

Reference: ST-3472/2510-LLFA Response

Response to the LLFA's comments to
Planning Application (Ref: 25/01094/FP)

This document is prepared in support of a planning application for the erection of 9No. dwellings including access, parking and landscaping at Duncots Close, Ickleford, Hitchin, Hertfordshire, SG5 3UU. This document seeks to provide further information relating to the Lead Local Flood Authority (LLFA) comments, dated 30th September 2025.

The following information has been provided in support of this document:

- **Appendix A:** Detailed Drainage Strategy
- **Appendix B:** EA Product 4 Data
- **Appendix C:** Microdrainage Output Files

The letter from the LLFA recommends an objection in the absence of an acceptable Flood Risk Assessment (FRA) / supporting information.

The LLFA comments and Stomor's related replies are as follows:

1. *Development lies partly within Flood Zone 2 and flood risk may be increased both on and off site.*
 - *The site has been assessed as being located in fluvial Flood Zone 1, however, the site is partly within Flood Zone 2, as shown on the Environment Agency's Flood Map for Planning. We recommend that the FRA is updated with the most recent Environment Agency's mapping.*
 - *The sequential approach needs to be followed, using the following hierarchy:*
 - *How can the development first avoid the risk of flooding*
 - *How will it be mitigated (with evidence)*
 - *How will flood resistance and resilience be employed*
 - *The location of development should be checked against all sources of flooding.*
 - *The LLFA would recommend that the applicant provides an overlay of the fluvial flood extents and surface water flood extents on the drainage strategy to demonstrate there is no development or drainage elements located in the fluvial or surface water flood risk.*
 - *The FRA must demonstrate that the development is safe from flood risk for the lifetime of the development and that it will not increase flood risk elsewhere.*
 - *If there is to be development within Flood Zone 2, floodplain compensation must be provided.*
 - *Finished Floor Levels (FFLs) should be set at least 300mm above all sources of flood risk and maximum design water level, or a minimum of 150mm above proposed ground levels, for flood resilience. This will be beneficial for design storms, exceedance events and the long-term sustainability of the development.*
 - *A plan showing the exceedance flow paths across the site should be provided.*

The detailed drainage strategy is provided in **Appendix A**. Environment Agency (EA) Flood Data was requested for the site and is attached in **Appendix B**.

The EA Product 4 data shows that there is “No Data” for the node locations within the site. The guidance states that where “No Data” is shown, then there is no flood risk for that return period for that node location.

The EA Flood Data has shown that the nearest nodes to the site are 5 and 7, with the 1% AEP at 48.63m AOD for Node 5 and 48.94m AOD for Node 7, and the 0.1% AEP at 48.80m AOD for Node 5 and 49.13m AOD for node 7 respectively. The lowest top of bank level for the swale is 49.80m AOD, and thus the swale levels are outside both Flood Zones 2 and 3.

The detailed drainage strategy (**Appendix A**) demonstrates how the proposed development can be effectively drained, and the amount of storage required to avoid flooding within the site during all storms up to and including the 1 in 100-year storm event plus a 40% allowance for climate change.

Based upon the above, it is considered that there is no fluvial flood risk to the site up to the 1 in 1000 year plus climate change scenario.

2. *Detailed drainage layout and hydraulic calculations have not been provided to show that the risk of flooding can be adequately managed.*
 - *A detailed drainage layout plan should be fully labelled and show details (e.g. pipe numbers, gradients, diameters, locations, and manhole details) of every element of the proposed drainage system (including all SuDS and pipes). Pipe numbers and nodes should be shown on the drainage layout and correspond with the supporting hydraulic calculations.*
 - *Whilst a drainage layout and hydraulic calculations have been provided, we note the following:*
 - *Source control calculations for the attenuation have been submitted. At this stage for a full application, full network calculations should be provided for the entire drainage system and all SuDS components, including the permeable paving, roof discharge, to show the performance of the system in relation to the detailed drainage network.*
 - *Details of all components of the drainage network should be indicated and labelled the same in both the calculations and drainage strategy for clarity.*
 - *The swale should be designed to have 1 in 3 slopes.*
 - *The hydraulic calculations submitted for attenuation in support of the application use outdated parameters. We recommend updated calculations using the following parameters are provided:*
 - *Calculations should be updated to FEH2013 or FEH2022 to support drainage modelling calculations. For the avoidance of doubt the use of FSR and FEH1999 data has been superseded and therefore, use in rainfall simulations are not accepted. (currently the calculations are informed by the outdated FSR data).*

- Network calculations for all events up to and including the 1% AEP+ 40% climate change event should be provided including an appropriate climate change allowance for the 3.33% AEP design flood event and with CV values of 1.
- 10% urban creep should be added to all areas that could increase in size or become impermeable for example roofs, patio and driveways.

The detailed drainage strategy (**Appendix A**) is fully labelled with details of all elements of the drainage system, which correspond to the Micro Drainage calculations provided in **Appendix B**. The Micro Drainage calculations have been updated to reflect the full network. The drainage strategy allows for 10% urban creep. The swale has been designed with 1 in 3 slopes.

The hydraulic calculations have been updated and are provided in **Appendix C**. These cover all events up to and including the 1% AEP+ 40% climate change event.

- Further commentary on the surface water outfall needs to be provided. If the applicant is planning to discharge into an existing watercourse, the following information is required:
 - Confirm the discharge location to the ditches are within the applicant's ownership (they are showing to be outside the redline boundary) or that the applicant has the relevant permissions to discharge. If they are not within the applicant's ownership, then an agreement in principle needs to be provided.

The outfall is to an existing ditch located on the northern boundary of the land to the north of the development site. This land is owned by persons who the developer has associated permissions and rights in perpetuity to ascertain associated with the proposed drainage outfall. Figure 1 below shows the title boundary extent of the land to the north, which shows that the ownership extends into the existing ditch, which would create riparian rights for the landowner.



FIGURE 1: Title Boundary overlay with topographical survey at outfall

- *Condition of watercourse*

The topographical survey identified that the watercourse is free flowing, with no blockages. Should any remediation works be required, the respective landowner would be required to ensure the watercourse is free flowing in accordance with the Land Drainage Act.

- *Capacity of the watercourse. The applicant must demonstrate that the watercourse has sufficient available capacity to cope with the surface water from the site during a storm event.*

The watercourse is a tributary that extends approximately 85m from the River Purwell. The flows from the site will be restricted to 1l/s for all storm events up to and including the 1 in 100 year storm event, plus an allowance for climate change. The land between the site and the River Purwell, along the route of the tributary, is a floodplain, so there is no downstream risk to any users or buildings. Based upon the above, the 1l/s discharge rate from the site to the receiving tributary is not considered to pose a risk based upon capacity.

- *Connectivity of the watercourse – does it have onward connectivity to the main river?*



FIGURE 2: Photograph locations

Figure 2 shows the location of the following series of photographs:



Photo A: Photo looking west towards tributary across River Purwell



Photo B: Photo looking east of culvert outfall into tributary to River Purwell



Photo C: Photo of existing ditch looking south towards the site



Photo D: Photo looking north at culvert of ditch

- Confirmation should also be provided that the swale sits outside Flood Zone 2.

As discussed above, the lowest top of bank level for the swale is 49.80m AOD, and thus is outside both Flood Zones 2 and 3.

3. *There is no evidence the Sustainable Drainage Systems (SuDS) hierarchy has been followed in full.*
 - *We are highly supportive of the proposed use of SuDS like permeable paving and swales. Evidence that all stages of the SuDS hierarchy have been followed is required. We recommend that further consideration of other forms of above-ground SuDS like rain gardens would provide some additional attenuation volume as well as distribute biodiversity and amenity benefits throughout the site.*
 - *Where possible, more SuDS features should be incorporated in the drainage strategy. If they cannot be incorporated, evidence should be provided to show why they are not viable. SuDS features should incorporate the 4 pillars of sustainable drainage which are water quality, water quantity, biodiversity and amenity benefits, as per the National Standards for SuDS (2025)*

A review of the existing scenario was undertaken in the FRSS. Existing surface water runoff from the site currently runs overland to the east, towards the River Purwell. There are no public surface water sewer within the vicinity of the site. The public sewer records are shown in *Figure 2*.



FIGURE 2: AWS Sewer Records Map Extract

Greenfield runoff rates have been calculated based upon the IH124 Method, for a development area of 0.4ha. Geotechnical information from the WRAP map of the Wallingford Procedure indicates that the underlying soil conditions would reflect Winter Rain Acceptance Potential (WRAP) Soil Class 3, which gives flow rates as follows:

Greenfield Runoff (l/s)		
1 in 1 year	Q1	0.81
1 in 30 years	Q30	2.29
1 in 100 years	Q100	3.33

The site is currently greenfield with no impermeable area. The proposed development will have a hardstanding area of 0.217ha.

In accordance with national guidance, the order of consideration for the disposal of surface water runoff from a development should be as follows: collected for non-potable uses, infiltration methods, watercourses, then public sewer network.

- 1. Collection for non-potable uses:** water butts will be considered for each plot to provide some additional attenuation volume as well as distribute biodiversity and amenity benefits throughout the site.
- 2. Infiltration Methods:** the site-specific SI report identified that infiltration methods would not be suitable for the disposal of surface water runoff due to the high groundwater table observed.

3. **Watercourses:** surface water runoff from the site would run overland towards the River Purwell, located approximately 100m to the east. Historic mapping information indicates that there was a ditch system which conveyed flows from the eastern boundary of the site to the River Purwell. However, it would appear that this ditch system has been removed from the land located between the site and the river, with no culvert or alternative drainage system observed to be in place. Therefore, it is proposed to convey flows to an existing tributary of the River Purwell located approximately 90m to the north of the site, which lies within land under the applicant's control.
4. **Public Sewer Network:** as it is possible to dispose of surface water via watercourse, it is not necessary to connect to the public sewer network.

The SuDS design for the site comprises permeable paving and a swale, along with possible water butts for each plot. These are considered to incorporate the 4 pillars of sustainable drainage; water quality, water quantity, biodiversity and amenity benefits.







Flood risk assessment data



Location of site: 518366 / 231513 (shown as easting and northing coordinates)

Document created on: 9 April 2025

This information was previously known as a product 4.

Customer reference number: 94R4KPPE5K2J

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



How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

We recommend that you work with a flood risk consultant to get your flood risk assessment.

Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- past floods
- modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Information that's unavailable

This document **does not** contain:

- flood defences and attributes

We aren't able to display flood defence locations and attributes as there are no formal flood defences in the area of interest.

Surface water and other sources of flooding

When using the surface water map on the [check your long term flood risk service](#) the following considerations apply:

- surface water extents are suitable for use in planning
- surface water climate change scenarios may help to inform risk assessments, but the available data fall short of what is required to assess planned development
- surface water depth information should not be used for planning purposes

To find out about other factors that might affect the flood risk of this location, you should also check:

- [reservoir flood risk](#)
- groundwater flood risk - you could use the [British Geological Survey groundwater flooding data](#), [groundwater: current status and flood risk](#) and the guide on [mining and groundwater constraints for development](#) - further information may be available from the lead local flood authority (LLFA)
- your local planning authority's SFRA, which includes future flood risk

Your Lead Local Flood Authority is Hertfordshire County.

For information about sewer flooding, contact the relevant water company for the area.

About the models used

Model name: EAn_Ivel Project_Ivel Model_2019

Scenario(s): Defended fluvial, defences removed fluvial, defended climate change fluvial, defences removed climate change fluvial

Date: 1 October 2019

Model name: Hiz NHDC SFRA Climate change

Scenario(s): No defences exist fluvial, no defences exist climate change fluvial

Date: 23 October 2008

Model name: Hiz and tributaries outline from NHDC SFRA

Scenario(s): No defences exist fluvial

Date: 1 July 2008

These models contain the most relevant data for your area of interest.

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.

Flood map for planning (rivers and the sea)

Your selected location is in flood zone 2.

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

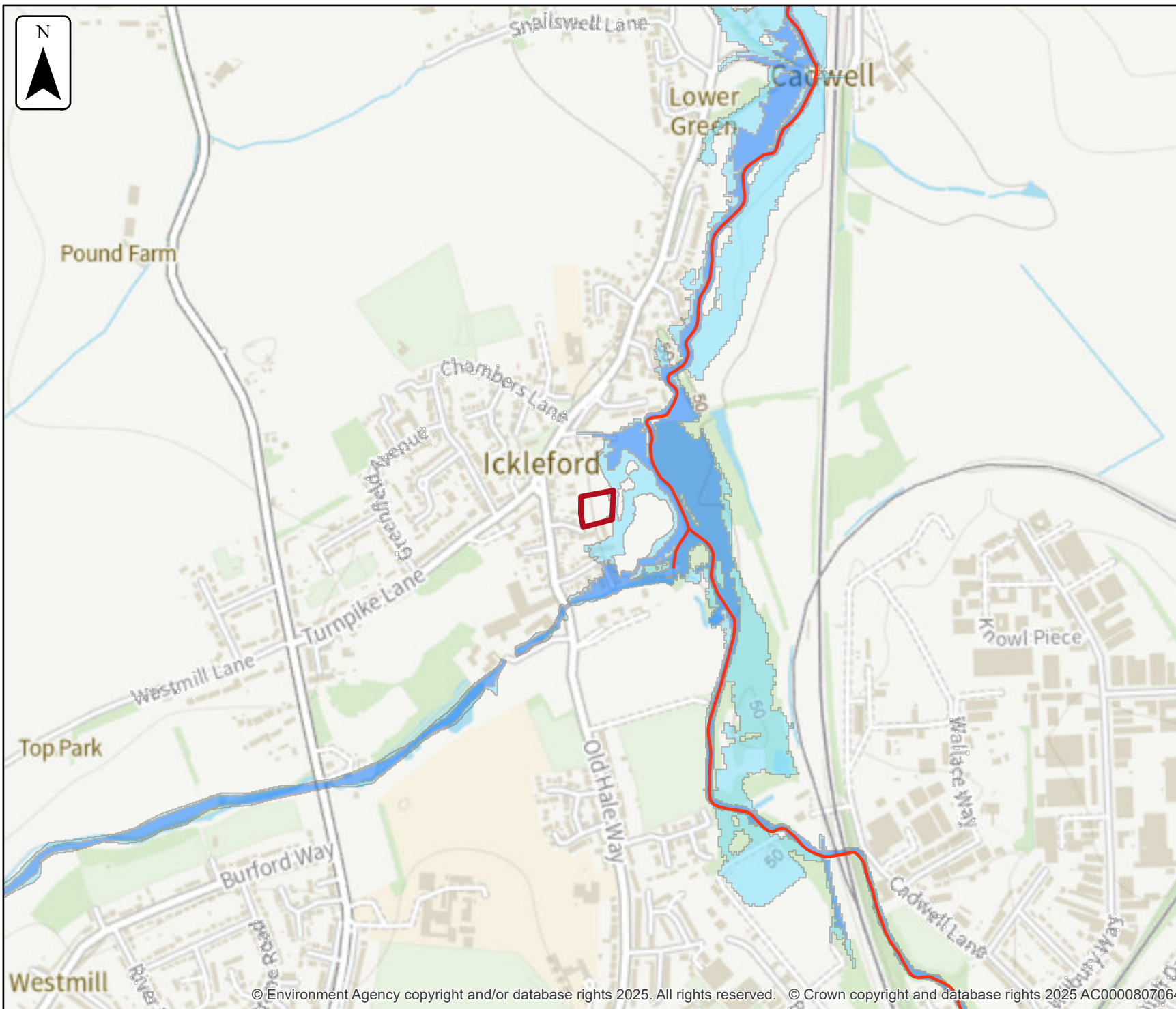
- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

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



Flood map for planning

Location (easting/northing)
518366/231513

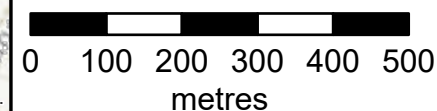
Scale

1:10,000

Created

9 Apr 2025

-  Selected area
-  Main river
-  Flood defence
-  Water storage area
- Flood Zones 2 and 3
Rivers and Sea
-  Flood Zone 2
-  Flood Zone 3



Past floods

Past flood events included in this document

The recorded flood outlines included in this document are for areas of land local to your site location that have been flooded by any of these sources:

- ephemeral water
- main rivers
- ordinary watercourses
- the sea
- unknown

Data limitations

The outlines do not include flooding from:

- drainage where rainfall has led to surface water ponding or overland runoff
- artificial, water-bearing sewer, water supply and wastewater treatment pipelines

Changes to flood defences

The defences (also known as assets) that were in place may also have changed. For example, assets may have been built more recently than the last recorded flood outline.

