2007 & 2013

This model contains the most relevant data for your area of interest.

You will need to consider the [latest flood risk assessment climate change allowances](#) and factor in the new allowances to demonstrate the development will be safe from flooding.

Terminology used

Annual exceedance probability (AEP)

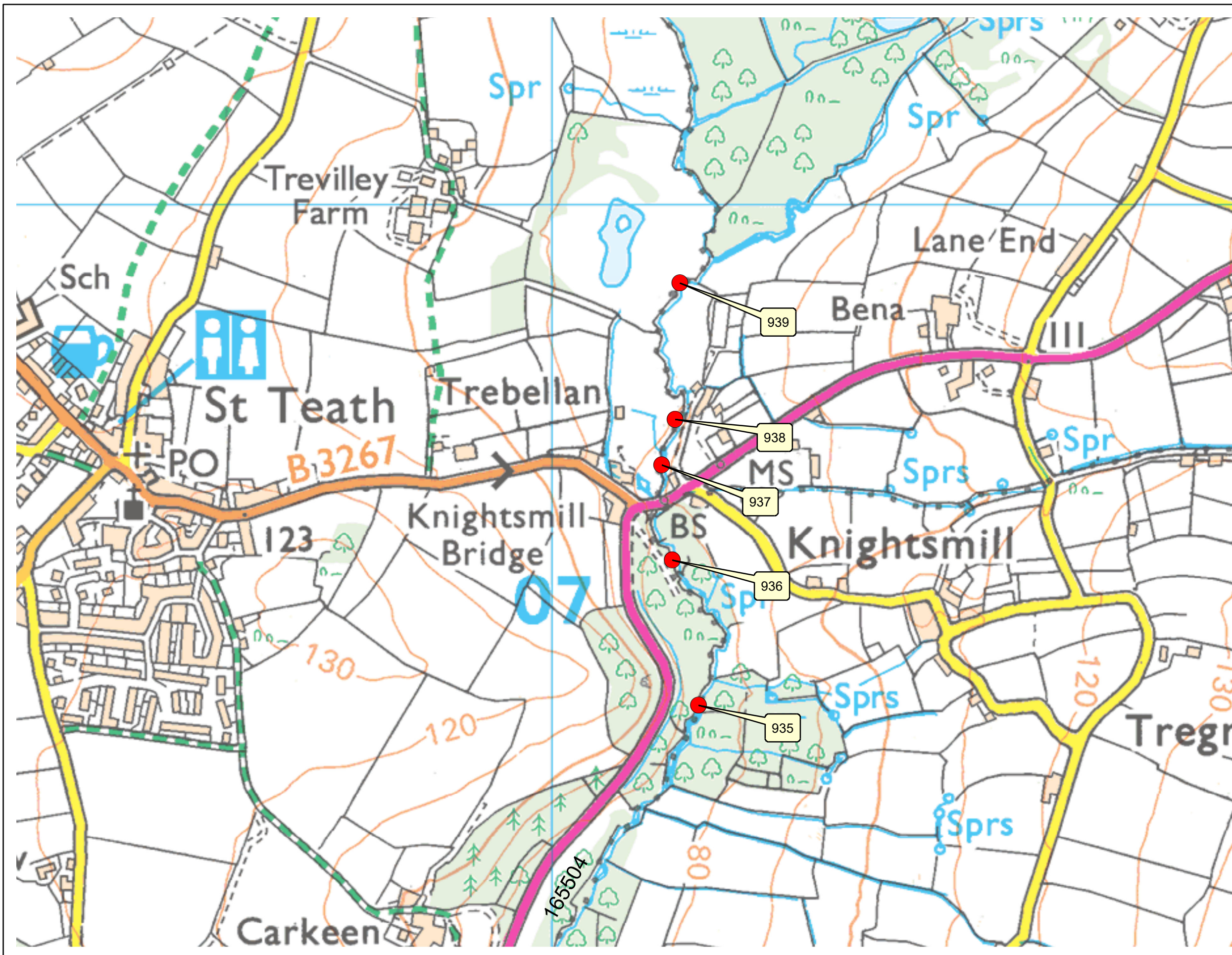
This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occurring in any one year, is described as 1% AEP.

Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

JFLOW Model Node Location Map

Please note this map is intended only as a guide - it is not accurate at individual property level



Legend

● JFLOW Model Node Locations

Please refer to the enclosed table, for modelled water level data, and the enclosed caveat when considering modelled levels.

1:5,000

Correct as of 08th June 2023



Modelled JFLOW Flood levels



This data is taken from the JFLOW model. Please refer to the attached caveat when considering JFLOW modelled levels.

