PROPOSED CONTAINER ON FISHERMAN'S QUAY, PORTHLEVEN

J-15407

FLOOD RISK ASSESSMENT

nijhuis

Nijhuis Saur Industries | UK & Eire

PROPOSED CONTAINER ON FISHERMAN'S QUAY, PORTHLEVEN

FLOOD RISK ASSESSMENT

Report No.	Issue Detail	Originator	Date	Checked By	Date
01	Client	HG	08/08/2023	-	08/08/2023

For: Porthleven Harbour & Dock Company
Celtic House
Harbour Head
Porthleven
TR13 9JY

Job No: J-15407
Date: August 2023
Edition: 01

CONTENTS

APPENDICES

1.0 INTRODUCTION

Porthleven Harbour & Dock Company are proposing to site a container selling seafood on the Fisherman's Quay, Porthleven.

According to the Environment Agency (EA) interactive map, it is apparent that the site is within a Flood Zone 3 area, as such any submission for planning will require a Flood Risk Assessment (FRA). Therefore, it has been deemed necessary to produce a FRA for the site in accordance with the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG).

In order to address this requirement Nijhuis Industries UK and Eire Ltd. have been commissioned. The objective of this appointment is to prepare a FRA for the development in accordance with the best practice principles of NPPF and PPG regarding flood risk. This report describes the findings of the study.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The proposed site is located on The Fisherman's Quay, Porthleven. The Ordnance Survey Grid Reference (OSGR) for the site is SW 62796 25697. A plan showing the location of the site is shown in Figure 2.1 below.

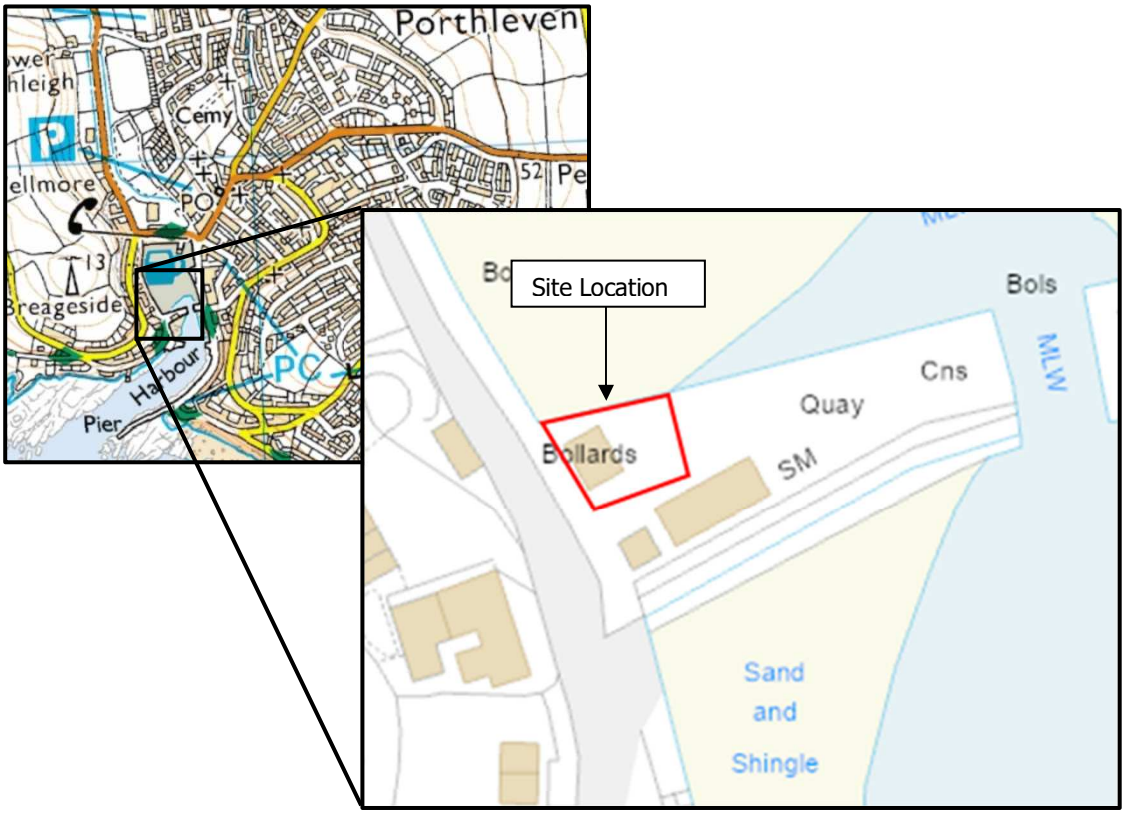


Figure 2.1 Site Location

2.2 Existing Usage

Currently the site is the Fisherman's Quay an area of hardstanding on Porthleven Harbour.

2.3 Proposed Usage

It is proposed to site a container to sell seafood on Fisherman's Quay, Porthleven.

3.0 EXISTING HYDROLOGY

Initial inspection of the EA indicative flood plain suggests that the site lies within Flood Zone 3 (Figure 3.1 below). At this location the flood risk to the site would be from tidal sources.