What the recorded flood outlines dataset is

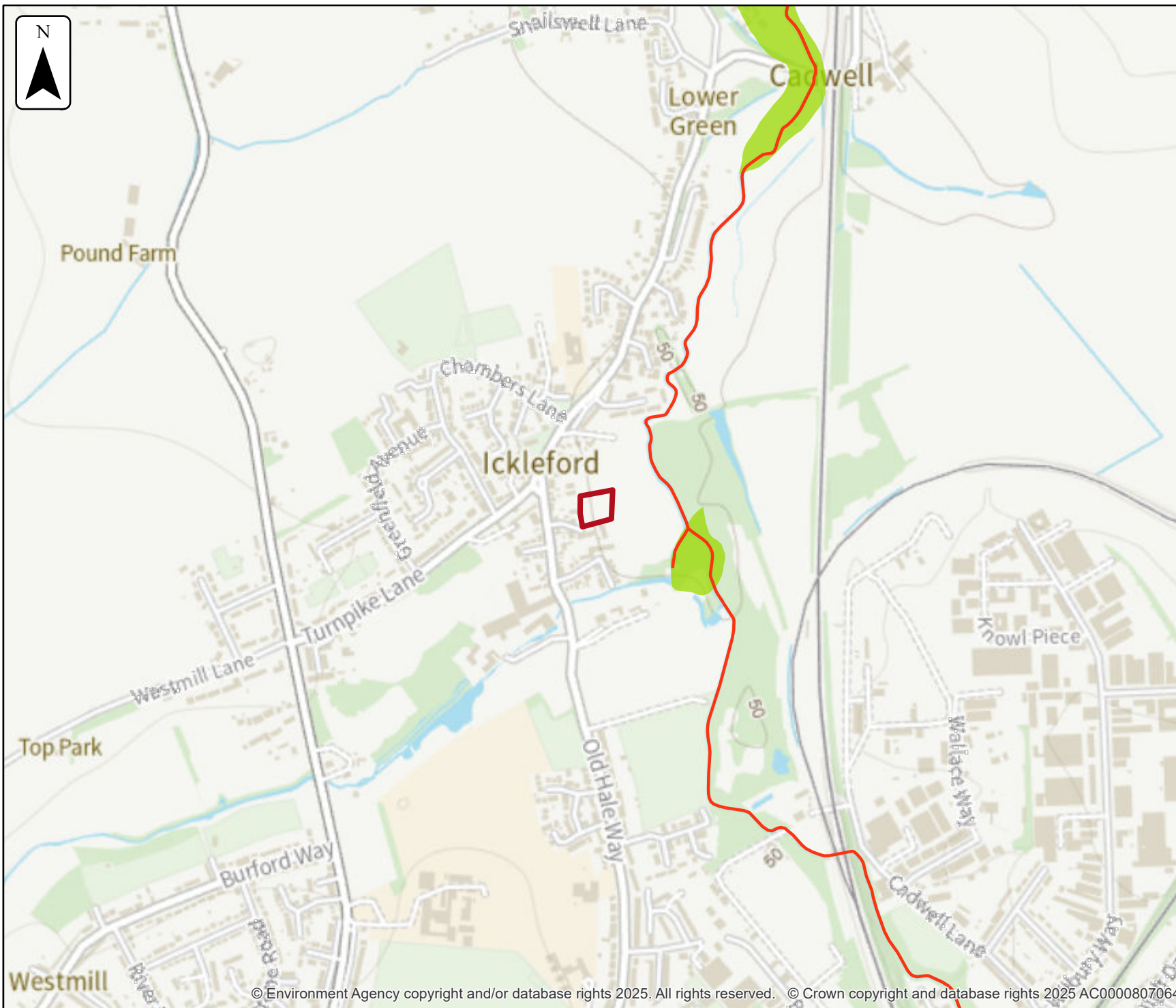
The recorded flood outlines are a geographical information system (GIS) data layer that show our verified records of areas that have flooded in the past from:

- rivers
- the sea
- groundwater
- surface water

[Download the complete recorded flood outlines dataset](#), which includes data quality flags for outlines recorded after April 2020. This indicates the confidence we have in an outline.

Get flood information from other organisations

Contact Hertfordshire County Lead Local Flood Authority (LLFA) and your drainage board to get information about past flooding caused by surface water or drainage systems.



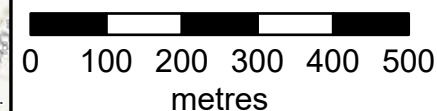
Past floods

Location (easting/northing)
518366/231513

Scale
1:10,000

Created
9 Apr 2025

-  Selected area
-  Main river
- Date of flood event
-  March, 1947



Data on past flood events

Start date	End date	Source of flood	Cause of flood	Affects location
13 March 1947	17 March 1947	main river	channel capacity exceeded (no raised defences)	No

Modelled data

This section provides details of different scenarios we have modelled and includes the following (where available):

- outline maps showing the area at risk from flooding in different modelled scenarios
- modelled node point map(s) showing the points used to get the data to model the scenarios and table(s) providing details of the flood risk for different return periods
- map(s) showing the approximate water levels for the return period with the largest flood extent for a scenario and table(s) of sample points providing details of the flood risk for different return periods

Climate change

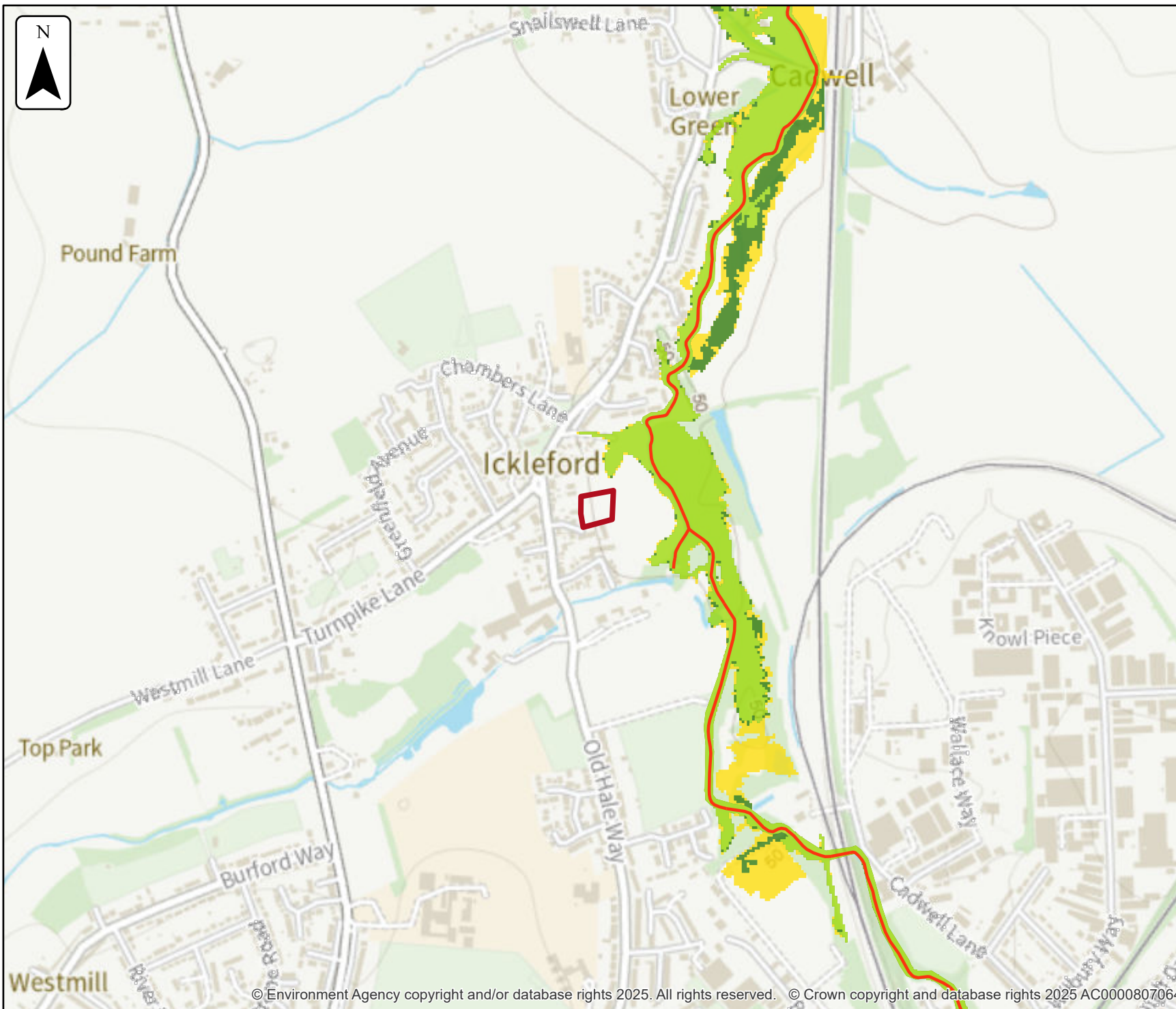
The climate change data included in the models may not include the latest [flood risk assessment climate change allowances](#). Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

The Environment Agency will incorporate the new allowances into future modelling studies. For now, it's your responsibility to demonstrate that new developments will be safe in flood risk terms for their lifetime.

Modelled scenarios

The following scenarios are included:

- Defended modelled fluvial: risk of flooding from rivers where there are flood defences
- Defences removed modelled fluvial: risk of flooding from rivers where flood defences have been removed
- No defences exist modelled fluvial: risk of flooding from rivers where there are no flood defences
- Defended climate change modelled fluvial: risk of flooding from rivers where there are flood defences, including estimated impact of climate change
- Defences removed climate change modelled fluvial: risk of flooding from rivers where flood defences have been removed, including estimated impact of climate change
- No defences exist climate change modelled fluvial: risk of flooding from rivers where there are no flood defences, including estimated impact of climate change



Defences removed climate change modelled fluvial extent

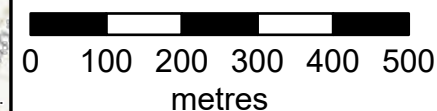
Location (easting/northing)
518366/231513

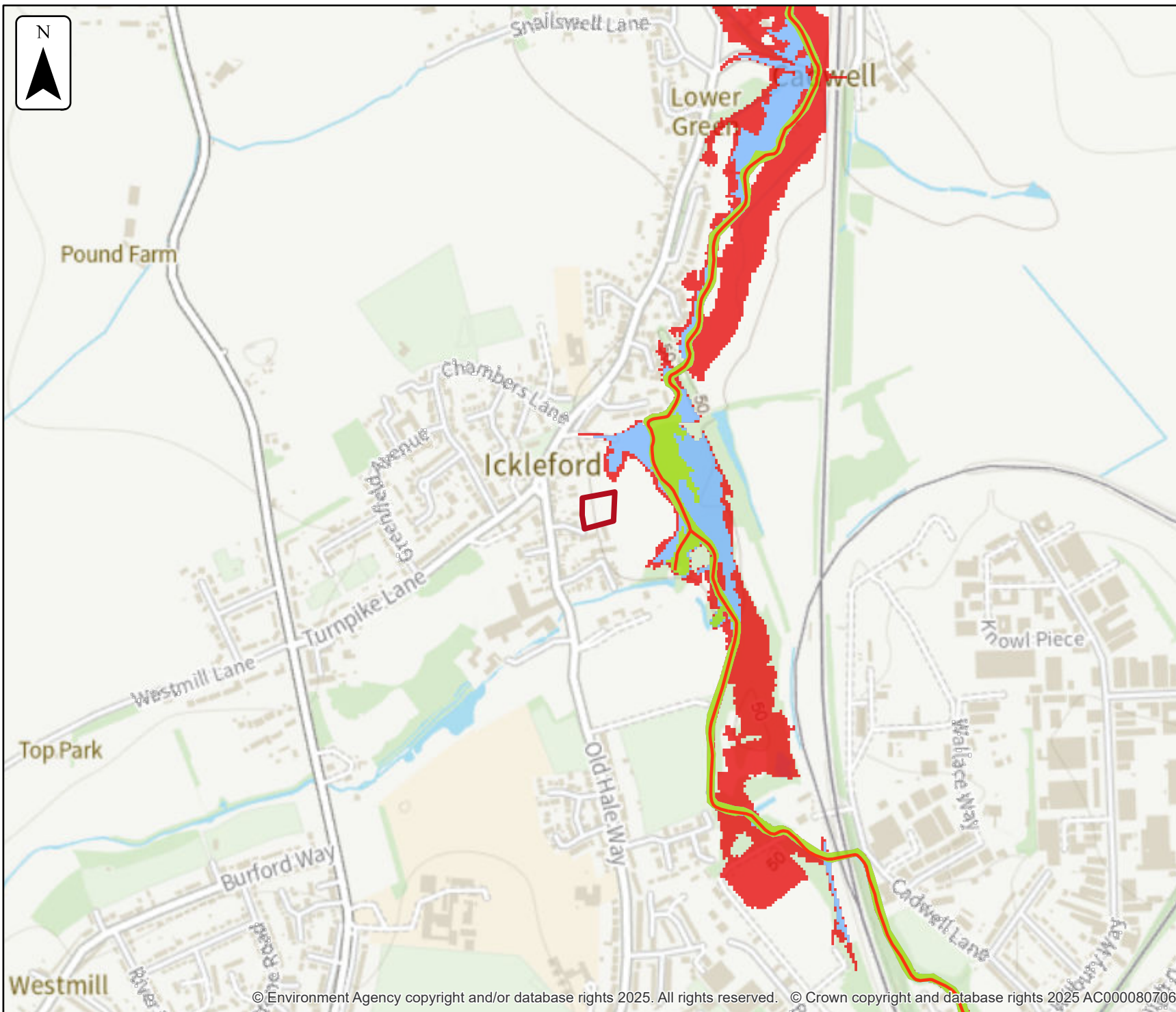
Scale Created
1:10,000 9 Apr 2025

Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Main river
- Modelled flood extent
 -  1% AEP (+25%)
 -  1% AEP (+35%)
 -  1% AEP (+65%)

