Keystone
Design Associates Ltd.

Flood Risk Assessment

LAND OFF HILL HOUSE INDUSTRIAL ESTATE, THORNTON-CLEVELEYS

October 2023

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DOCUMENT ISSUE RECORD

Revision	Date	Details
Full	October 2023	Issued for action

LAND OFF HILL HOUSE INDUSTRIAL ESTATE, THORNTON-CLEVELEYS

Report Approved by D.W.Hadwin B.Eng(Hons) C.Eng MICE
For Keystone Design Associates

Signature……..

Date…….. 17th October 2023……

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1. Introduction
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1.0 Introduction

1.1 Keystone Design Associates Ltd have been commissioned to carry out a flood risk assessment in compliance with NPPF Technical Guidance for the proposed industrial unit on the site at land off Hill House Industrial Estate, Thornton-Cleveleys of approximately 0.42 Ha as detailed in the location plan in appendix 1. This Location Plan shows the position of the site in relation to its surroundings. The scheme is detailed on the drawings attached as Appendix 3.

1.2 The development site is a brownfield site adjacent to Hill House Industrial Estate, Thornton-Cleveleys. The site is surrounded by land to the north and east, commercial/industrial buildings to the south and a residential development to the west. The site is situated in Thornton-Cleveleys. The site is accessed directly off Bourne Street.

1.3 The site in general is within Flood Zone 2/3.

1.4 A flood risk assessment is required to be prepared in relation to the redevelopment potential of the site and is a requirement of the Environment Agency due the following.

- The site is within the indicative flood risk area as detailed on the Environment Agency Flood Zone Maps issued to the Council. The proposed development site lies within Flood Zone 2/3, as described in NPPF Technical Guidance as follows: and a flood risk assessment is, therefore, required.

Zone 2 Medium Probability
Definition
This zone comprises land assessed as having between 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1,000 annual probability of flooding from the sea (0.5% - 0.1%) in any year.
Appropriate Uses
The water-compatible and less vulnerable uses of land in Table D.2 are appropriate in this zone. This highly vulnerable uses in Table D.2 should not be permitted in this zone. The more vulnerable and essential infrastructure uses in Table D.2 should only be permitted in the zone if the Exception Test (see para. D.9) is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.
FRA Requirements
All development proposals in this zone should be accompanied by a FRA.

Zone 3a High Probability
Definition
This zone comprises land assessed as having 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Appropriate Uses
The water-compatible and less vulnerable uses of land in Table D.2 are appropriate in this zone. This highly vulnerable uses in Table D.2 should not be permitted in this zone.

The more vulnerable and essential infrastructure uses in Table D.2 should only be permitted in the zone if the Exception Test (see para. D.9) is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

FRA Requirements

All development proposals in this zone should be accompanied by a FRA.

2.0 Development Proposals

2.1 The development comprises of the erection of an industrial unit at land off Hill House Industrial Estate, Thornton-Cleveleys. The necessary infrastructure to cater for the industrial unit will need to be installed.

2.2 The access to the development will be directly off Bourne Street.

2.3 It is proposed that surface water sewage from the development will be discharged into a dyke located to the east of the site via new proposed manholes and foul sewage will be discharged into a sewage treatment plant and then into the dyke.

3.0 Environment Agency and Local Authority Contact

3.1 The Environment Agency's (EA) website allows the review of the potential flood risk for any particular site and an extract of the relative area is included as Appendix 4. The map shows that flood zone 3 covers and surrounds the proposed development with parts in flood zone 2. The risk of flooding arises from a potential breach of the river defences.

4.0 Sources of Flooding

4.1 This Flood Risk Assessment is informed specifically by the Flood Risk Assessment data supplied by the Environment Agency. The Flood Risk data is attached as Appendix 4.

4.2 **Rivers** –To the east of the site is the River Wyre. This is considered to be a principal risk to the site as discussed below; however, this risk is low and will only affect part of the site.

4.3 **Land** – Nil risk of flooding. The site is located in a topography of flat ground surrounded by a mixture of commercial and residential properties. Surface water dissipates rapidly.