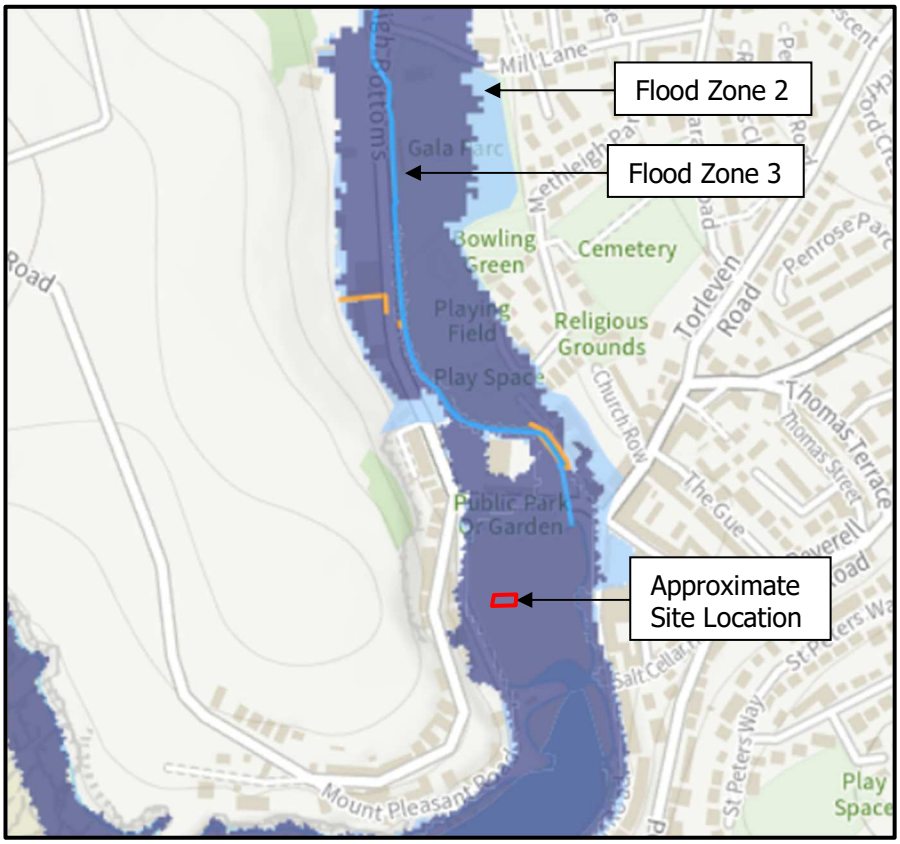


Figure 3.1. Extract from EA Indicative Flood Map

4.0 FLOODING MECHANISMS

A number of possible flooding mechanisms have been considered at the site, and are discussed below.

4.1 Groundwater Flooding

Investigation of ground water flooding has been undertaken within the Cornwall SFRA. The Cornwall SFRA states:

"Groundwater flooding is linked to the ability of the ground to hold water. Due to its geology Cornwall has only minor aquifers (2) and generally does not experience much groundwater type flooding. The exception to this is found in areas that have extensive mine drainage systems, where blockages within drainage tunnels can lead to unexpected breakout of groundwater at the surface."

The site is adjacent to a tidal waterbody, and as such the groundwater level beneath the site is likely to be largely controlled by this.

It is considered that groundwater flooding does not pose a significant risk to the development site and will not be considered further within this report.

4.2 Overland Sheet Flow

The development site is set in the harbour area of Porthleven. As such it is anticipated that the existing drainage infrastructure would collect and divert any flows from affecting the proposed development. The Environment Agency surface water map below shows that the site is at very low risk of flooding from surface water. Therefore, this mechanism is not considered further in this report.

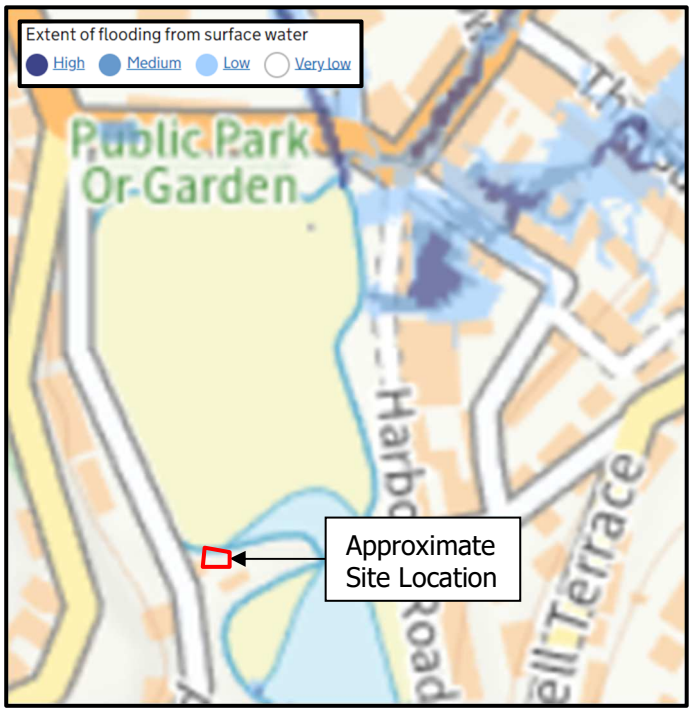


Figure 4.1 Environment Agency Risk of Surface Water Flooding Map Extract

4.3 Fluvial (River) Flooding

The Environment Agency indicative flood map (Figure 3.1) shows that the site is located within Flood Zone 3. However, due to the absence of any nearby watercourse that could impact the site, this mechanism of flooding will not be considered further.

4.4 Tidal Flooding

Due to the location of the site, it is anticipated that the site may be at risk from tidal flooding. This mechanism of flooding is considered further in **Section 5** of this report.

4.5 Flooding as a Result of Development

The proposed development will replace existing hard-standing area with a container. Therefore, there will be no increase in the impermeable area of the site. This mechanism of flooding will not be considered further in this report.

5.0 TIDAL FLOODING

The EA's indicative flood map in Figure 3.1 suggests that the site is located in Flood Zone 3. The risk of flooding is therefore considered to be significant.

Flood level information has been obtained from the EA for this location. The information provided tidal flood depths and levels for the site. The information is included in **Appendix A**.

The tidal flood information for the site has been taken from the GMC Porthleven 2018 model.

The information provided flood depths and levels for a series of nodes in the vicinity of the site. As there are a few nodes that cover the area of the proposed container, the highest flood depth will be considered.

Based on the defended modelled tidal extent the flood depth for the 1 in 200 year event at the site is 0.52m.

When the defences are removed the 1 in 200 year tidal flood depth for the site is 0.63m.

The location of the site means that it may be susceptible to wave action. This hasn't been accounted for within the tidal flood levels. In addition to this, climate change has not been accounted for in the tidal levels. From the information provided by the EA the sea level rise for a commercial development in this area would be 0.74m. This would then make the tidal flood depth a minimum of 1.37m. With a further allowance of 600mm for any wave action the flood depths would be 1.97m.

From the information above, the proposed site would be at risk of tidal flooding during the extreme flood events considered.

6.0 FLOOD RISK MITIGATION MEASURES

The proposal is to site a container on Fisherman's Quay, Porthleven. The flood information has shown that the site will be inundated with flood water during an extreme tidal flood event.

The mitigation measures are recommended to try to minimise damage to the site should a flood event occur.

All fixtures, fittings and finishes should be constructed using flood resilient/resistant materials where possible. Further information regarding flood resilient construction can be found at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7730/flood_performance.pdf

The site should sign up for the Environment Agency's Flood Warning System. This will ensure prior warning of a possible flood event and allow adequate time to prepare for flooding. EA standing advice is given below.