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





Defences removed modelled fluvial extent

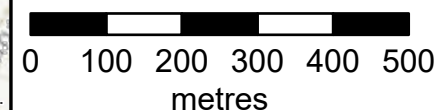
Location (easting/northing)
518366/231513

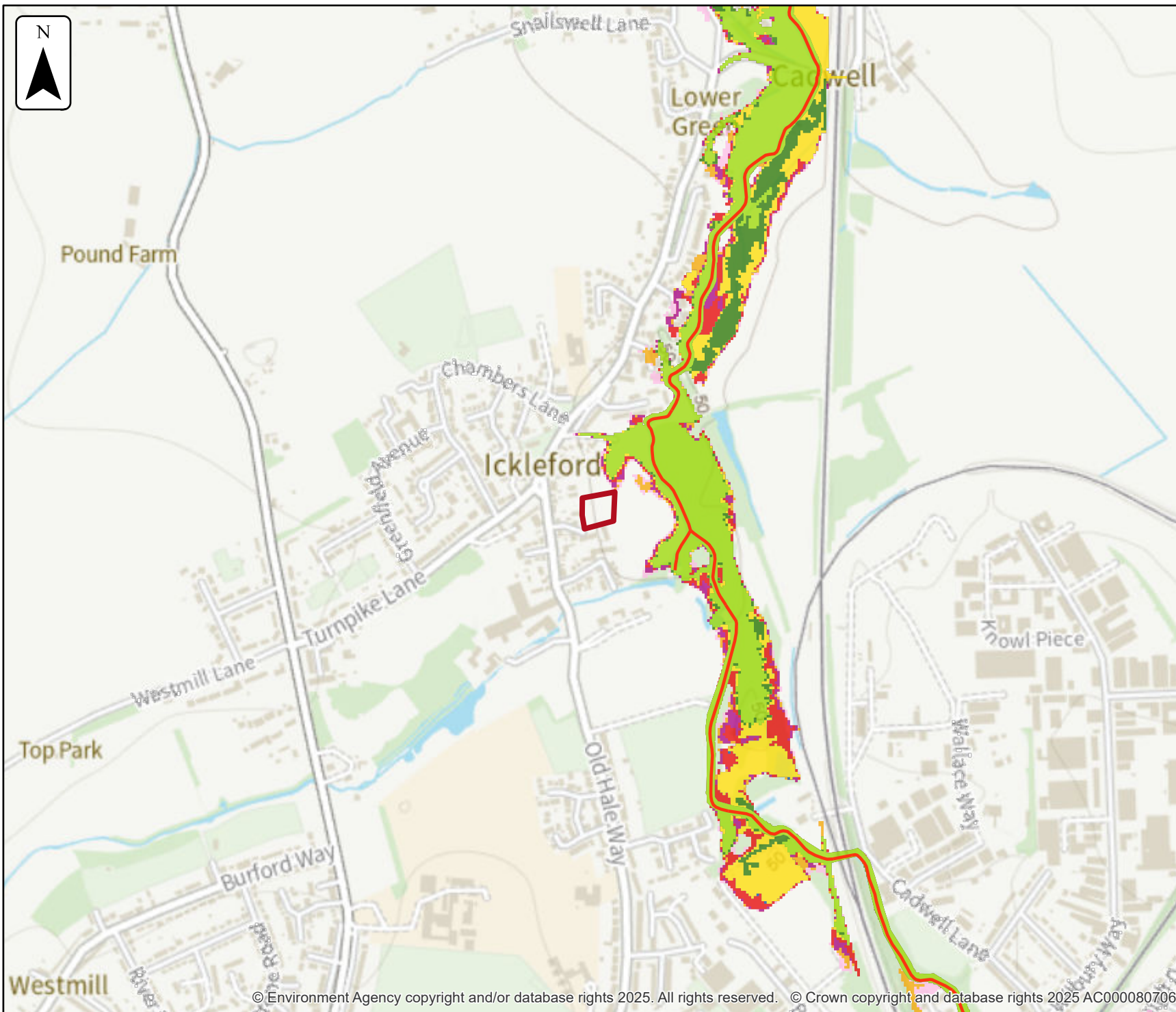
Scale Created
1:10,000 9 Apr 2025

Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Main river
- Modelled flood extent
-  5% AEP
-  1% AEP
-  0.1% AEP

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





Defended climate change modelled fluvial extent

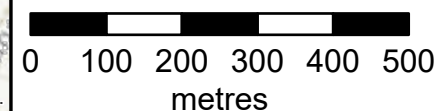
Location (easting/northing)
518366/231513

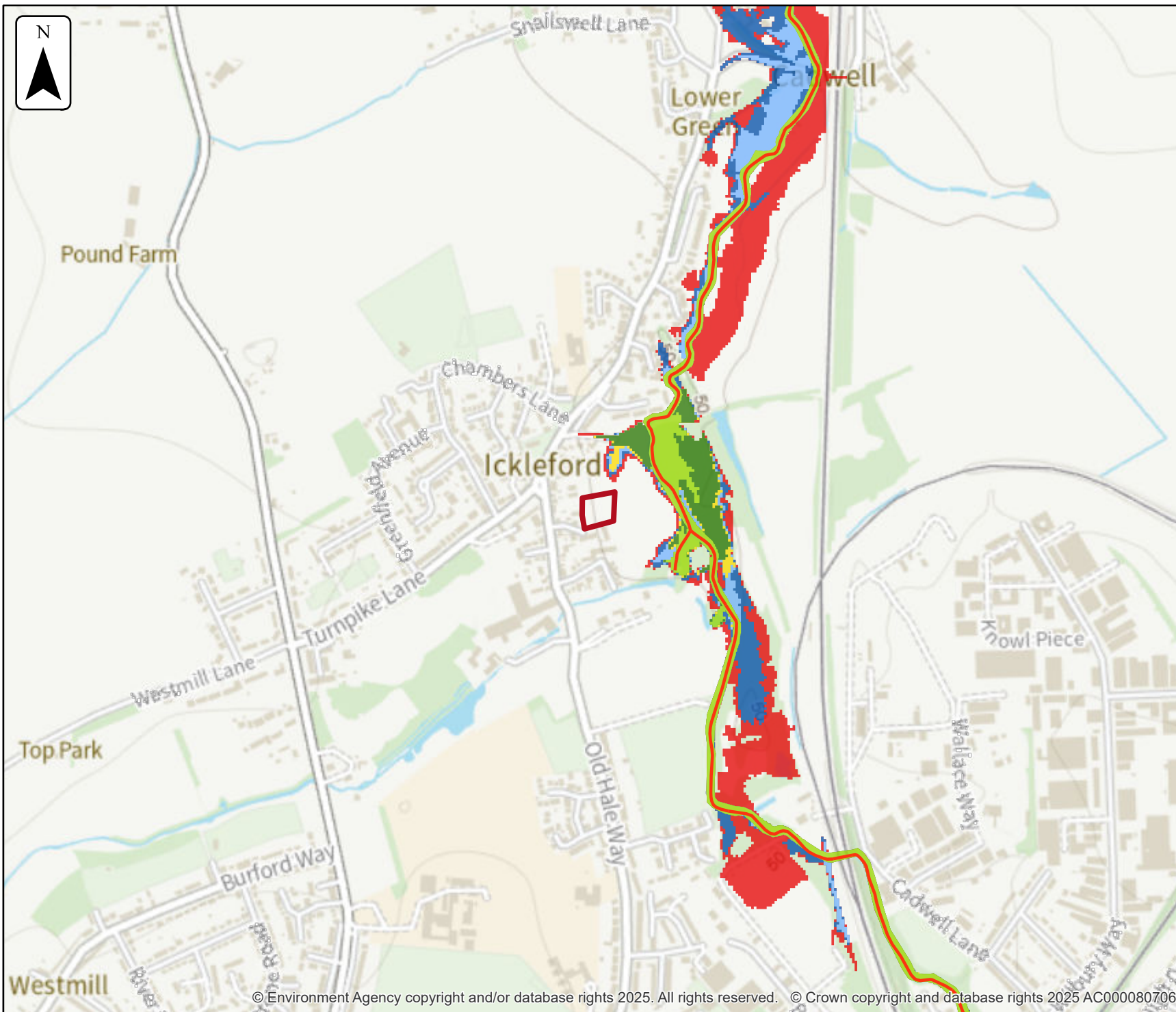
Scale Created
1:10,000 9 Apr 2025

Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Main river
- Modelled flood extent
 -  1% AEP (+25%)
 -  1% AEP (+35%)
 -  1% AEP (+65%)
 -  0.5% AEP (+25%)
 -  0.5% AEP (+35%)
 -  0.5% AEP (+65%)
 -  0.1% AEP (+25%)
 -  0.1% AEP (+35%)
 -  0.1% AEP (+65%)

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





Defended modelled fluvial extent

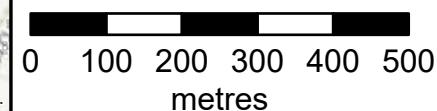
Location (easting/northing)
518366/231513

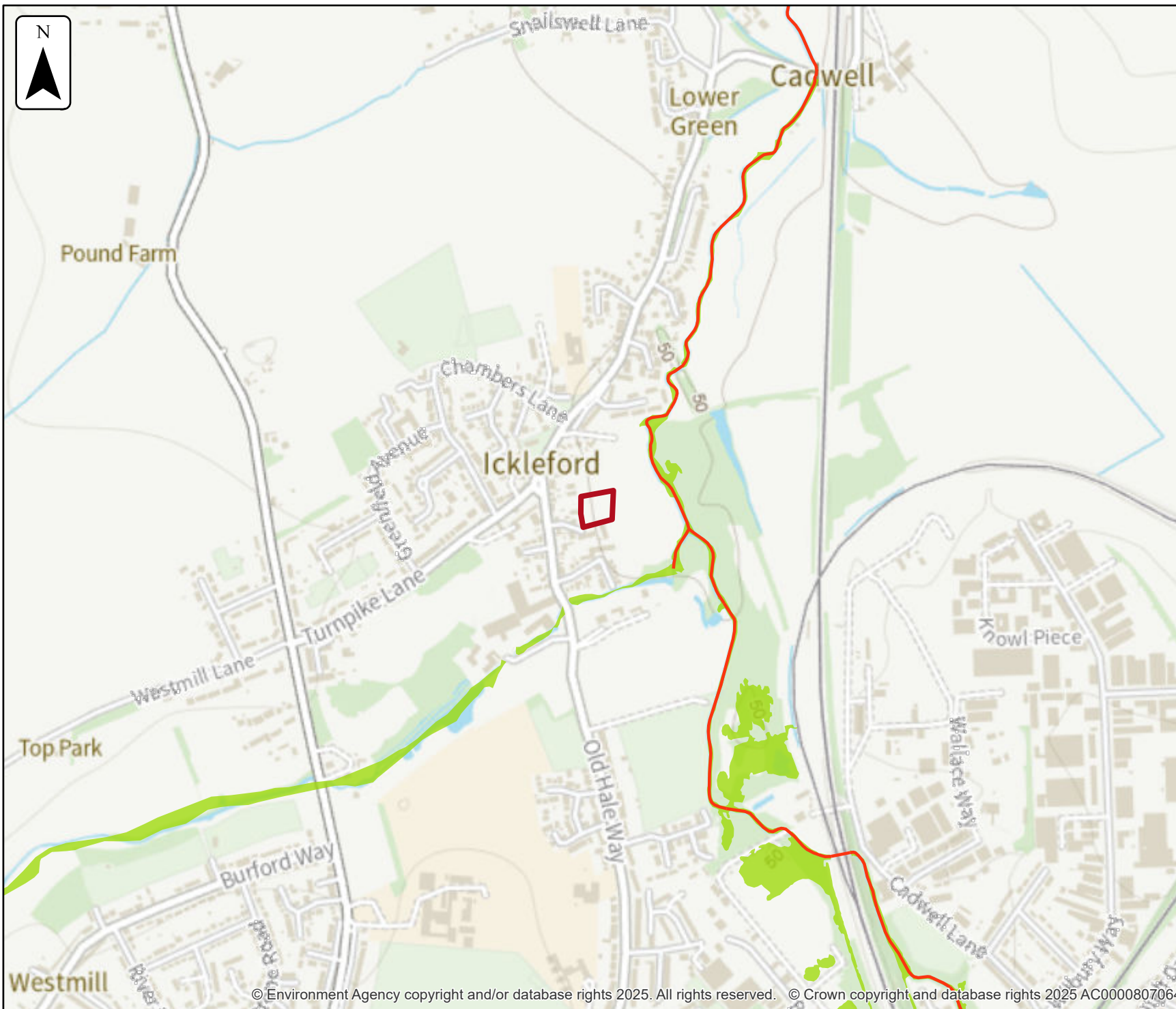
Scale Created
1:10,000 9 Apr 2025

Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Main river
- Modelled flood extent
 -  5% AEP
 -  2% AEP
 -  1.33% AEP
 -  1% AEP
 -  0.5% AEP
 -  0.1% AEP

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





**No defences exist
climate change
modelled fluvial extent**

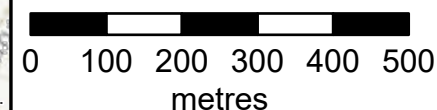
Location (easting/northing)
518366/231513