4.4 **Groundwater** – Nil risk of flooding. The Environment Agency's Ground Water Vulnerability Zone indicates that the proposed development sits within an area that is designated 'Low' overall pollution risk to groundwater from surface activities. The level of groundwater is not noted on the maps; however it is not anticipated that the groundwater will not pose a risk to the completed development. There has been no standing water observed on site.

4.5 **Tidal/Storm Surge** - Nil risk of flooding.

4.6 The predicted flood levels for River Wyre for various events are provided by EA in the Flood Risk Assessment data which covers a number of modelled scenarios. Data has been taken from the Flood Risk Assessment Data as attached in appendix 4. The results of which are as follows:

Tidal defended 0.1% AEP does not affect the proposed site
Tidal defended 0.5% AEP + Climate Change (20%) (+370 SLR) is 5.91m AOD
Tidal defended 0.5% AEP + Climate Change (20%) (+670 SLR) is 6.28m AOD
Tidal defended 0.5% AEP + Climate Change (20%) (+970 SLR) is 6.54m AOD

Tidal undefended 0.1% AEP is 6.50m AOD
Tidal undefended 0.5% AEP is 6.21m AOD
Tidal undefended 0.5% AEP + Climate Change (20%) (+370 SLR) is 6.58m AOD
Tidal undefended 0.5% AEP + Climate Change (20%) (+670 SLR) is 6.89m AOD
Tidal undefended 0.5% AEP + Climate Change (20%) (+970 SLR) is 7.12m AOD

4.7 In the unlikely event of a breach of an extreme return period tidal flood, inundation of the Thornton-Cleveleys area and potentially the development site may occur. The flood risk to the development would be dependent upon a number of factors including the magnitude of the event, location and extent of the breach and the timing of the emergency response. It is important to highlight that the likelihood of such a potentially catastrophic event is extremely remote. In the event of a breach the site would be at risk.

4.8 **Sewers** – There is no surcharging of sewers reported by United Utilities.

4.9 **Reservoirs** – There are no reservoirs within the area that present any form of risk.

5.0 Flooding History

5.1 Historic research has identified the 22nd-23rd November 2017 event, an intense rain storm was recorded traveling from the Irish Sea coast at Blackpool to the north-easterly extent of Lancaster District. Whilst some other parts of the county were affected in more modest ways, communities lying under the path of this storm experienced extreme downpours that exceeded the intensities experienced during Storm Desmond (5/6 December 2015). This rainfall event was highly damaging. It overwhelmed natural and constructed drainage networks in its path, causing extensive surface water and river flooding. It dislodged soil/silt and vegetation which blocked drainage networks that might otherwise have coped with the surface water. Over 900 homes and other premises in Lancashire were flooded that night, either within the property boundaries or inside habitable rooms. The Environment Agency evacuated 70 households from their homes in Galgate overnight, and United Utilities staff worked throughout the night to gain control over sewer flooding across Blackpool and Thornton-Cleveleys areas of the Fylde. Many roads including those used for critical emergency access (including the M6 motorway and the A6) were obstructed by flood water, and bow-waves from passing traffic caused standing water to enter houses and other property close to the roads. Trains north of Preston were cancelled and problems continued overnight with 9 flood warnings and 12 flood alerts still in place on the morning of 23 November. This event did not affect the proposed site.

6.0 Existing Flood Defence Works

6.1 The site is protected from flooding by defences. A brief description of each of the defence lengths is summarised below.

Asset Type	Standard of Protection (years)	Current Condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
Embankment	200	Fair	6.95	7.06	6.95
Embankment	25	Fair	6.48	6.89	6.48

7.0 Previous Site Usage

7.1 The site is currently a brownfield site adjacent to Hill House Industrial Estate, Thornton-Cleveleys. The site is surrounded by land to the north and east, commercial/industrial buildings to the south and a residential development to the west. The site is situated in Thornton-Cleveleys. The site currently houses a single storey building.