Figure 6.1. EA Standing Advice

The nature of tidal flooding means that it is predictable in advance, therefore it is likely the site would receive sufficient warning.

Based on the nature of the development being a container selling seafood the site can be avoided during an extreme flood event, this will eliminate the risk to any visitors. Due to the location it is likely that during any adverse weather conditions the general public will avoid this area of Porthleven on the quay surrounding the tidal waters.

7.0 ACCESS AND EGRESS

The main access and egress route for the proposed development is northwards towards The Square which is also deemed subject to flooding. Access from the site should be taken in a south-westerly direction along Mount Pleasant Road where the road rises up and out of the floodplain as shown in the figure below. This will offer the quickest and safest access route from the site.

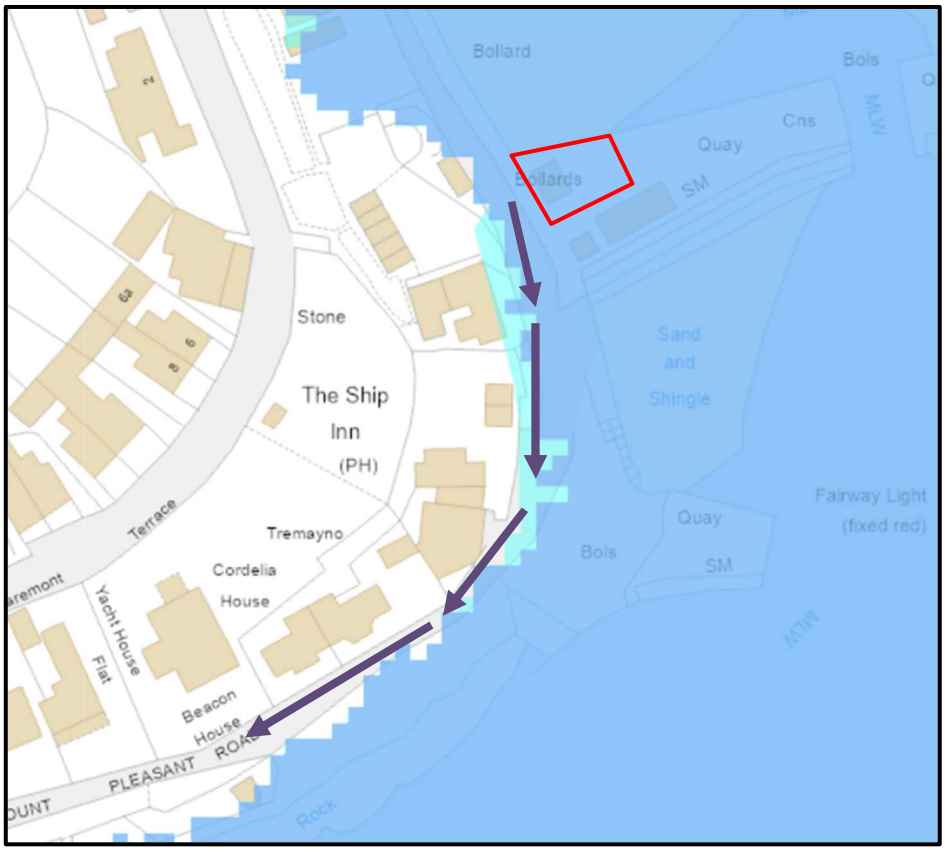


Figure 7.1. Access from Proposed Restaurant

8.0 POLICY

The development has been shown to be located within Flood Zone 3. In accordance with PPG Table 2, a development of this type *"Buildings used for …restaurants; cafes; …storage; …leisure"* is classified as 'Less Vulnerable'. Referring to Table 3 of PPG a 'Less Vulnerable' development within Flood Zone 3 deemed to be appropriate on a flood risk basis subject to the Sequential Test.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Figure 8.1 PPG Table 3

9.0 CONCLUSIONS AND RECOMMENDATIONS

This investigation has shown that the proposed siting of a container is located within Flood Zone 3 according to EA information. All other mechanisms of flood risk to the site have been investigated and the site has been found to be at low risk from all other anticipated forms of flooding.

The risk of tidal flooding would result in the inundation of the site during an extreme tidal flood event. Therefore, mitigation measures have been proposed to try and limit the damage of any flood event. The site is recommended to be signed up to the EA Flood Warning System to allow the site to prepare for potential flooding.

The access and egress route has been shown to be at risk immediately adjacent to the site. It is noted that the access rises up and out of the floodplain to the south-west of the site.

The proposed development is considered to be a less vulnerable development in-line with Table 2 of PPG. As the site is located within Flood Zone 3 and referring to Table 3 of PPG the site is deemed to be appropriate subject to the Sequential Test.

APPENDIX A EA FLOOD INFORMATION

Flood risk assessment data

Location of site: 162811 / 25687 (shown as easting and northing coordinates)
Document created on: 7 August 2023
This information was previously known as a product 4.
Customer reference number: 7DTR3GTMTMA6