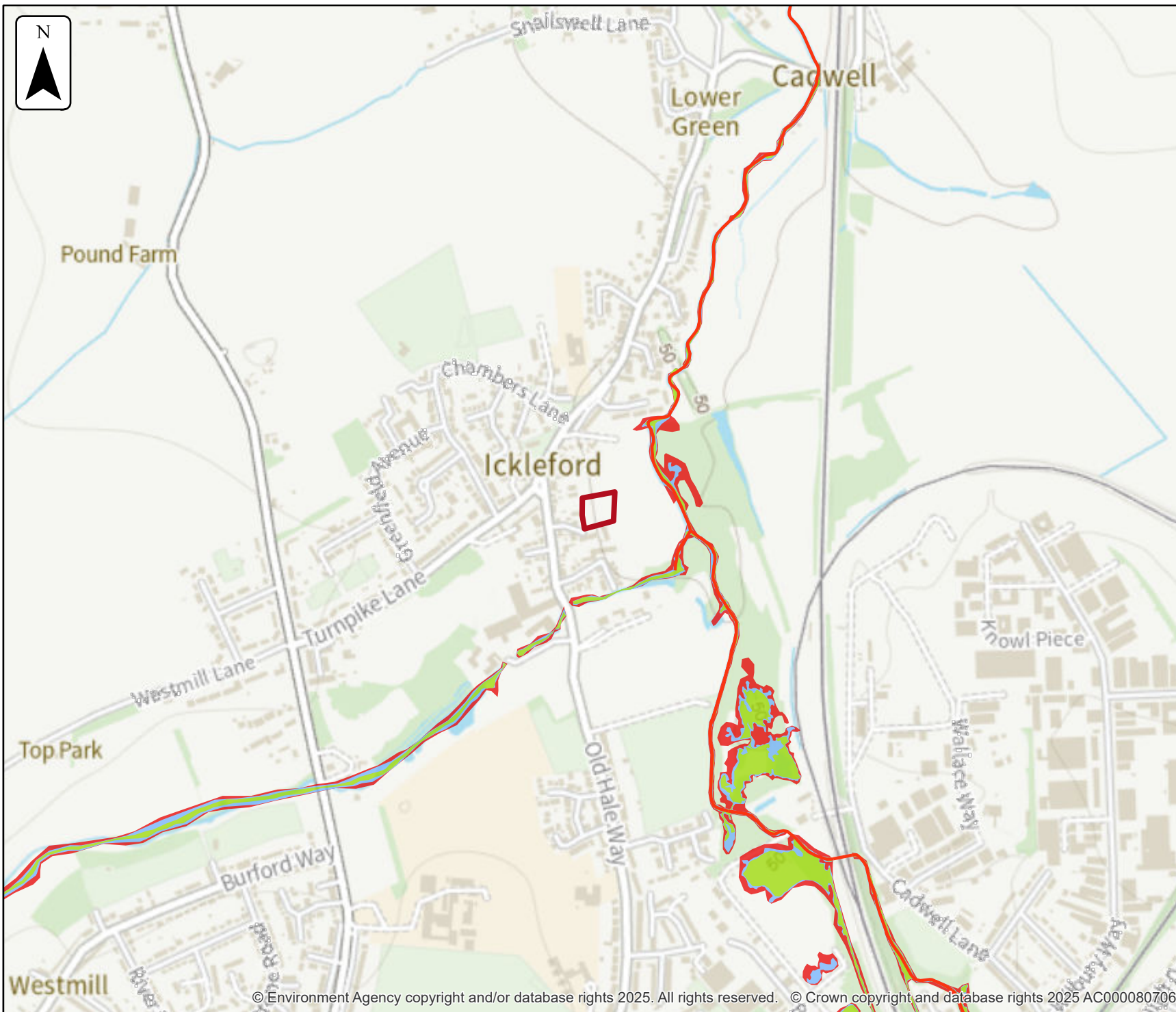
Scale Created
1:10,000 9 Apr 2025

Model name
Hiz NHDC SFRA change

-  Selected area
 Main river
Modelled flood extent
 1% AEP (+20%)

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





No defences exist modelled fluvial extent

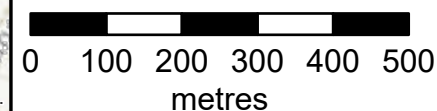
Location (easting/northing)
518366/231513

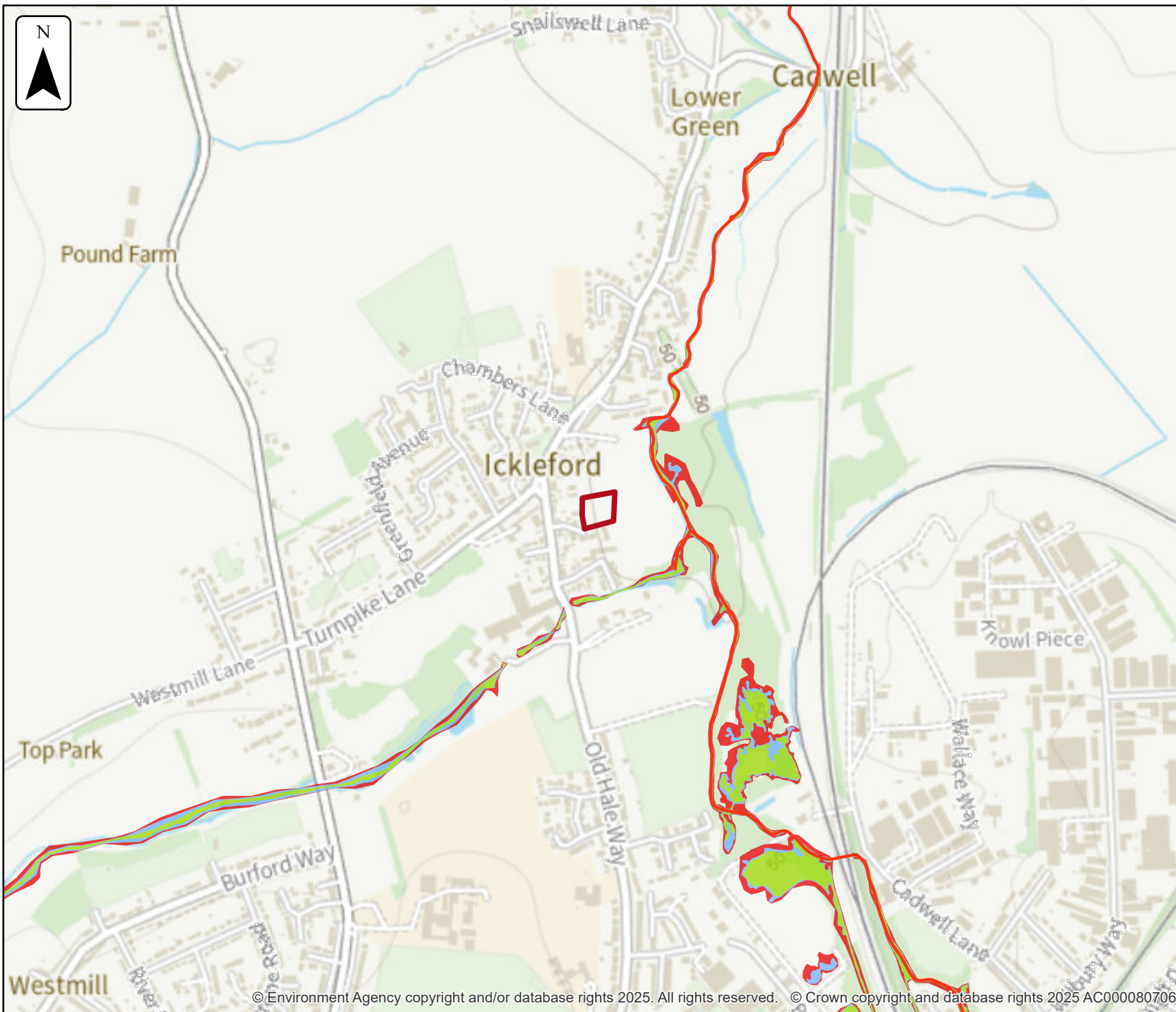
Scale Created
1:10,000 9 Apr 2025

Model name
Hiz NHDC SFRA change

-  Selected area
-  Main river
- Modelled flood extent
 -  5% AEP
 -  1% AEP
 -  0.1% AEP

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





No defences exist modelled fluvial extent

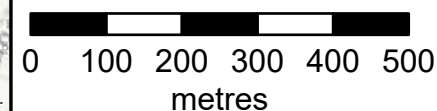
Location (easting/northing)
518366/231513

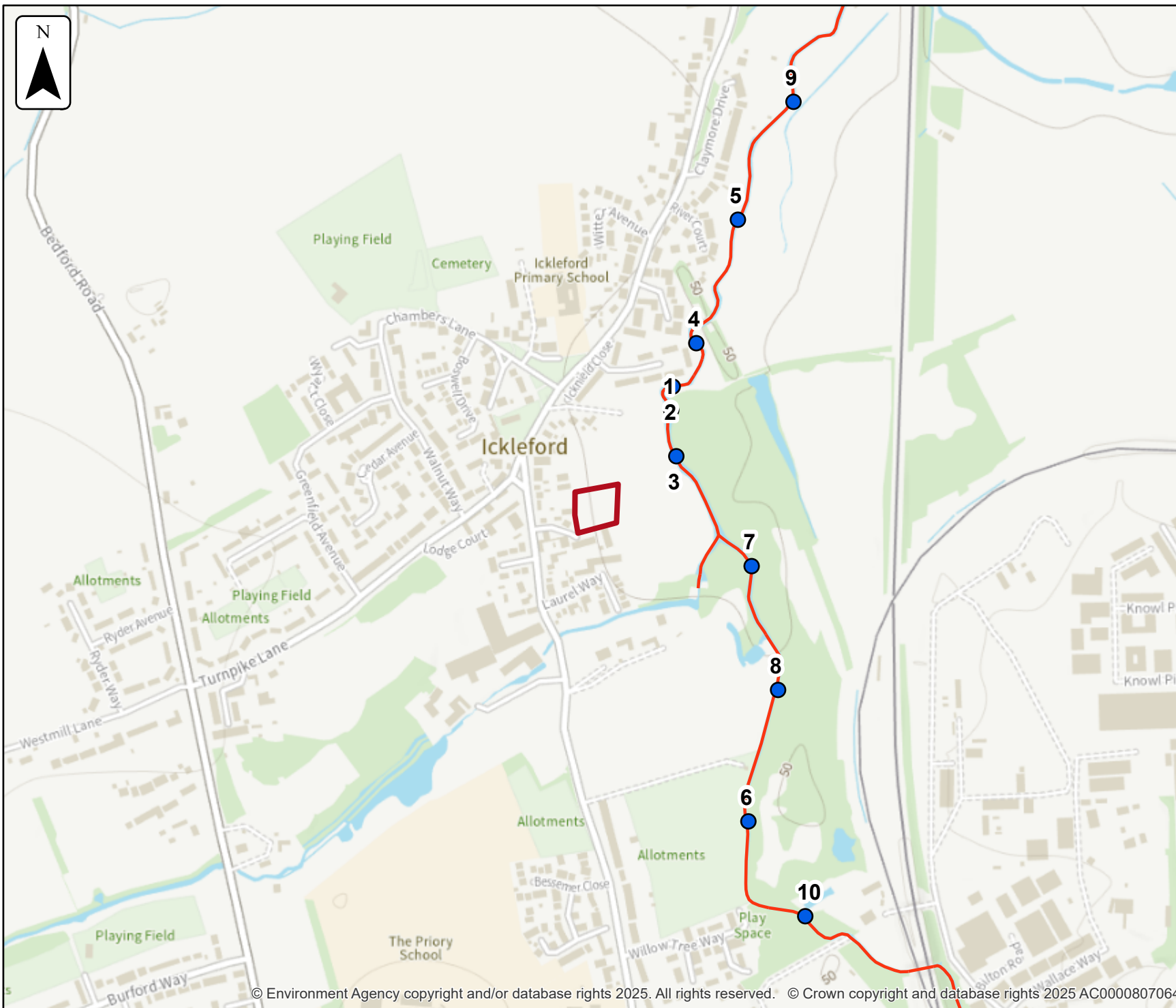
Scale Created
1:10,000 9 Apr 2025

Model name
**Hiz and tributaries
outline from NHDC**

-  Selected area
-  Main river
- Modelled flood extent
 -  5% AEP
 -  1% AEP
 -  0.1% AEP

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





Defences removed climate change modelled fluvial node locations

Location (easting/northing)
518366/231513

Scale Created
1:7,500 9 Apr 2025

Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Modelled location
-  Main river

0 100 200 300
metres

Modelled node locations data

Defences removed climate change

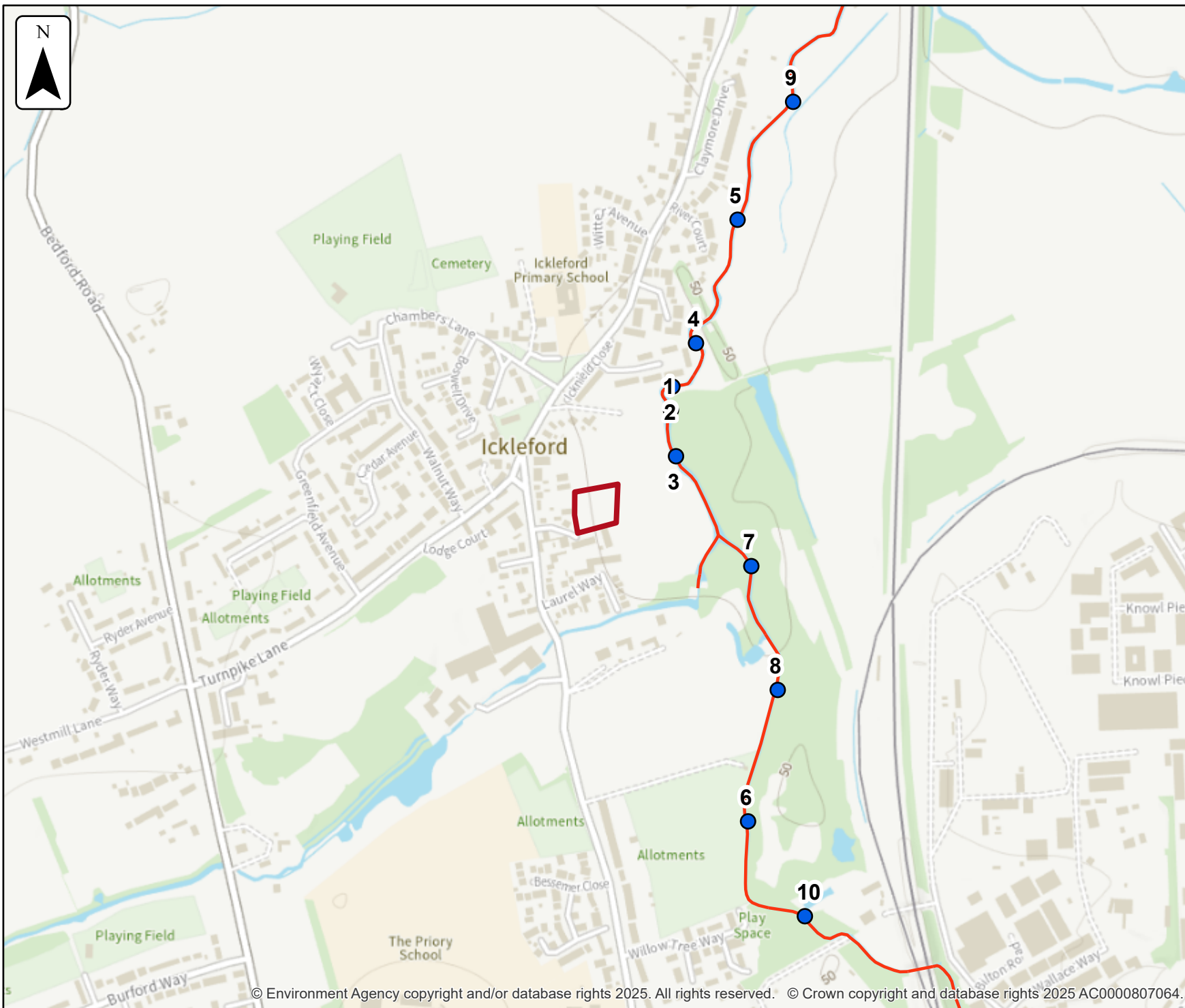
Label	Modelled location ID	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	0.5% AEP (+25%)	0.5% AEP (+35%)	0.5% AEP (+65%)	0.1% AEP (+25%)	0.1% AEP (+35%)	0.1% AEP (+65%)
				Level	Level	Level	Level	Level	Level	Level	Level	Level
1	1364518	518476	231656	49.41	49.44	49.49	49.46	49.49	49.57	49.63	49.66	49.72
2	1364704	518478	231690	49.30	49.32	49.36	49.34	49.36	49.44	49.49	49.52	49.58
3	1364383	518483	231589	49.48	49.50	49.55	49.53	49.55	49.63	49.69	49.72	49.76
4	1364697	518512	231753	49.06	49.09	49.13	49.11	49.13	49.19	49.24	49.27	49.32
5	1364376	518573	231933	48.47	48.51	48.58	48.56	48.58	48.64	48.67	48.69	48.72
6	1364338	518588	231057	50.56	50.60	50.67	50.64	50.67	50.74	50.78	50.79	50.83
7	1364553	518593	231429	49.60	49.62	49.67	49.65	49.67	49.75	49.81	49.84	49.89
8	1364554	518631	231248	49.89	49.92	49.96	49.94	49.96	50.03	50.09	50.12	50.17
9	1364348	518653	232104	47.93	47.96	47.99	47.98	47.99	48.04	48.08	48.10	48.14
10	1364544	518670	230919	51.26	51.30	51.38	51.35	51.38	51.48	51.53	51.56	51.61

Data in this table comes from the EAn lvel Project lvel Model 2019 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.