8.0 Impact on Development

8.1 The primary, but unlikely, flood risk posed to the site is posed by tidal flooding, however; the site has no history of flooding. The proposal is also to be constructed on a site that is already built up.

8.2 Impact on Surrounding Properties

The proposal is for the erection of one commercial/industrial unit on the site, this unit will replace an existing building; any increase in surface water runoff will have no effect any immediate neighbours.

9.0 Flood Precaution & Limitation Measures

9.1 The following mitigation measures are proposed:

- Electrical services, wiring and switches/outlets will be positioned at a minimum height of 1200mm above the finished floor levels. Incoming main services are to be terminated at a minimum of 1.2m above floor level.
- Heating and ventilation equipment including boilers and cylinders will be installed at a minimum of 1.2m above ground floor level or at first floor level.
- Where practicable ovens and other electrical appliances will be positioned on raised floor levels or individual plinths
- Ground floors should be of a solid construction and to be 150mm thick with a screed finish.
- All drainage and waste water systems should be designed and installed with non return valves to prevent surcharge backup in the case of flooding to the surrounding sewage network.
- Surface water discharge will be discharged to the existing network.
- Removable stanking boards are to be provided for all external doors.
- Low porosity brick with two coat plaster to be 1.2m above finished floor levels.
- All manhole covers shall be lockable.

Occupiers will have access to the Environment Agency's existing flood early warning system; Occupiers will also be issued with guidance on what actions to take in the event of a warning including the closest area of high ground.

9.2 **Flood Evacuation Facilities**

The main access to the site is currently and will be from Bourne Street. The proposed works is an insignificant increase in the population, and would therefore be subject to the same flood warning as provided by the Environment Agency to the surrounding properties. In order for flood water to threaten this property a very major incident would have to be in progress.

9.3 There is an established flood warning system in place, to which occupiers will be encouraged to subscribe. They will also be advised of EA advice on personal flood planning.

9.4 A Flood Warning & Evacuation Plan is attached to Appendix 5 of this report.

10.0 Conclusion

10.1 It is considered that with the flood precaution & limitation measures in place as shown in 9.1 there is no immediate risk of flooding to the property with the exception of a breach scenario.

10.2 The flood mitigation measures proposed will provide additional protection should for any reason a flood occur.

10.3 The proposal does not adversely affect flood risk elsewhere. The nature of the site, being fully built up, does not allow for any positive improvement of flood risk elsewhere.

10.4 In the unlikely event of a breach of an extreme return period tidal flood, inundation of the Thornton-Cleveleys area and potentially the development may occur. The flood risk to the development would be dependent upon a number of factors including the magnitude of the event, location and extent of the breach and the timing of the emergency response. It is important to highlight that the likelihood of such a potentially catastrophic event is remote.