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

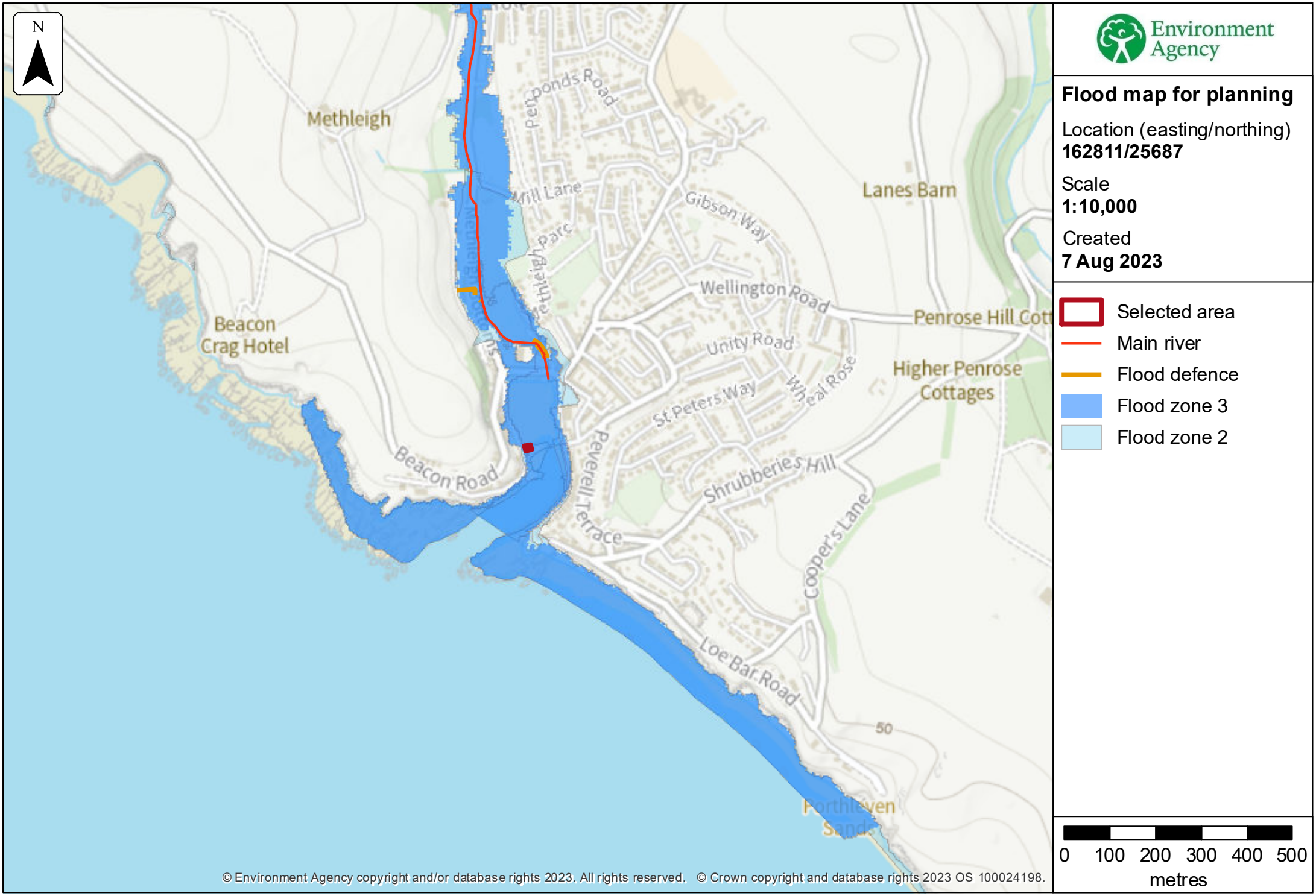
Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- 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.



Environment Agency

Flood map for planning

Location (easting/northing)
162811/25687

Scale
1:10,000

Created
7 Aug 2023

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

0 100 200 300 400 500
metres

Historic Information

The map below is an indicative outline of areas that have previously flooded.

Historic outlines may not be visible where they overlap. You can download the outlines separately via the link below.

Download recorded flood outlines in GIS format

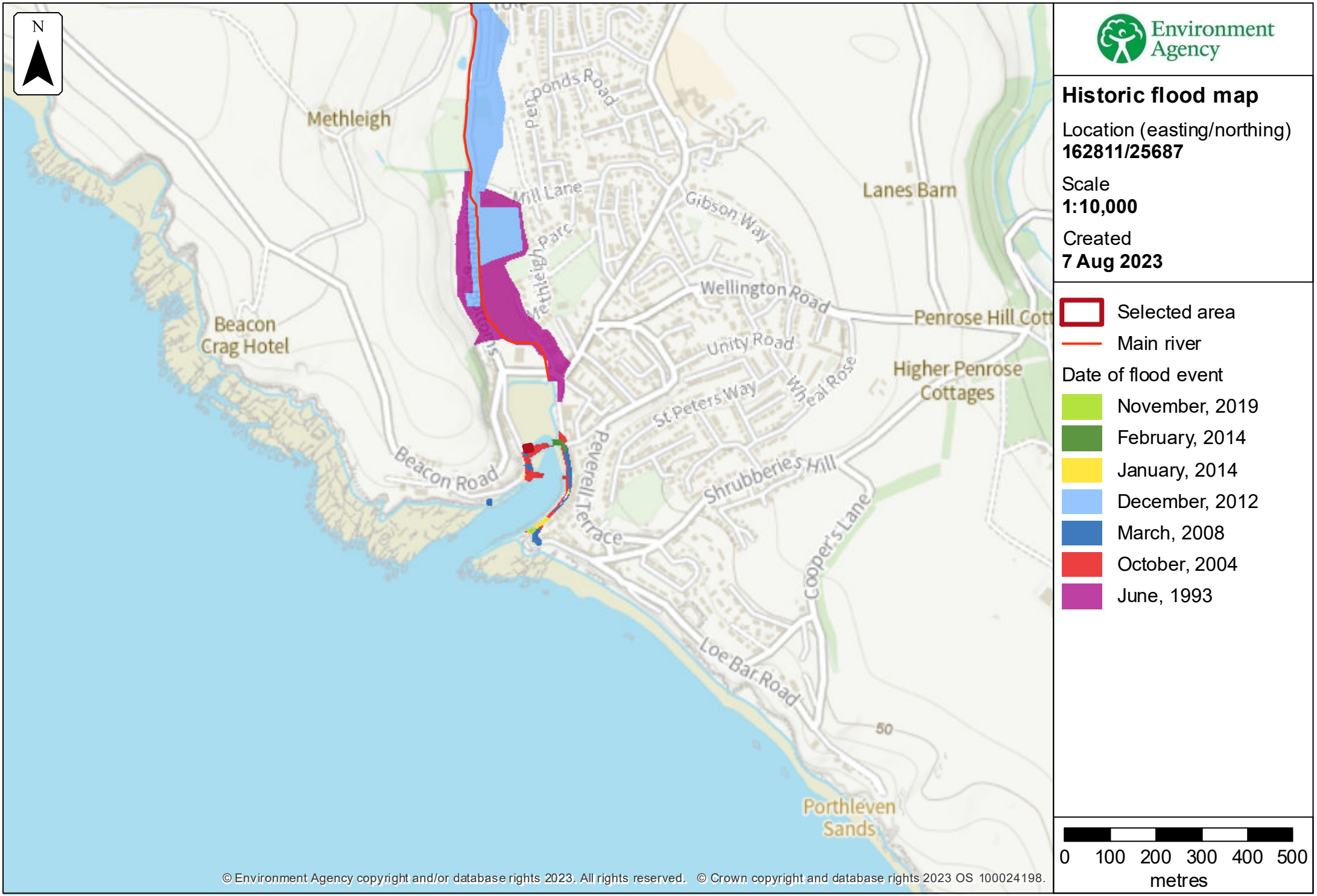
Our historic flood event outlines:

- are an indication of the geographical extent of an observed flood event. We map flooding to land, not individual properties.
- not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.
- are based on a combination of anecdotal evidence, Environment Agency staff observations and survey.
- do not provide a definitive record of flooding.