Defences removed climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	0.5% AEP (+25%)	0.5% AEP (+35%)	0.5% AEP (+65%)	0.1% AEP (+25%)	0.1% AEP (+35%)	0.1% AEP (+65%)
				Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
1	1364518	518476	231656	12.77	13.35	14.57	14.01	14.57	16.85	18.66	19.59	21.20
2	1364704	518478	231690	12.90	13.51	14.80	14.20	14.80	17.21	19.27	20.39	22.58
3	1364383	518483	231589	12.54	13.01	13.87	13.50	13.87	15.12	15.80	16.09	16.59
4	1364697	518512	231753	15.57	16.52	18.12	17.44	18.12	20.30	22.18	23.24	25.34
5	1364376	518573	231933	16.55	17.71	19.75	18.89	19.75	21.91	23.42	24.02	25.24
6	1364338	518588	231057	15.84	16.97	19.19	18.23	19.19	21.95	23.44	24.04	25.35
7	1364553	518593	231429	12.15	12.78	14.03	13.44	14.03	16.06	17.76	18.61	20.39
8	1364554	518631	231248	15.30	16.21	17.88	17.13	17.88	20.53	22.60	23.64	25.76
9	1364348	518653	232104	16.28	17.13	18.19	17.80	18.19	19.63	20.85	21.51	22.88
10	1364544	518670	230919	15.70	16.83	19.02	18.07	19.02	21.77	23.50	24.25	25.96

Data in this table comes from the EAn lvel Project lvel Model 2019 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.



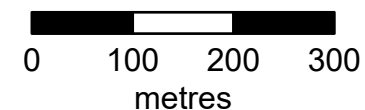
Defences removed modelled fluvial node locations

Location (easting/northing)
518366/231513

Scale Created
1:7,500 9 Apr 2025

Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Modelled location
-  Main river

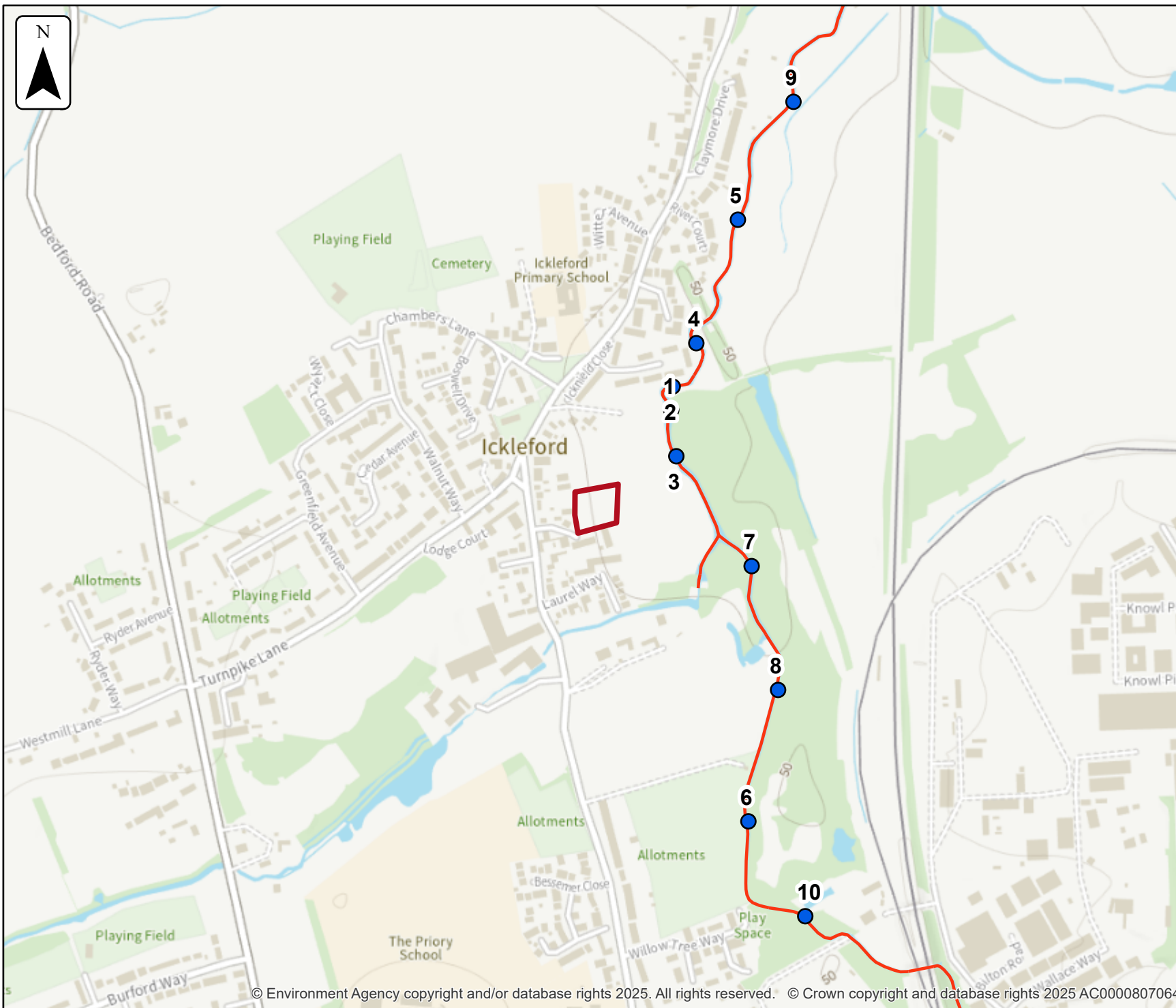


Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	5% AEP	1% AEP	0.1% AEP	5% AEP	1% AEP	0.1% AEP
				Level	Level	Level	Flow	Flow	Flow
1	1364518	518476	231656	49.15	49.33	49.54	8.07	10.96	16.11
2	1364704	518478	231690	49.05	49.22	49.41	8.15	11.06	16.44
3	1364383	518483	231589	49.22	49.40	49.60	8.01	10.85	14.75
4	1364697	518512	231753	48.75	48.98	49.18	8.21	12.89	19.64
5	1364376	518573	231933	48.08	48.33	48.63	8.28	13.03	21.36
6	1364338	518588	231057	50.08	50.39	50.72	7.87	12.39	21.23
7	1364553	518593	231429	49.36	49.51	49.73	8.01	10.34	15.46
8	1364554	518631	231248	49.57	49.78	50.01	7.94	12.43	19.74
9	1364348	518653	232104	47.56	47.83	48.03	8.35	13.11	19.19
10	1364544	518670	230919	50.84	51.09	51.45	7.80	12.28	21.02

Data in this table comes from the EAn Ivel Project Ivel Model 2019 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.



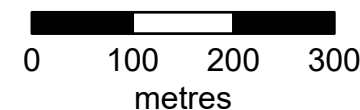
Defended climate change modelled fluvial node locations

Location (easting/northing)
518366/231513

Scale Created
1:7,500 9 Apr 2025

Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

Defended climate change

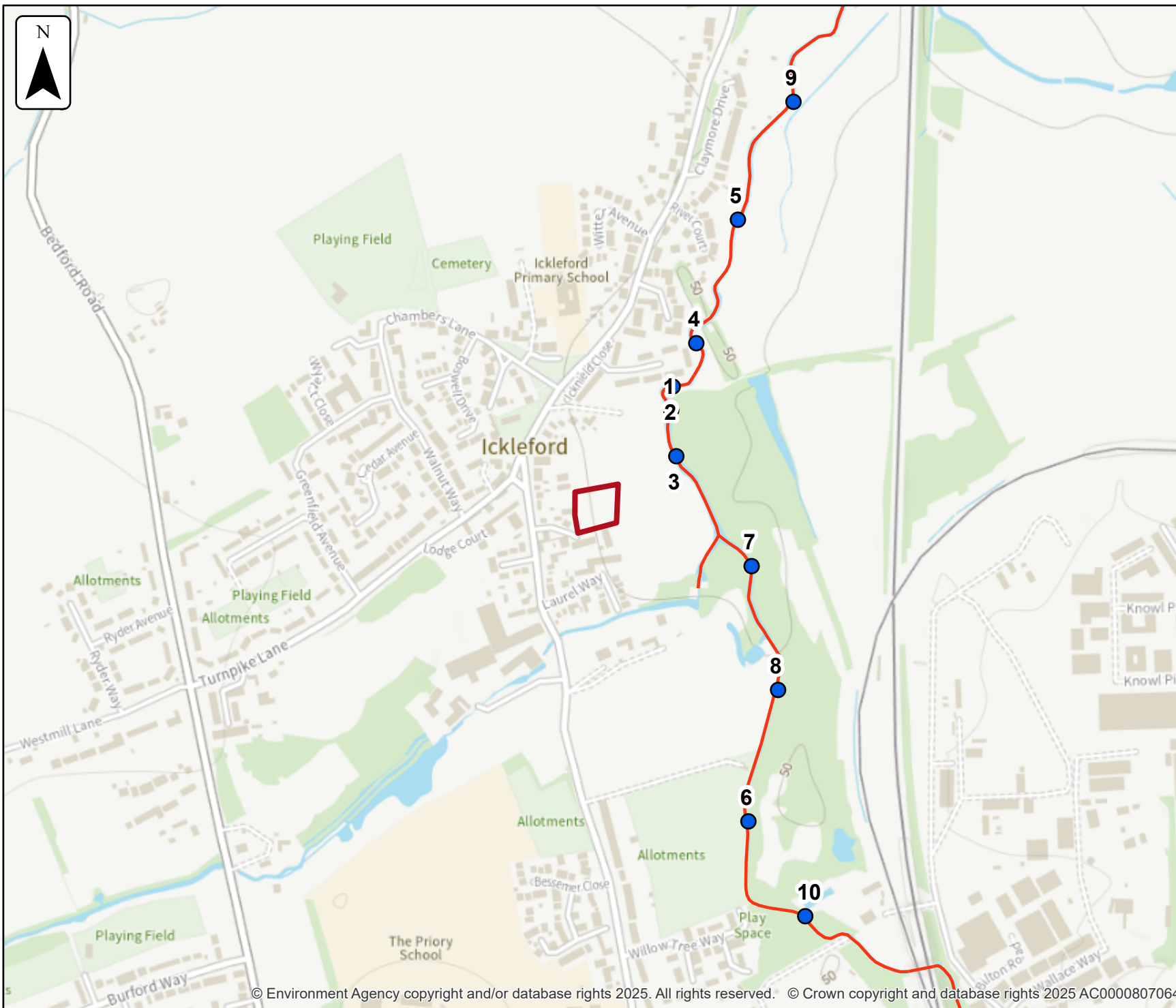
Label	Modelled location ID	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	0.5% AEP (+25%)	0.5% AEP (+35%)	0.5% AEP (+65%)	0.1% AEP (+25%)	0.1% AEP (+35%)	0.1% AEP (+65%)
				Level	Level	Level	Level	Level	Level	Level	Level	Level
1	1364518	518476	231656	49.41	49.44	49.49	49.46	49.49	49.57	49.63	49.66	49.72
2	1364704	518478	231690	49.30	49.32	49.36	49.34	49.36	49.44	49.49	49.52	49.58
3	1364383	518483	231589	49.48	49.50	49.55	49.53	49.55	49.63	49.69	49.72	49.76
4	1364697	518512	231753	49.06	49.09	49.13	49.11	49.13	49.19	49.24	49.27	49.32
5	1364376	518573	231933	48.47	48.51	48.58	48.56	48.58	48.64	48.67	48.69	48.72
6	1364338	518588	231057	50.56	50.60	50.67	50.64	50.67	50.74	50.78	50.79	50.83
7	1364553	518593	231429	49.60	49.62	49.67	49.65	49.67	49.75	49.81	49.84	49.89
8	1364554	518631	231248	49.89	49.92	49.96	49.94	49.96	50.03	50.09	50.12	50.17
9	1364348	518653	232104	47.93	47.96	47.99	47.98	47.99	48.04	48.08	48.10	48.14
10	1364544	518670	230919	51.26	51.30	51.38	51.35	51.38	51.48	51.53	51.56	51.61

Data in this table comes from the EAn lvel Project lvel Model 2019 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.

Defended climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	0.5% AEP (+25%)	0.5% AEP (+35%)	0.5% AEP (+65%)	0.1% AEP (+25%)	0.1% AEP (+35%)	0.1% AEP (+65%)
				Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
1	1364518	518476	231656	12.77	13.35	14.57	14.01	14.57	16.85	18.66	19.59	21.20
2	1364704	518478	231690	12.90	13.51	14.80	14.20	14.80	17.21	19.27	20.39	22.58
3	1364383	518483	231589	12.54	13.01	13.87	13.50	13.87	15.12	15.80	16.09	16.59
4	1364697	518512	231753	15.57	16.52	18.12	17.44	18.12	20.30	22.18	23.24	25.34
5	1364376	518573	231933	16.55	17.71	19.75	18.89	19.75	21.91	23.42	24.02	25.24
6	1364338	518588	231057	15.84	16.97	19.19	18.23	19.19	21.95	23.44	24.04	25.35
7	1364553	518593	231429	12.15	12.78	14.03	13.44	14.03	16.06	17.76	18.61	20.39
8	1364554	518631	231248	15.30	16.21	17.88	17.13	17.88	20.53	22.60	23.64	25.76
9	1364348	518653	232104	16.28	17.13	18.19	17.80	18.19	19.63	20.85	21.51	22.88
10	1364544	518670	230919	15.70	16.83	19.02	18.07	19.02	21.77	23.50	24.25	25.96

Data in this table comes from the EAn lvel Project lvel Model 2019 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.