Jflow Study: Jflow_2007

Node Reference	Easting	Northing	Modelled Flood levels, in mAOD	
			1% AEP (1 in 100 year)	0.1% AEP (1 in 1000 year)
935	207197	80333	77.64	77.74
936	207162	80527	79.78	79.94
937	207148	80654	80.94	81.15
938	207166	80715	81.45	81.58
939	207172	80897	83.17	83.38

Correct as of 08 / 06 / 2023



No defences exist modelled fluvial extent

Location (easting/northing)
207100/80631


Scale Created
1:10,000 8 Jun 2023

Model name
JFLOW 2013 - area

 Selected area

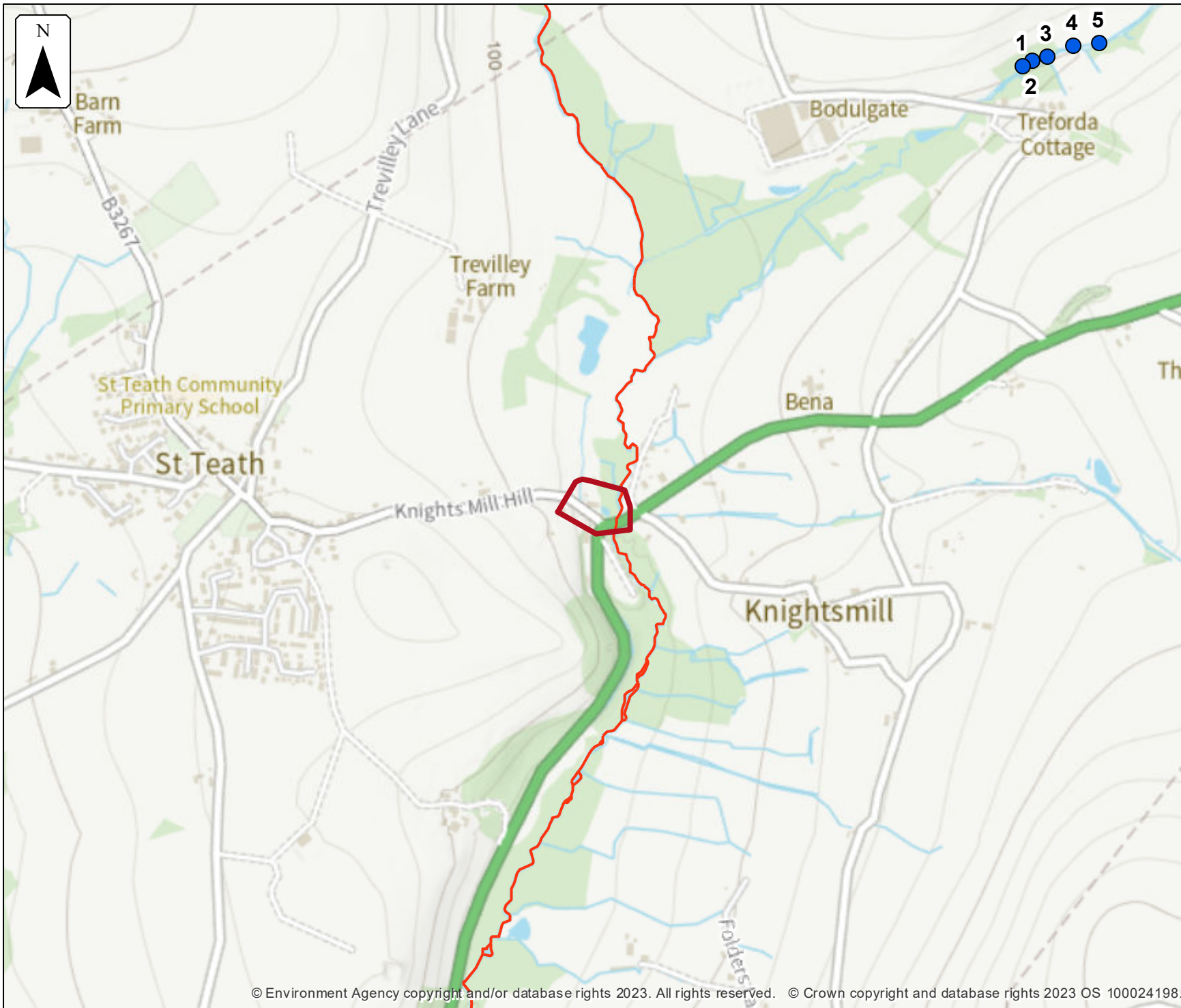
 Main river

Modelled flood extent

 1% AEP

Flood extents may not be visible where they overlap other return periods








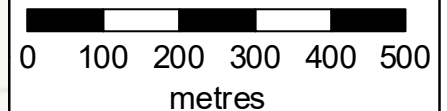
**No defences exist
modelled fluvial
node locations**

Location (easting/northing)
207100/80631

Scale Created
1:10,000 8 Jun 2023

Model name
JFLOW 2013 - area

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

No defences exist

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	347663	207926	81485							103.70	8.66			103.70	15.33
2	321348	207945	81496							104.41	8.59			104.60	15.20
3	161221	207975	81501							101.76	8.20			101.76	14.44
4	34633	208023	81524							102.46	8.02			102.52	14.13
5	281359	208074	81529							102.28	7.84			102.28	13.77

Data in this table comes from the JFLOW 2013 - Cornwall area model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.

Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

[Find out more about flood risk activity permits](#)

Help and advice

Contact the Devon Cornwall and the Isles of Scilly Environment Agency team at dcisenquiries@environment-agency.gov.uk for:

- [more information about getting a product 5, 6, 7 or 8](#)
- general help and advice about the site you're requesting data for

You asked us to provide you with depth / flow / water level data from the JFLOW model used to produce the Flood Zones.

The water depths have been produced from the JFLOW model (2007) as a 'by-product' of running the model to produce Flood Zones.

In 2013, over 600km of watercourses were remodelled using JFlow+. These watercourses were either previously not modelled in 2008, or where modelled using a lesser quality DTM. This project used an improved DTM, revised hydrology and the latest version of Jflow+.

You should be aware of the following points.

- Our work to produce Flood Zones followed a 10 year programme which delivered more detailed mapping for 821 locations. However, in order to complete Flood Zones we needed national coverage, hence a generalised approach was used to provide this national coverage within the time available, to fill the gaps between the 821 locations where we had more detailed information. The Flood Zones are therefore not as accurate as we would normally specify for river modelling, but they do provide an adequate indication of the extent of flood risk such that developers can consider flooding as part of their proposals to ensure they are not unknowingly putting additional lives at risk. This is the purpose for which the Flood Zones were produced
- Depths outputs were not specified when we commissioned this generalised modelling for Flood Zones. As the JFLOW modelling method was developed, tested and reviewed for production of the Flood Zone extents only, we currently have no information on the accuracy of the water depth data.
- The models were run using a Digital Terrain Model (DTM) with a grid generalised to between 5m and 100m (depending on the type of model and location, for reasons such as processing speed). Fluvial modelling produced depth data which can be processed using the DTM to provide water level data. However the differing grid sizes means that there is a significant potential for inaccuracy in producing level data, because of the DTM generalisation. Therefore because of the nature of the model and the DTM, in many cases it will not be possible to confidently assess whether or not a site is above the resulting water level. This is because there are further inherent uncertainties in the depth calculation and within the DTM itself.
- Depth or level outputs from the National Generalised Modelling (JFLOW) are suitable to be used for decision making at a broad catchment scale
- JFLOW and JFlow+ is a suitable method for broad scale flood mapping. It may however fail to produce satisfactory results in some locations.
- They are not suitable for use in site specific Flood Risk Assessments or Strategic Flood Risk Assessments and must not normally be used for these studies. However, where in exceptional circumstances Nationalised Generalised Modelling outputs are requested to be used for anything other than at a broad catchment or Shoreline Management Plan coastal cell scale further verification must be undertaken.
- For the 2013 data we can provide the data for the 100 year plus climate change scenario. The influence of climate change on expected flows for the 2080 planning horizon was represented by increasing the 1 in 100-year flood hydrograph by 30%.
- Any assessment of Flood Risk undertaken must be appropriate for the decisions that need to be based upon it, consider the risks and also take into account any limitations of the data used.
- Please be aware that the Environment Agency does not guarantee that this data is suitable for your purposes.

FIRST

Please check the latest Climate Change allowance :-

[Flood risk assessments: climate change allowances - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/612224/Climate_Change_Allowances_-_GOV.UK.pdf)

We expect you to use the scenario values as shown on the adjacent table for the different types of development. You may provide different scenario (i.e. High Cen for SLR) as additional assessment but we will use these values/allowances for our assessments of FRA/Designs

*CFB = Coastal Flood Boundary – available at data.gov.uk

Valid May 2022 – FCRM

DCIS Climate Change Allowances – Strategic and Development Planning

Development Vulnerability NPPG	Rainfall 1% Storms		River Less than 5km2		Fluvial	Sea Level Rise (SLR) Upper End
	Exe & East Devon	All others	Urban	Rural		
					Use 2080s values for all	Added to CFB* 2017 data
Commercial 60yr lifetime	30%	30%	30%	? - tbc	Central Allowance- See map next page	0.74m (2082 value)
Residential 100yr lifetime	45%	50%	50%	? - tbc	Central Allowance - see map next page	1.445m (2122 value)
Essential Infrastructure	45%	50%	50%	? - tbc	Higher Central - See map next page	Please confirm with EA office