It is possible that there will be an absence of data in places where we have not been able to record the extent of flooding. It is also possible for errors to occur in the digitisation of historic records of flooding.

Remember that: other flooding may have occurred that we do not have records for

Please note that our records are not comprehensive. We would therefore advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.



Environment Agency

Historic flood map

Location (easting/northing)
162811/25687

Scale
1:10,000

Created
7 Aug 2023

- Selected area
- Main river

Date of flood event

- November, 2019
- February, 2014
- January, 2014
- December, 2012
- March, 2008
- October, 2004
- June, 1993

0 100 200 300 400 500
metres

Historic flood event data

Start date	End date	Source of flood	Cause of flood	Affects location
2 November 2019	2 November 2019	sea	overtopping of defences	No
5 February 2014	5 February 2014	sea	overtopping of defences	No
3 January 2014	3 January 2014	sea	overtopping of defences	No
22 December 2012	22 December 2012	main river	obstruction/blockage - bridge	No
10 March 2008	10 March 2008	sea	other	No
27 October 2004	27 October 2004	sea	channel capacity exceeded (no raised defences)	Yes
9 June 1993	9 June 1993	main river	channel capacity exceeded (no raised defences)	No

Flood defences and attributes

The flood defences map shows the location of the flood defences present.

The flood defences data table shows the type of defences, their condition and the standard of protection. It shows the height above sea level of the top of the flood defence (crest level). The height is In mAOD which is the metres above the mean sea level at Newlyn, Cornwall.

It's important to remember that flood defence data may not be updated on a regular basis. The information here is based on the best available data.

Use this information:

- to help you assess if there is a reduced flood risk for this location because of defences
- with any information in the modelled data section to find out the impact of defences on flood risk


N
2
3
4
5
6
1
7
Public Park Or Garden
Shute Lane
Prospect Place
Peverell Road
Salt Cellar Hill
St Peters Way
Beacon Road
Mount Pleasant Road
Harbour Road
Cliff Road
Peverell Terrace
Playing Field
Elliston Gardens
The Gue
Environment Agency
Flood defences
Location (easting/northing)
162811/25687
Scale
1:2,500
Created
7 Aug 2023
Selected area
Main river
Flood defence
0 25 50 75 100
metres
© Environment Agency copyright and/or database rights 2023. All rights reserved. © Crown copyright and database rights 2023 OS 100024198.

Flood defences data

Label	Asset ID	Asset Type	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	397186	Quay				
2	78080	Wall	Fair	6.19	6.16	
3	80282	Wall	Good	4.89	4.91	
4	98431	Wall	Good	7.74	7.82	
5	80251	Wall	Good	5.77	5.73	
6	397184	Quay				
7	397179	Quay				

Any blank cells show where a particular value has not been recorded for an asset.

Modelled data

About the models used

Model name: Porthleven Coastal Generalised Model
Date: 2018

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.

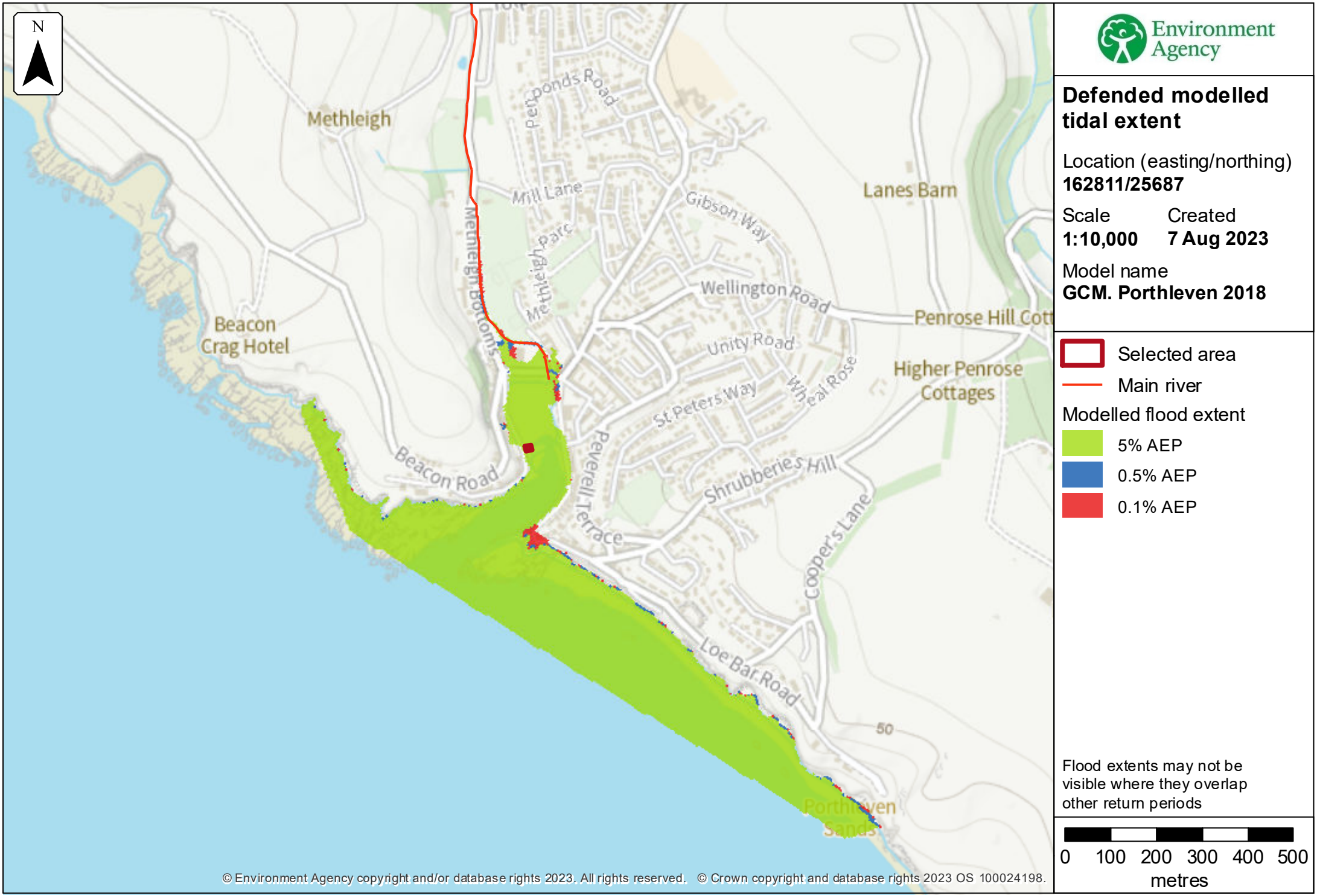
Terminology used

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 occuring 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.