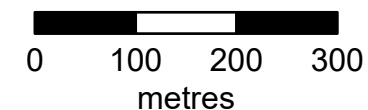
Defended modelled fluvial node locations

Location (easting/northing)
518366/231513

Scale Created
1:7,500 9 Apr 2025

Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

Defended

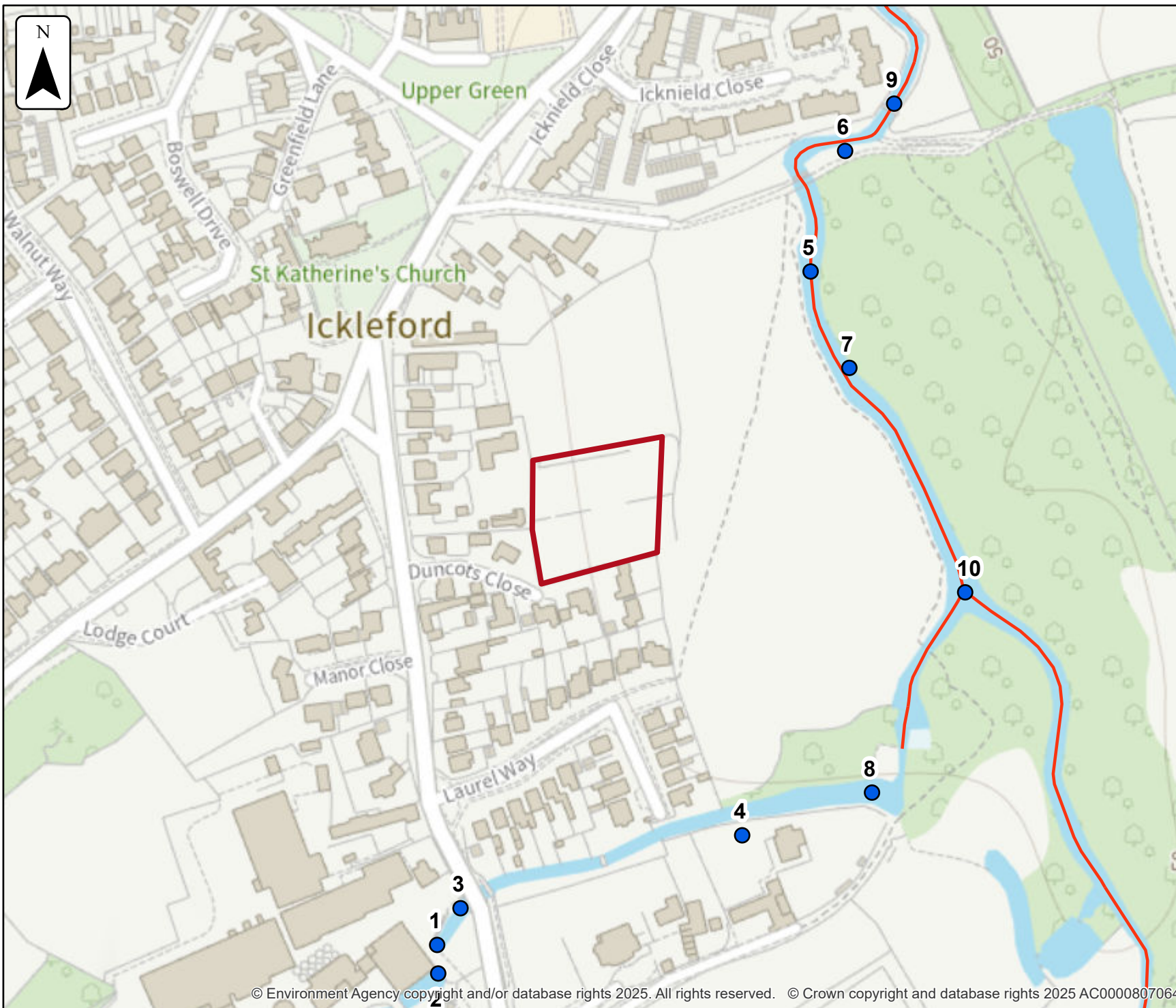
Label	Modelled location ID	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	4% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
1	1364518	518476	231656	48.86	48.99	49.08	49.15	49.17	49.18	49.23	49.27	49.33	49.40	49.54
2	1364704	518478	231690	48.77	48.89	48.98	49.05	49.06	49.08	49.12	49.16	49.22	49.29	49.41
3	1364383	518483	231589	48.93	49.06	49.15	49.22	49.24	49.25	49.29	49.34	49.40	49.47	49.60
4	1364697	518512	231753	48.50	48.61	48.69	48.75	48.77	48.79	48.84	48.90	48.98	49.05	49.18
5	1364376	518573	231933	47.81	47.92	48.01	48.08	48.09	48.11	48.17	48.23	48.33	48.45	48.63
6	1364338	518588	231057	49.74	49.89	49.99	50.08	50.12	50.14	50.20	50.27	50.39	50.54	50.72
7	1364553	518593	231429	49.06	49.20	49.28	49.36	49.38	49.39	49.43	49.47	49.51	49.59	49.73
8	1364554	518631	231248	49.25	49.39	49.49	49.57	49.60	49.62	49.66	49.71	49.78	49.88	50.01
9	1364348	518653	232104	47.27	47.40	47.48	47.56	47.58	47.60	47.66	47.73	47.83	47.92	48.03
10	1364544	518670	230919	50.54	50.67	50.76	50.84	50.87	50.89	50.93	50.99	51.09	51.24	51.45

Data in this table comes from the EAn Ivel Project Ivel Model 2019 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.

Defended

Label	Modelled location ID	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	4% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
1	1364518	518476	231656	4.35	5.84	7.0	8.07	8.35	8.58	9.20	9.91	10.96	12.54	16.11
2	1364704	518478	231690	4.38	5.89	7.06	8.15	8.42	8.66	9.29	10.01	11.06	12.67	16.44
3	1364383	518483	231589	4.31	5.79	6.95	8.01	8.28	8.50	9.12	9.82	10.85	12.35	14.75
4	1364697	518512	231753	4.42	5.93	7.12	8.21	8.50	8.84	9.79	10.98	12.89	15.21	19.64
5	1364376	518573	231933	4.45	5.98	7.18	8.28	8.57	8.91	9.88	11.07	13.03	16.09	21.36
6	1364338	518588	231057	4.22	5.66	6.80	7.87	8.29	8.64	9.40	10.48	12.39	15.37	21.23
7	1364553	518593	231429	4.28	5.75	6.89	8.01	8.41	8.75	9.26	9.62	10.34	11.94	15.46
8	1364554	518631	231248	4.25	5.71	6.85	7.94	8.36	8.72	9.48	10.57	12.43	14.94	19.74
9	1364348	518653	232104	4.48	6.03	7.23	8.35	8.64	8.99	9.96	11.17	13.11	15.89	19.19
10	1364544	518670	230919	4.18	5.62	6.74	7.80	8.21	8.57	9.31	10.39	12.28	15.24	21.02

Data in this table comes from the EAn Ivel Project Ivel Model 2019 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.



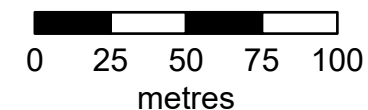
**No defences exist
climate change
modelled fluvial
node locations**

Location (easting/northing)
518366/231513

Scale Created
1:2,500 9 Apr 2025

Model name
Hiz NHDC SFRA change

- Selected area
- Modelled location
- Main river

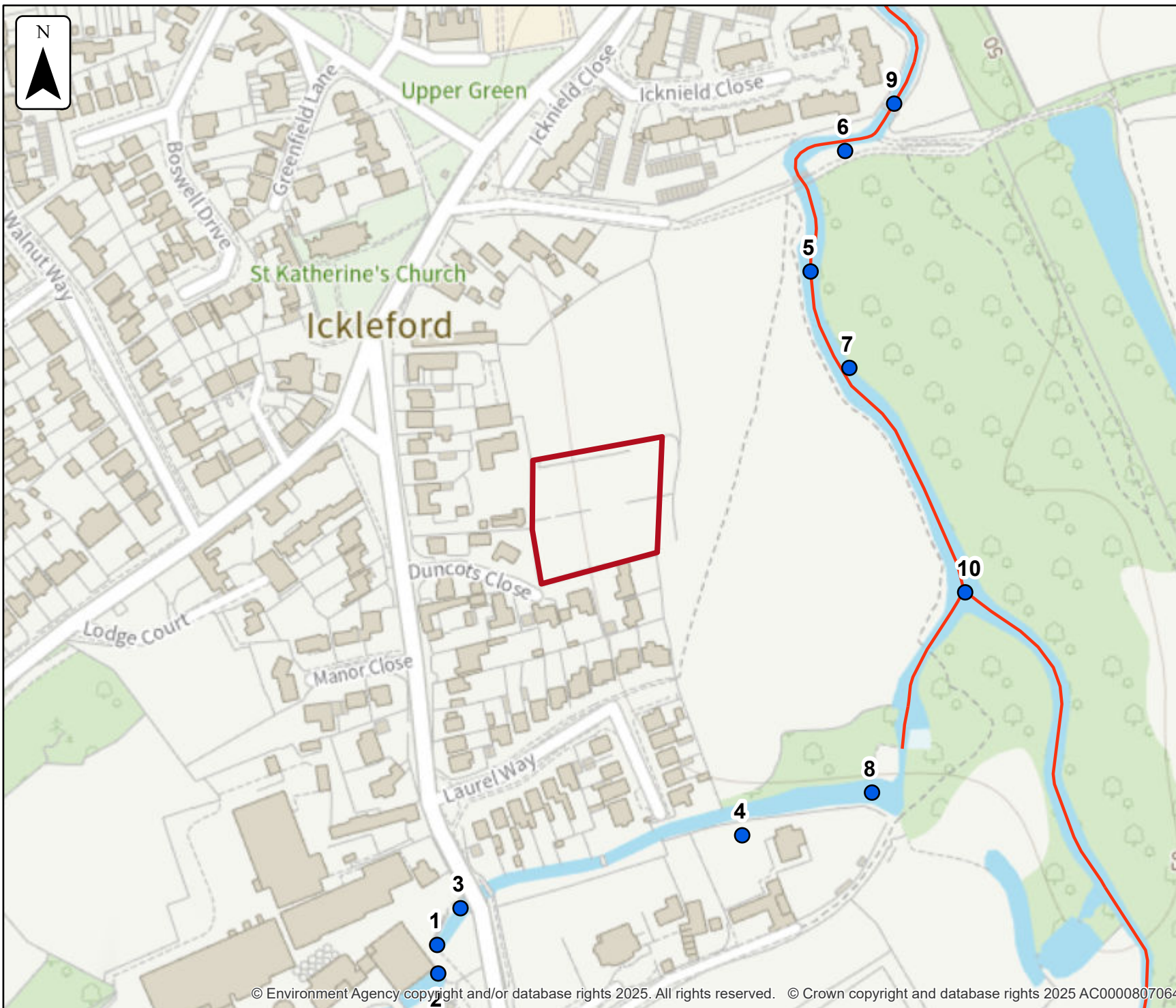


Modelled node locations data

No defences exist climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+20%)
				Level
1	1503392	518289	231301	50.87
2	1503473	518290	231288	51.53
3	1503420	518301	231319	50.76
4	1503531	518437	231355	49.67
5	1503395	518470	231628	48.66
6	1503465	518487	231687	48.64
7	1503404	518489	231581	48.98
8	1503396	518500	231375	48.98
9	1503439	518511	231710	48.05
10	1503413	518545	231472	48.98

Data in this table comes from the Hiz NHDC SFRA Climate change 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.



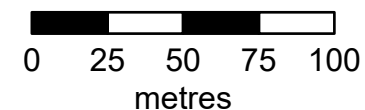
No defences exist modelled fluvial node locations

Location (easting/northing)
518366/231513

Scale Created
1:2,500 9 Apr 2025

Model name
Hiz NHDC SFRA change

-  Selected area
-  Modelled location
-  Main river

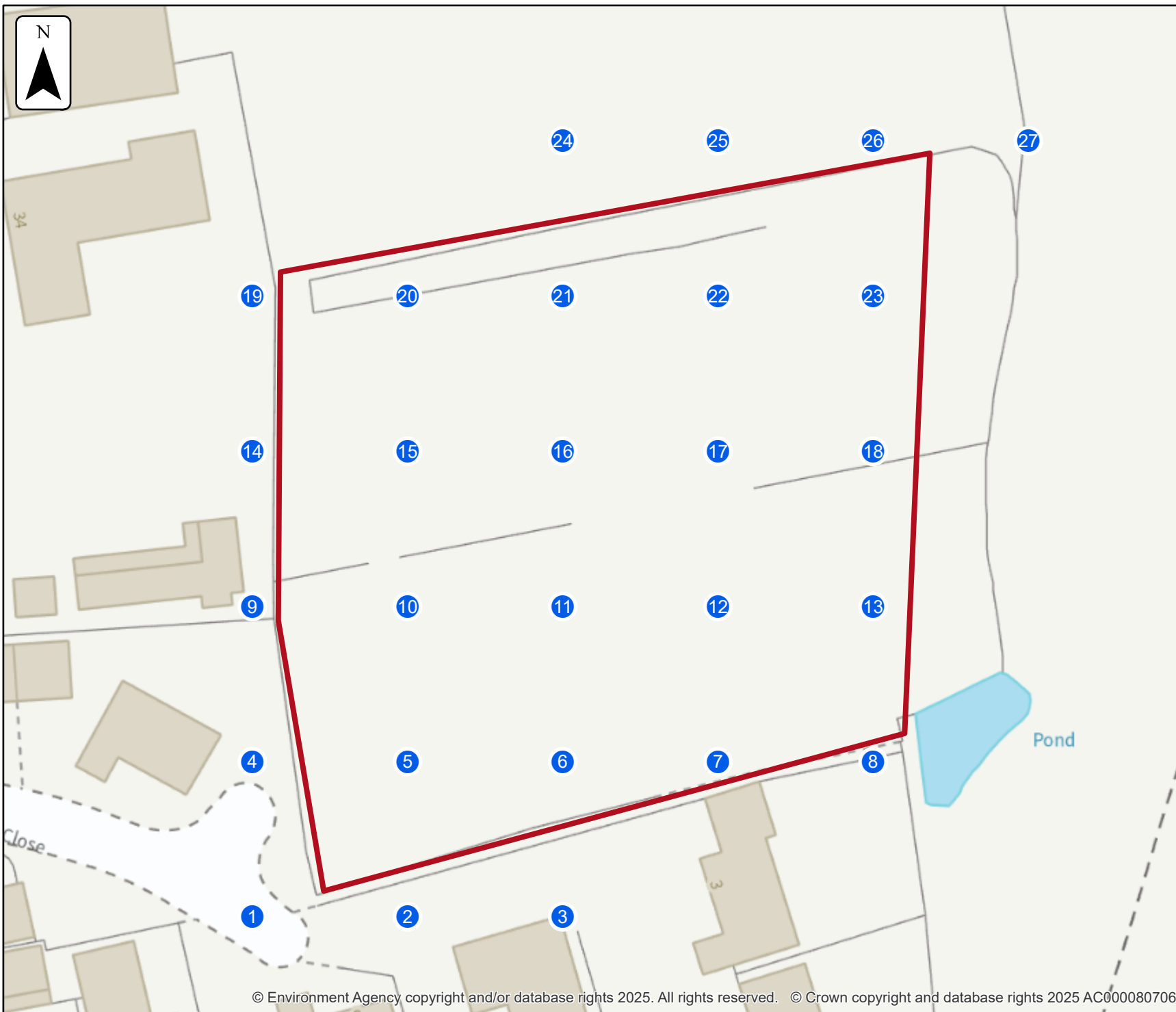


Modelled node locations data

No defences exist

Label	Modelled location ID	Easting	Northing	5% AEP	1% AEP	0.1% AEP
				Level	Level	Level
1	1503392	518289	231301	50.76	50.85	51.08
2	1503473	518290	231288	51.47	51.52	51.66
3	1503420	518301	231319	50.64	50.73	50.99
4	1503531	518437	231355	49.56	49.65	49.86
5	1503395	518470	231628	48.56	48.63	48.80
6	1503465	518487	231687	48.55	48.62	48.77
7	1503404	518489	231581	48.86	48.94	49.13
8	1503396	518500	231375	48.86	48.94	49.13
9	1503439	518511	231710	47.94	48.02	48.20
10	1503413	518545	231472	48.86	48.94	49.13

Data in this table comes from the Hiz NHDC SFRA Climate change 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.