SPDC@environment-agency.gov.uk or SW_Exeter-PSO@environment-agency.gov.uk



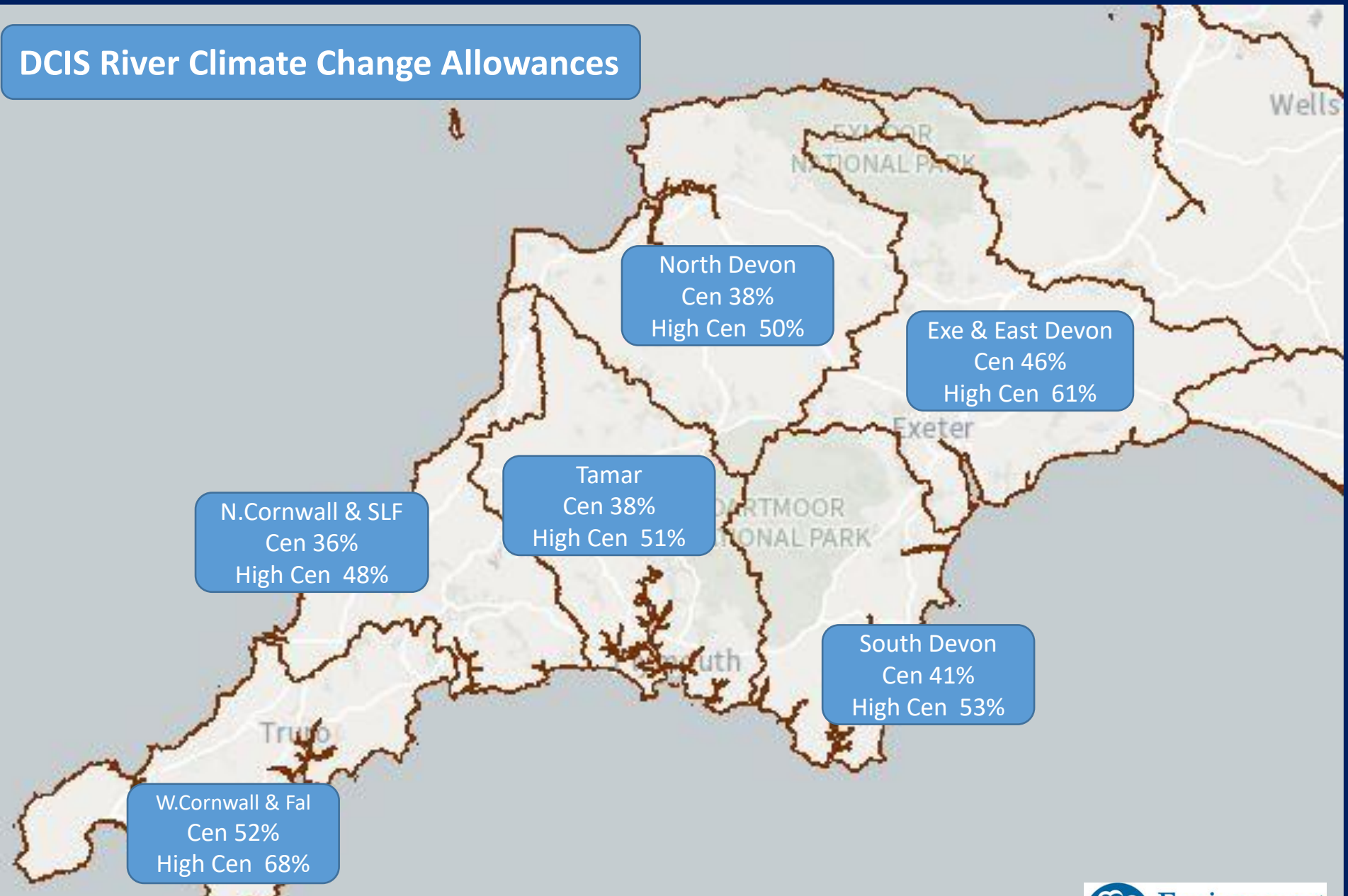
FIRST

Please check the latest Climate Change allowance :-

Flood risk assessments:
climate change allowances - GOV.UK
(www.gov.uk)

- Wave Actions (Coastal & Estuary) will also have to be considered
- Freeboard will need to be added to set minimum floor or defence levels
- +40%CC Modelled scenarios, may still be used for some catchments (>5% diff from new values).

DCIS River Climate Change Allowances



Valid May 2022 - FCRM

SPDC@environment-agency.gov.uk or SW_Exeter-PSO@environment-agency.gov.uk