Environment Agency

Defended modelled tidal extent

Location (easting/northing)
162811/25687

Scale
1:10,000

Created
7 Aug 2023

Model name
GCM. Porthleven 2018

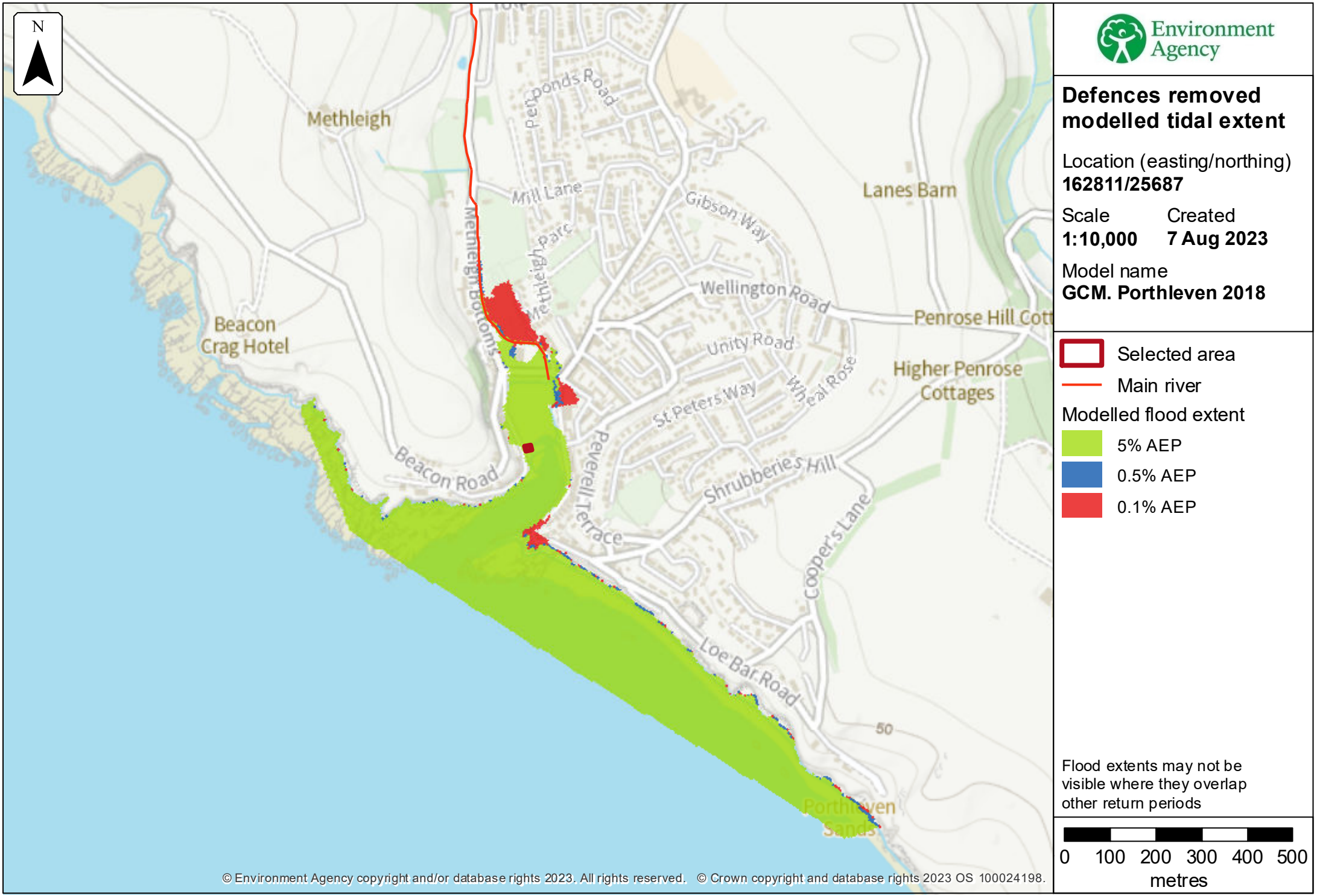
- Selected area
- Main river

Modelled flood extent

- 5% AEP
- 0.5% AEP
- 0.1% AEP

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

0 100 200 300 400 500
metres



Environment Agency

Defences removed modelled tidal extent

Location (easting/northing)
162811/25687

Scale
1:10,000

Created
7 Aug 2023

Model name
GCM. Porthleven 2018

Selected area

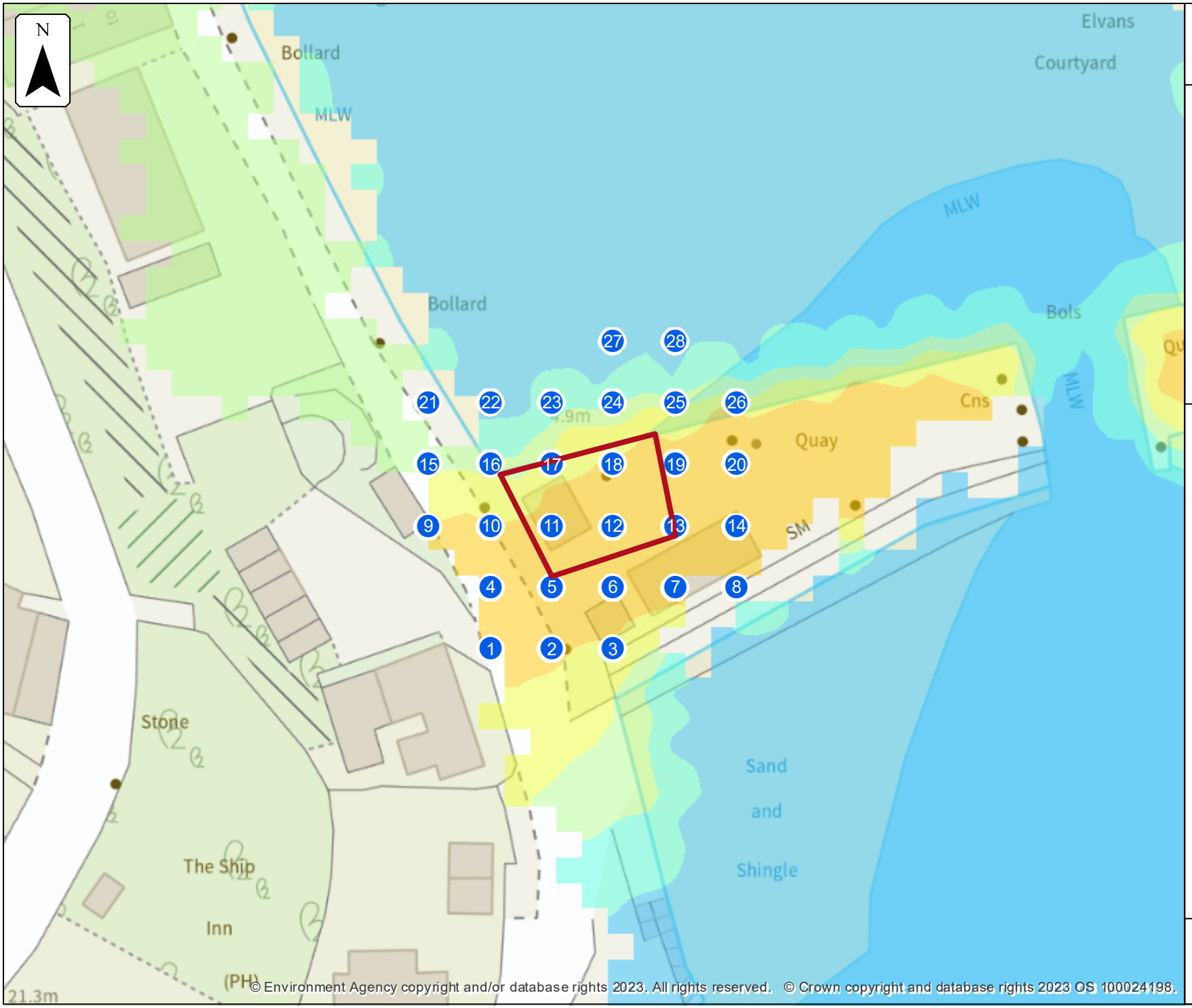
Main river

Modelled flood extent

- 5% AEP
- 0.5% AEP
- 0.1% AEP

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

0 100 200 300 400 500
metres



Environment Agency

Defended modelled tidal extent and height

Location (easting/northing)
162811/25687

Scale
1:500

Created
7 Aug 2023

Model name
GCM. Porthleven 2018

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 4.0
- 4.0 - 4.25
- 4.25 - 4.5
- 4.5 - 4.75
- 4.75 - 5.0
- 5.0 - 5.25
- 5.25 - 5.5
- 5.5 - 5.75
- 5.75 - 6.0