Defended modelled fluvial extent and height

Location (easting/northing)
518366/231513

Scale Created
1:500 9 Apr 2025

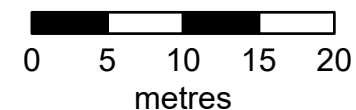
Model name
**EAn Ivel Project
Model 2019**

- Selected area
- Main river

Modelled 2D grid
Water level in mAOD

- 0 - 49.0
- 49.0 - 49.25
- 49.25 - 49.5
- 49.5 - 49.75
- 49.75 - 50.0
- 50.0 - 50.25
- 50.25 - 50.5
- 50.5 - 50.75
- 50.75 - 51.0

This map shows the
0.1% AEP height data



Sample point data

Defended

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	4% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
1	518333	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
2	518348	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	518363	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
4	518333	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	518348	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	518363	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
7	518378	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
8	518393	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
9	518333	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	518348	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	518363	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	518378	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	4% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
13	518393	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
14	518333	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	518348	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	518363	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
17	518378	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	518393	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
19	518333	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
20	518348	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	518363	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	518378	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	518393	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
24	518363	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	4% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
25	518378	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	518393	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
27	518408	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Data in this table comes from the EAn Ivel Project Ivel Model 2019 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.

'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

Defended

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	4% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height	Height	Height	Height
1	518333	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
2	518348	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	518363	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
4	518333	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	518348	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	518363	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
7	518378	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
8	518393	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
9	518333	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	518348	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	518363	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	518378	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	4% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height	Height	Height	Height
13	518393	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
14	518333	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	518348	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	518363	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
17	518378	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	518393	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
19	518333	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
20	518348	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	518363	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	518378	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	518393	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
24	518363	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

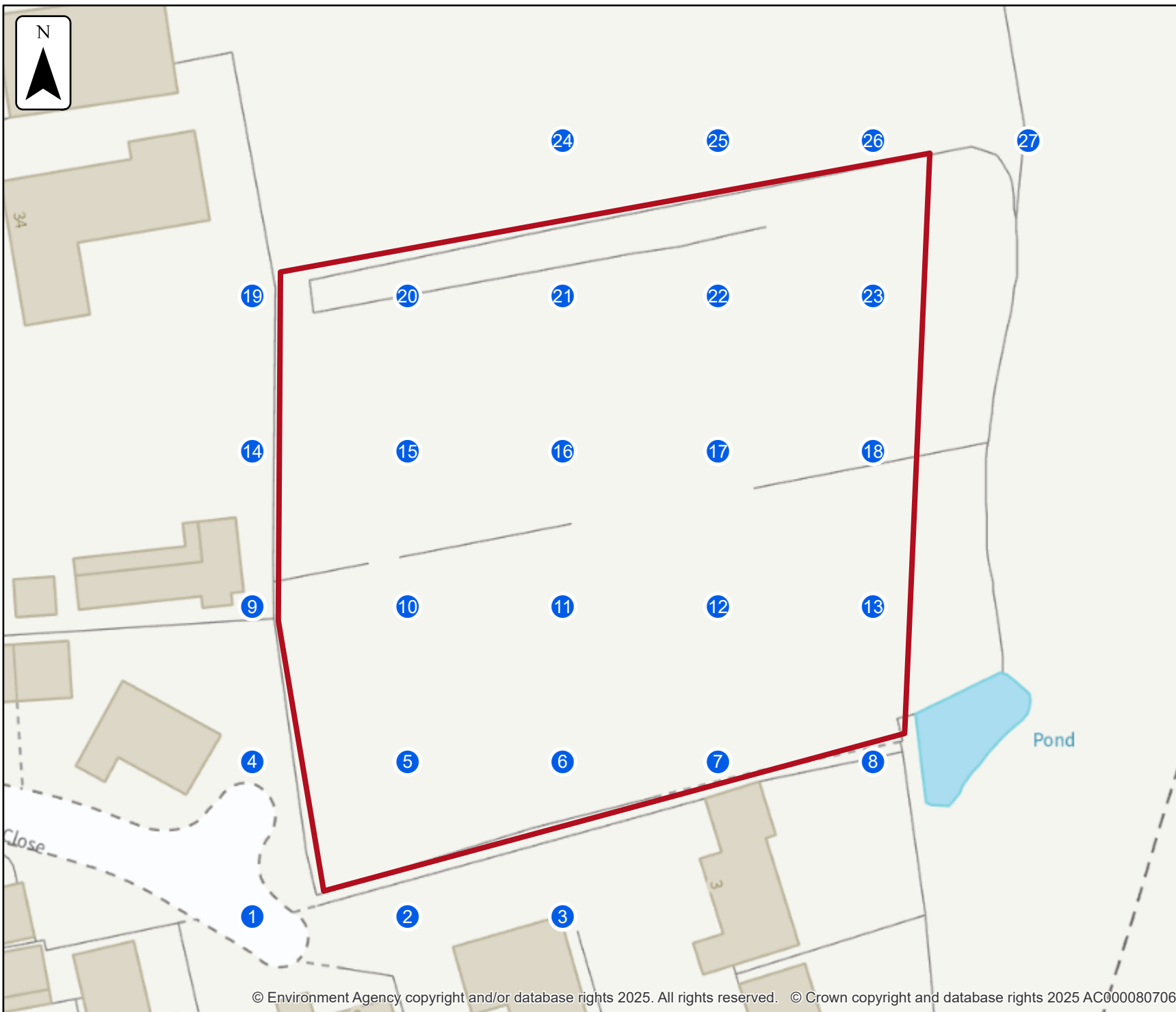
Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	4% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height	Height	Height	Height
25	518378	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	518393	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
27	518408	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Data in this table comes from the EAn Ivel Project Ivel Model 2019 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.

'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.



Defences removed modelled fluvial extent and height

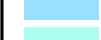
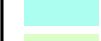
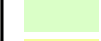
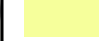
Location (easting/northing)
518366/231513

Scale Created
1:500 9 Apr 2025

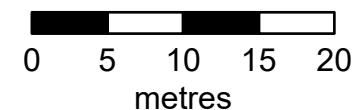
Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Main river

Modelled 2D grid
Water level in mAOD

-  0 - 49.0
-  49.0 - 49.25
-  49.25 - 49.5
-  49.5 - 49.75
-  49.75 - 50.0
-  50.0 - 50.25
-  50.25 - 50.5
-  50.5 - 50.75
-  50.75 - 51.0

This map shows the
0.1% AEP height data



Sample point data

Defences removed

Label	Easting	Northing	5% AEP	1% AEP	0.1% AEP	5% AEP	1% AEP	0.1% AEP
			Depth	Depth	Depth	Height	Height	Height
1	518333	231474	NoData	NoData	NoData	NoData	NoData	NoData
2	518348	231474	NoData	NoData	NoData	NoData	NoData	NoData
3	518363	231474	NoData	NoData	NoData	NoData	NoData	NoData
4	518333	231489	NoData	NoData	NoData	NoData	NoData	NoData
5	518348	231489	NoData	NoData	NoData	NoData	NoData	NoData
6	518363	231489	NoData	NoData	NoData	NoData	NoData	NoData
7	518378	231489	NoData	NoData	NoData	NoData	NoData	NoData
8	518393	231489	NoData	NoData	NoData	NoData	NoData	NoData
9	518333	231504	NoData	NoData	NoData	NoData	NoData	NoData
10	518348	231504	NoData	NoData	NoData	NoData	NoData	NoData
11	518363	231504	NoData	NoData	NoData	NoData	NoData	NoData
12	518378	231504	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	5% AEP	1% AEP	0.1% AEP	5% AEP	1% AEP	0.1% AEP
			Depth	Depth	Depth	Height	Height	Height
13	518393	231504	NoData	NoData	NoData	NoData	NoData	NoData
14	518333	231519	NoData	NoData	NoData	NoData	NoData	NoData
15	518348	231519	NoData	NoData	NoData	NoData	NoData	NoData
16	518363	231519	NoData	NoData	NoData	NoData	NoData	NoData
17	518378	231519	NoData	NoData	NoData	NoData	NoData	NoData
18	518393	231519	NoData	NoData	NoData	NoData	NoData	NoData
19	518333	231534	NoData	NoData	NoData	NoData	NoData	NoData
20	518348	231534	NoData	NoData	NoData	NoData	NoData	NoData
21	518363	231534	NoData	NoData	NoData	NoData	NoData	NoData
22	518378	231534	NoData	NoData	NoData	NoData	NoData	NoData
23	518393	231534	NoData	NoData	NoData	NoData	NoData	NoData
24	518363	231549	NoData	NoData	NoData	NoData	NoData	NoData

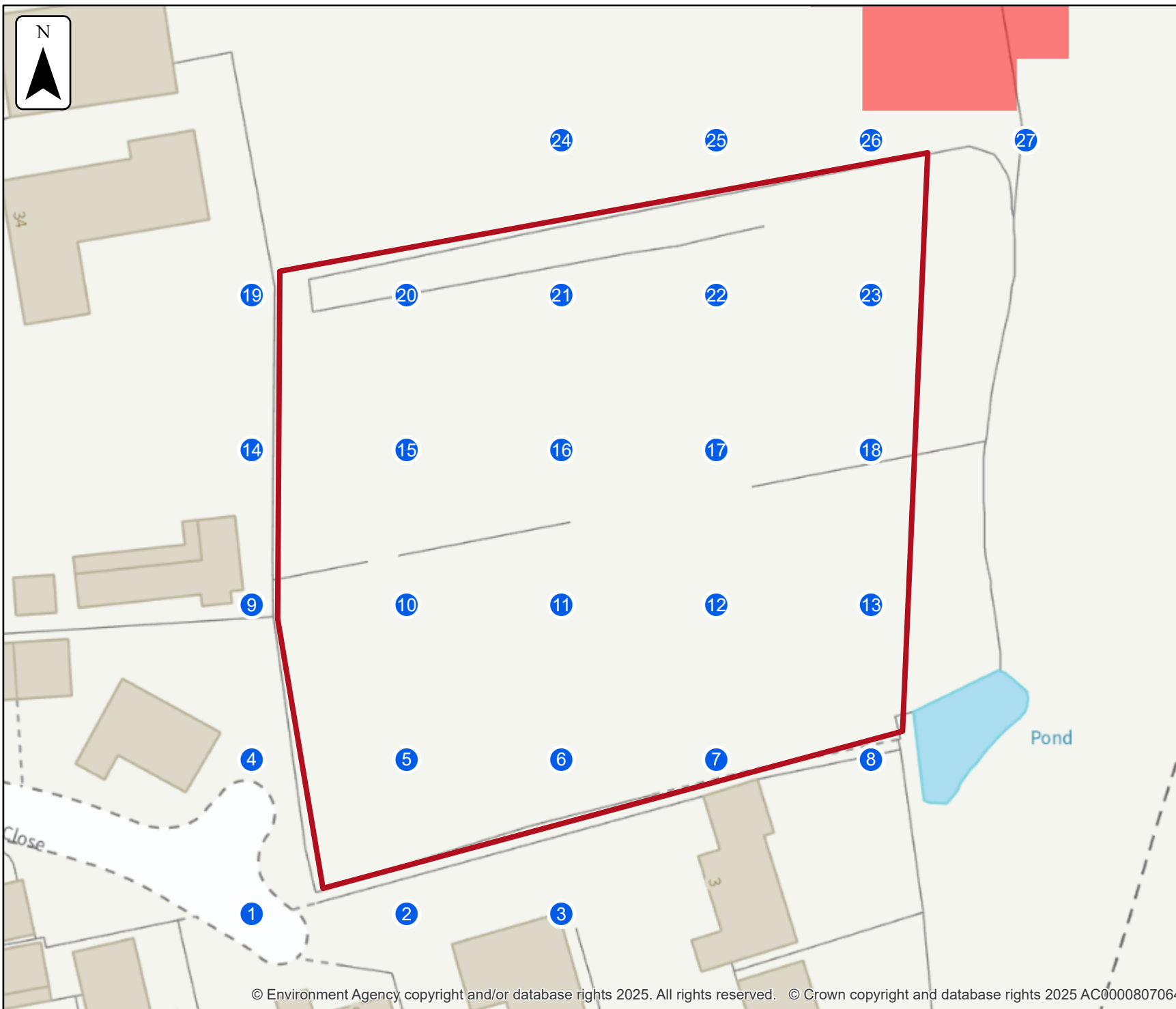
Label	Easting	Northing	5% AEP	1% AEP	0.1% AEP	5% AEP	1% AEP	0.1% AEP
			Depth	Depth	Depth	Height	Height	Height
25	518378	231549	NoData	NoData	NoData	NoData	NoData	NoData
26	518393	231549	NoData	NoData	NoData	NoData	NoData	NoData
27	518408	231549	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	NoData	NoData

Data in this table comes from the EAn Ivel Project Ivel Model 2019 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.

'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.