This map shows the 0.1% AEP height data

0 5 10 15 20
metres

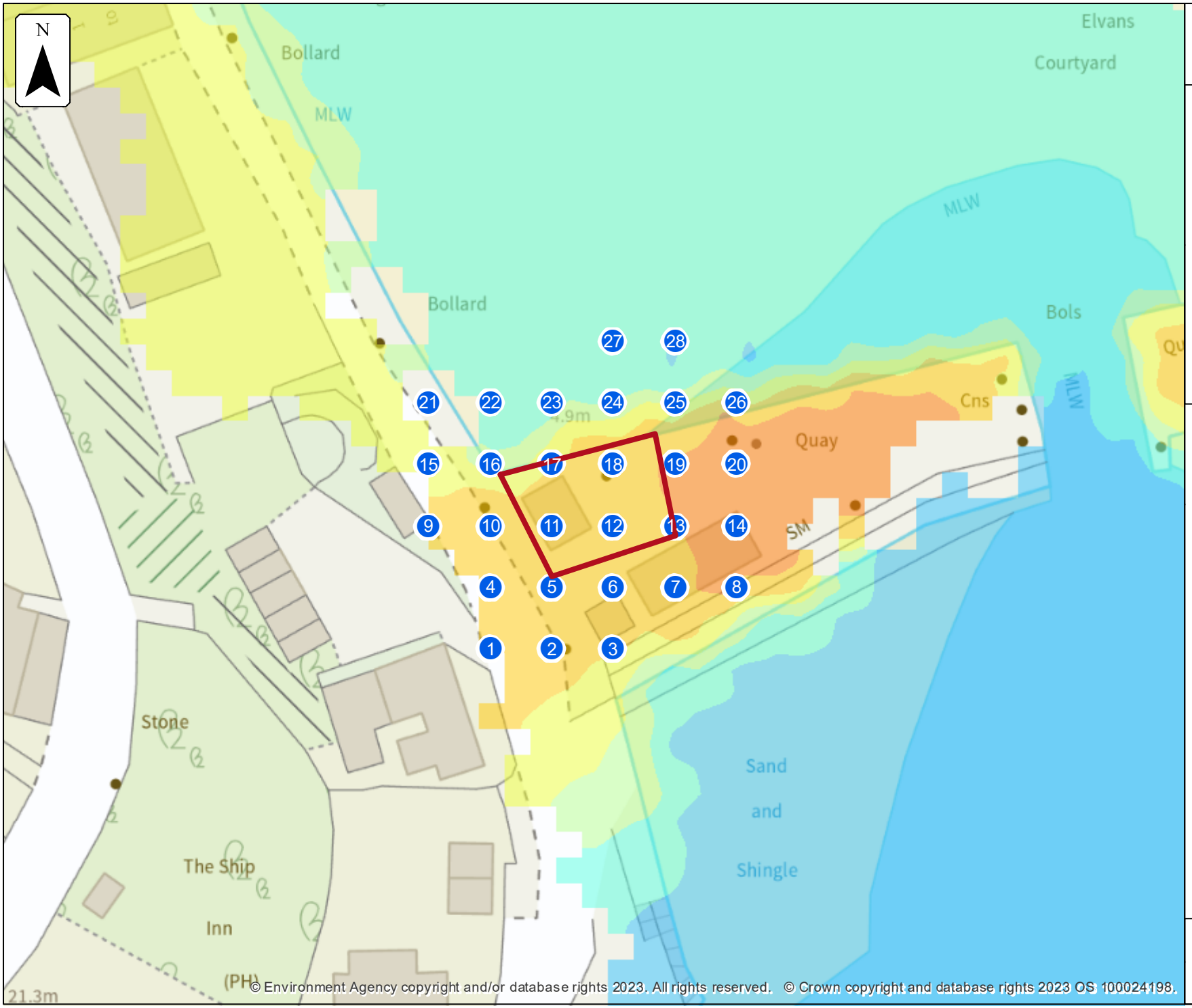
Sample point data

Defended

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
1	162800	25672	0.16	5.25							0.18	5.27	0.19	5.29
2	162806	25672	0.37	5.25							0.39	5.27	0.40	5.29
3	162812	25672	0.05	5.18							0.06	5.22	0.07	5.22
4	162800	25678	0.50	5.26							0.52	5.28	0.54	5.30
5	162806	25678	0.57	5.25							0.60	5.28	0.61	5.29
6	162812	25678	0.24	5.25							0.26	5.27	0.28	5.29
7	162818	25678	0.12	5.26							0.13	5.28	0.13	5.30
8	162824	25678	NoData	NoData							NoData	NoData	NoData	NoData
9	162794	25684	NoData	NoData							NoData	NoData	NoData	NoData
10	162800	25684	0.29	5.25							0.31	5.27	0.33	5.29
11	162806	25684	0.42	5.25							0.44	5.28	0.46	5.30
12	162812	25684	0.50	5.26							0.52	5.28	0.54	5.30
13	162818	25684	0.44	5.27							0.47	5.30	0.49	5.32
14	162824	25684	0.21	5.32							0.23	5.36	0.25	5.40
15	162794	25690	0.39	4.93							0.40	4.94	0.41	4.95
16	162800	25690	1.42	4.19							1.76	4.67	1.57	4.41

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
17	162806	25690	0.05	4.76							0.06	5.00	0.07	4.89
18	162812	25690	0.50	5.22							0.52	5.27	0.54	5.28
19	162818	25690	0.30	5.29							0.33	5.33	0.36	5.35
20	162824	25690	0.30	5.32							0.35	5.37	0.38	5.40
21	162794	25696	NoData	NoData							NoData	NoData	NoData	NoData
22	162800	25696	0.16	3.41							0.20	4.29	0.18	3.80
23	162806	25696	2.71	3.61							3.27	4.39	2.95	3.96
24	162812	25696	0.66	4.26							0.80	4.73	0.72	4.48
25	162818	25696	0.01	4.63							0.01	4.95	0.01	4.80
26	162824	25696	0.10	5.24							0.13	5.30	0.16	5.31
27	162812	25702	4.30	3.41							5.18	4.29	4.69	3.80
28	162818	25702	4.43	3.41							5.30	4.29	4.81	3.80

Data in this table comes from the GCM. Porthleven 2018 model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.



Environment Agency

Defences removed modelled tidal extent and height

Location (easting/northing)
162811/25687

Scale
1:500

Created
7 Aug 2023

Model name
GCM. Porthleven 2018

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 4.0
- 4.0 - 4.25
- 4.25 - 4.5
- 4.5 - 4.75
- 4.75 - 5.0
- 5.0 - 5.25
- 5.25 - 5.5
- 5.5 - 5.75
- 5.75 - 6.0

This map shows the 0.1% AEP height data

0 5 10 15 20
metres

Sample point data

Defences removed

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
1	162800	25672	0.23	5.33							0.27	5.37	0.30	5.40
2	162806	25672	0.44	5.32							0.48	5.36	0.50	5.39
3	162812	25672	0.10	5.25							0.13	5.29	0.15	5.32
4	162800	25678	0.58	5.34							0.62	5.38	0.65	5.41
5	162806	25678	0.65	5.33							0.69	5.37	0.72	5.40
6	162812	25678	0.31	5.33							0.35	5.36	0.38	5.39
7	162818	25678	0.15	5.33							0.18	5.41	0.21	5.43
8	162824	25678	NoData	NoData							0.05	5.52	0.07	5.55
9	162794	25684	NoData	NoData							NoData	NoData	NoData	NoData
10	162800	25684	0.37	5.33							0.41	5.37	0.44	5.40
11	162806	25684	0.50	5.34							0.54	5.38	0.57	5.41
12	162812	25684	0.58	5.35							0.62	5.39	0.66	5.42
13	162818	25684	0.54	5.38							0.59	5.42	0.62	5.46
14	162824	25684	0.29	5.48							0.34	5.56	0.39	5.62
15	162794	25690	0.44	4.99							0.46	5.01	0.47	5.03
16	162800	25690	1.59	4.46							1.76	4.72	1.85	4.84

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
17	162806	25690	0.09	4.94							0.11	5.08	0.12	5.16
18	162812	25690	0.59	5.34							0.63	5.40	0.67	5.44
19	162818	25690	0.42	5.42							0.48	5.48	0.53	5.53
20	162824	25690	0.47	5.49							0.56	5.58	0.63	5.64
21	162794	25696	NoData	NoData							NoData	NoData	NoData	NoData
22	162800	25696	0.18	3.86							0.20	4.31	0.21	4.51
23	162806	25696	3.00	4.02							3.28	4.42	3.41	4.60
24	162812	25696	0.73	4.53							0.80	4.79	0.84	4.91
25	162818	25696	0.01	4.86							0.01	5.04	0.07	5.14
26	162824	25696	0.22	5.38							0.28	5.46	0.34	5.52
27	162812	25702	4.76	3.87							5.21	4.32	5.41	4.52
28	162818	25702	4.88	3.86							5.32	4.31	5.53	4.51

Data in this table comes from the GCM. Porthleven 2018 model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that 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

Nijhuis Industries UK & Ireland | info.uk@nijhuisindustries.com **|** www.nijhuissaurindustries.com/uk

Main Office: +44 (0)333 7000 007

Truro Office | Nanjerrick Court, Allet **|** Truro, Cornwall **|** TR4 9DJ | United Kingdom