Defended climate change modelled fluvial extent and height

Location (easting/northing)
518366/231513

Scale Created
1:500 9 Apr 2025

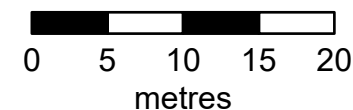
Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Main river

Modelled 2D grid
Water level in mAOD

-  0 - 0.0
-  0.0 - 6.375
-  6.375 - 12.75
-  12.75 - 19.125
-  19.125 - 25.5
-  25.5 - 31.875
-  31.875 - 38.25
-  38.25 - 44.625
-  44.625 - 51.0

This map shows the
0.1% AEP +65% height data



Sample point data

Defended climate change

Label	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	0.5% AEP (+25%)	0.5% AEP (+35%)	0.5% AEP (+65%)	0.1% AEP (+25%)	0.1% AEP (+35%)	0.1% AEP (+65%)
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
1	518333	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
2	518348	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	518363	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
4	518333	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	518348	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	518363	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
7	518378	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
8	518393	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
9	518333	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	518348	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	518363	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	518378	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	0.5% AEP (+25%)	0.5% AEP (+35%)	0.5% AEP (+65%)	0.1% AEP (+25%)	0.1% AEP (+35%)	0.1% AEP (+65%)
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
13	518393	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
14	518333	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	518348	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	518363	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
17	518378	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	518393	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
19	518333	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
20	518348	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	518363	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	518378	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	518393	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
24	518363	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	0.5% AEP (+25%)	0.5% AEP (+35%)	0.5% AEP (+65%)	0.1% AEP (+25%)	0.1% AEP (+35%)	0.1% AEP (+65%)
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
25	518378	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	518393	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
27	518408	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Data in this table comes from the EAn Ivel Project Ivel Model 2019 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.

'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

Defended climate change

Label	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	0.5% AEP (+25%)	0.5% AEP (+35%)	0.5% AEP (+65%)	0.1% AEP (+25%)	0.1% AEP (+35%)	0.1% AEP (+65%)
			Height	Height	Height	Height	Height	Height	Height	Height	Height
1	518333	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
2	518348	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	518363	231474	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
4	518333	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	518348	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	518363	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
7	518378	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
8	518393	231489	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
9	518333	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	518348	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	518363	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	518378	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

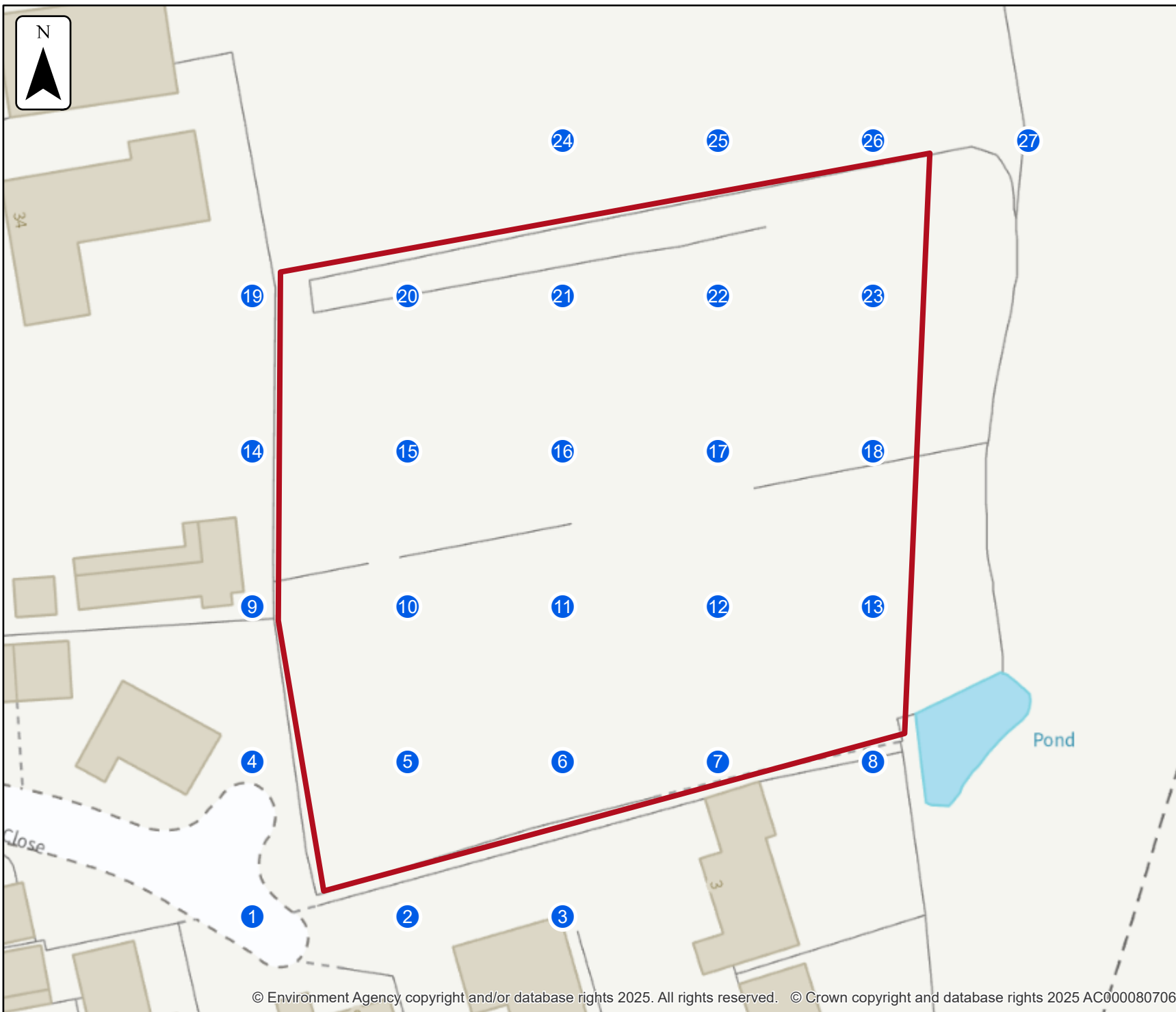
Label	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	0.5% AEP (+25%)	0.5% AEP (+35%)	0.5% AEP (+65%)	0.1% AEP (+25%)	0.1% AEP (+35%)	0.1% AEP (+65%)
			Height	Height	Height	Height	Height	Height	Height	Height	Height
13	518393	231504	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
14	518333	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	518348	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	518363	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
17	518378	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	518393	231519	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
19	518333	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
20	518348	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	518363	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	518378	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	518393	231534	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
24	518363	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	0.5% AEP (+25%)	0.5% AEP (+35%)	0.5% AEP (+65%)	0.1% AEP (+25%)	0.1% AEP (+35%)	0.1% AEP (+65%)
			Height	Height	Height	Height	Height	Height	Height	Height	Height
25	518378	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	518393	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
27	518408	231549	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Data in this table comes from the EAn Ivel Project Ivel Model 2019 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.

'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.



Defences removed climate change modelled fluvial extent and height

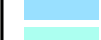
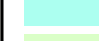
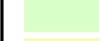
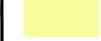
Location (easting/northing)
518366/231513

Scale Created
1:500 9 Apr 2025

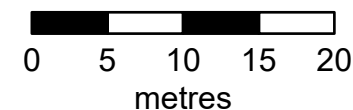
Model name
**EAn Ivel Project
Model 2019**

-  Selected area
-  Main river

Modelled 2D grid
Water level in mAOD

-  0 - 49.0
-  49.0 - 49.125
-  49.125 - 49.25
-  49.25 - 49.375
-  49.375 - 49.5
-  49.5 - 49.625
-  49.625 - 49.75
-  49.75 - 49.875
-  49.875 - 50.0

This map shows the
1% AEP +65% height data



Sample point data

Defences removed climate change

Label	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)
			Depth	Depth	Depth	Height	Height	Height
1	518333	231474	NoData	NoData	NoData	NoData	NoData	NoData
2	518348	231474	NoData	NoData	NoData	NoData	NoData	NoData
3	518363	231474	NoData	NoData	NoData	NoData	NoData	NoData
4	518333	231489	NoData	NoData	NoData	NoData	NoData	NoData
5	518348	231489	NoData	NoData	NoData	NoData	NoData	NoData
6	518363	231489	NoData	NoData	NoData	NoData	NoData	NoData
7	518378	231489	NoData	NoData	NoData	NoData	NoData	NoData
8	518393	231489	NoData	NoData	NoData	NoData	NoData	NoData
9	518333	231504	NoData	NoData	NoData	NoData	NoData	NoData
10	518348	231504	NoData	NoData	NoData	NoData	NoData	NoData
11	518363	231504	NoData	NoData	NoData	NoData	NoData	NoData
12	518378	231504	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)
			Depth	Depth	Depth	Height	Height	Height
13	518393	231504	NoData	NoData	NoData	NoData	NoData	NoData
14	518333	231519	NoData	NoData	NoData	NoData	NoData	NoData
15	518348	231519	NoData	NoData	NoData	NoData	NoData	NoData
16	518363	231519	NoData	NoData	NoData	NoData	NoData	NoData
17	518378	231519	NoData	NoData	NoData	NoData	NoData	NoData
18	518393	231519	NoData	NoData	NoData	NoData	NoData	NoData
19	518333	231534	NoData	NoData	NoData	NoData	NoData	NoData
20	518348	231534	NoData	NoData	NoData	NoData	NoData	NoData
21	518363	231534	NoData	NoData	NoData	NoData	NoData	NoData
22	518378	231534	NoData	NoData	NoData	NoData	NoData	NoData
23	518393	231534	NoData	NoData	NoData	NoData	NoData	NoData
24	518363	231549	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)	1% AEP (+25%)	1% AEP (+35%)	1% AEP (+65%)
			Depth	Depth	Depth	Height	Height	Height
25	518378	231549	NoData	NoData	NoData	NoData	NoData	NoData
26	518393	231549	NoData	NoData	NoData	NoData	NoData	NoData
27	518408	231549	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	NoData	NoData

Data in this table comes from the EAn Ivel Project Ivel Model 2019 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.

'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

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

Your Lead Local Flood Authority is Hertfordshire County.

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 East Anglia Environment Agency team at enquiries_eastanglia@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



Stomor Ltd		Page 1
32 Beehive Lane Welwyn Garden City Herts AL7 4BQ		
Date 26/10/2025 09:06 File 3472.MDX	Designed by Sam Checked by	
Micro Drainage Network 2020.1		

Simulation Criteria for Surface Network 1

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 527230 220892 TL 27230 20892
Data Type	Point
Summer Storms	Yes
Winter Storms	No
Cv (Summer)	1.000
Cv (Winter)	0.840
Storm Duration (mins)	30

©1982-2020 Innovyze

Stomor Ltd		Page 2
32 Beehive Lane Welwyn Garden City Herts AL7 4BQ		
Date 26/10/2025 09:06 File 3472.MDX	Designed by Sam Checked by	
Micro Drainage Network 2020.1		

Online Controls for Surface Network 1

Hydro-Brake® Optimum Manhole: S6, DS/PN: 1.005, Volume (m³): 130.3

Unit Reference	MD-SHE-0051-1000-0650-1000
Design Head (m)	0.650
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	51
Invert Level (m)	49.143
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.650	1.0
Flush-Flo™	0.205	1.0
Kick-Flo®	0.421	0.8
Mean Flow over Head Range	-	0.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.9	1.200	1.3	3.000	2.0	7.000	3.0
0.200	1.0	1.400	1.4	3.500	2.1	7.500	3.1
0.300	1.0	1.600	1.5	4.000	2.3	8.000	3.2
0.400	0.9	1.800	1.6	4.500	2.4	8.500	3.3
0.500	0.9	2.000	1.7	5.000	2.5	9.000	3.4
0.600	1.0	2.200	1.7	5.500	2.6	9.500	3.4
0.800	1.1	2.400	1.8	6.000	2.7		
1.000	1.2	2.600	1.9	6.500	2.9		

Stomor Ltd		Page 3
32 Beehive Lane Welwyn Garden City Herts AL7 4BQ		
Date 26/10/2025 09:06 File 3472.MDX	Designed by Sam Checked by	
Micro Drainage Network 2020.1		

Storage Structures for Surface Network 1

Porous Car Park Manhole: S2, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	35.0
Max Percolation (l/s)	58.3	Slope (1:X)	40.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	50.298	Cap Volume Depth (m)	0.600

Complex Manhole: S3, DS/PN: 1.002

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	40.0
Max Percolation (l/s)	66.7	Slope (1:X)	40.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	49.392	Cap Volume Depth (m)	0.600

Tank or Pond

Invert Level (m) 49.392

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	115.0	0.500	115.0	0.501	0.0

Stomor Ltd		Page 4							
32 Beehive Lane Welwyn Garden City Herts AL7 4BQ									
Date 26/10/2025 09:06 File 3472.MDX									
Designed by Sam Checked by									
Micro Drainage		Network 2020.1							
Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1									
Simulation Criteria									
Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000									
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000									
Hot Start Level (mm) 0 Inlet Coefficient 0.800									
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000									
Foul Sewage per hectare (l/s) 0.000									
Number of Input Hydrographs 0 Number of Storage Structures 2									
Number of Online Controls 1 Number of Time/Area Diagrams 0									
Number of Offline Controls 0 Number of Real Time Controls 0									
Synthetic Rainfall Details									
Rainfall Model FEH									
FEH Rainfall Version 2013									
Site Location GB 513499 213885 TL 13499 13885									
Data Type Point									
Cv (Summer) 1.000									
Cv (Winter) 1.000									
Margin for Flood Risk Warning (mm) 300.0									
Analysis Timestep 2.5 Second Increment (Extended)									
DTS Status ON									
DVD Status OFF									
Inertia Status OFF									
Profile(s) Summer and Winter									
Duration(s) (mins) 30, 60, 120, 240, 360, 480, 960, 1440									
Return Period(s) (years) 2									
Climate Change (%) 0									
Water									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
1.000	S1	30 Summer	2	+0%					50.447
1.001	S2	30 Summer	2	+0%					50.371
1.002	S3	120 Summer	2	+0%					49.501
1.003	S4	360 Winter	2	+0%					49.468
1.004	S5	360 Winter	2	+0%					49.468
1.005	S6	360 Winter	2	+0%					49.468
Surcharged Flooded				Half Drain Pipe				Level	
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Exceeded
1.000	S1	-0.123	0.000	0.42			8.6	OK	
1.001	S2	-0.152	0.000	0.23		7	16.1	OK	
1.002	S3	-0.041	0.000	0.87		30	15.6	OK	
1.003	S4	-0.442	0.000	0.01			7.3	OK	
1.004	S5	-0.432	0.000	0.01			6.6	OK	
©1982-2020 Innovyze									

Stomor Ltd		Page 1
32 Beehive Lane Welwyn Garden City Herts AL7 4BQ		
Date 26/10/2025 09:00 File 3472.MDX	Designed by Sam Checked by	
Micro Drainage	Network 2020.1	

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Surcharged Flooded			Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)		
1.005	S6	-0.001	0.000	0.00			1.0	FLOOD RISK

1.005	S6	-0.001	0.000	0.00	1.0 FLOOD RISK
-------	----	--------	-------	------	----------------

stomor
CIVIL ENGINEERING CONSULTANTS

Suite 2 First Floor
Portmill House
Portmill Lane
Hitchin
Hertfordshire SG5 1DJ

01462 615433
info@stomor.com
www.stomor.com