10.5 It is considered that there is no immediate risk of flooding to the proposed site.

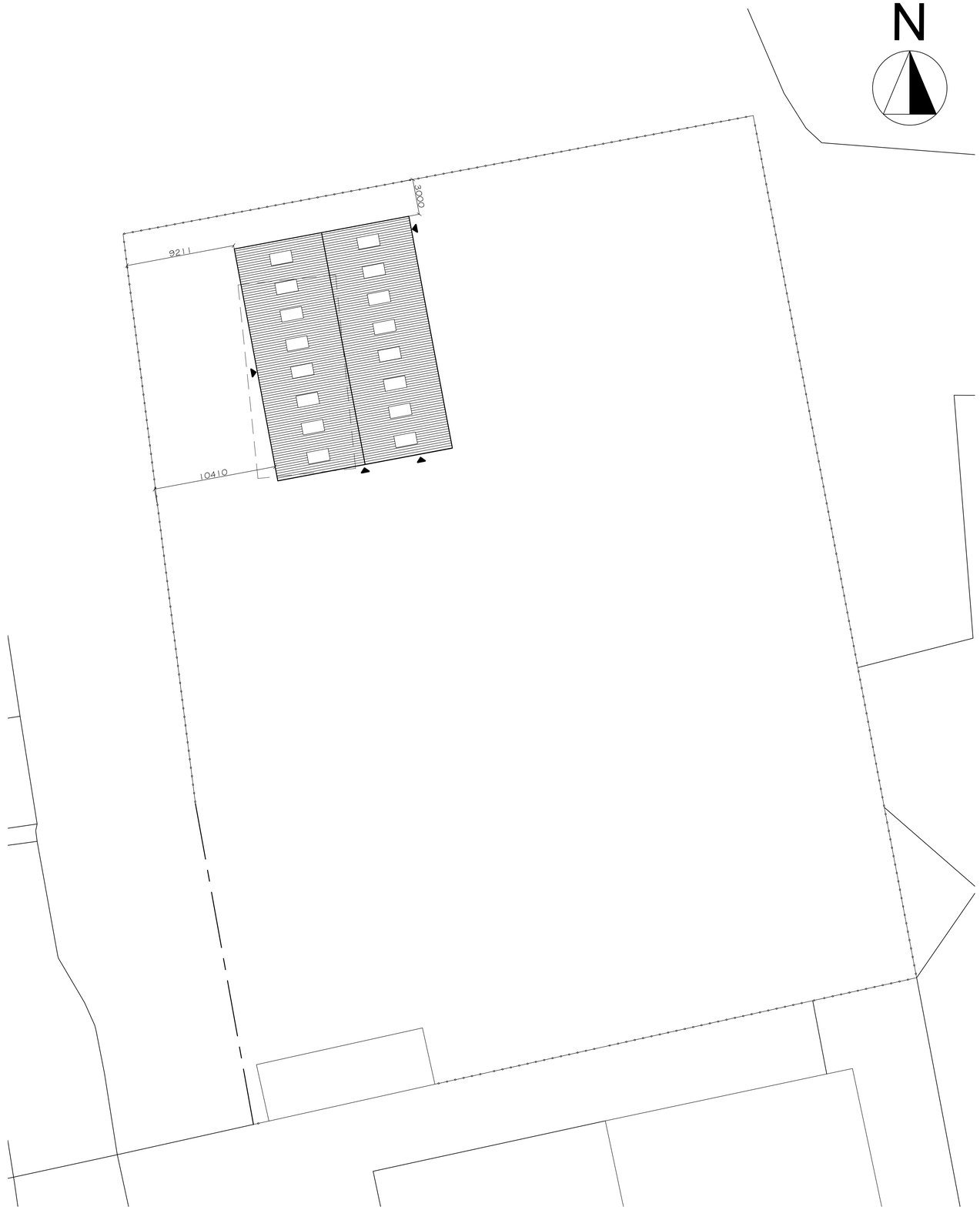
APPENDICES

Contents

1	Location Plan
2	Aerial Photograph
3	Proposed Works Drawing
4	Environment Agency Flood Level Mapping
5	Flood Warning & Evacuation Plan

APPENDIX 1
LOCATION PLAN

SITE LOCATION PLAN
SCALE 1:1000



SITE PLAN
SCALE 1:200

NOTES

1. ALL DIMENSION ARE IN MILLIMETERS.
2. DO NOT SCALE FROM THIS DRAWING.
3. THIS DRAWINGS IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELATED DRAWINGS & DOCUMENTS. THE USER SHOULD CONSULT THE DRAWING ISSUE REGISTER FOR DETAILS.
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5. THE ENGINEER/ARCHITECT SHOULD BE CONTACTED IMMEDIATELY IF THE ASSUMPTIONS USED IN THE DESIGN DIFFER TO THAT FOUND ON SITE.

Rev.	Amendments	Date	By

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PROJECT ADDRESS
LAND OFF HILL HOUSE INDUSTRIAL ESTATE,
THORNTON-CLEVELEYS, FY5 4QD

PROJECT TITLE
NEW INDUSTRIAL BUILDING

DRAWING TITLE
PROPOSED SITE GA
(OPTION 2)

Client:	Scales @A1
MRS J HILL	1:1000/200

Drawn By.	Checked By.	Date
JG	DWH	03/10/23

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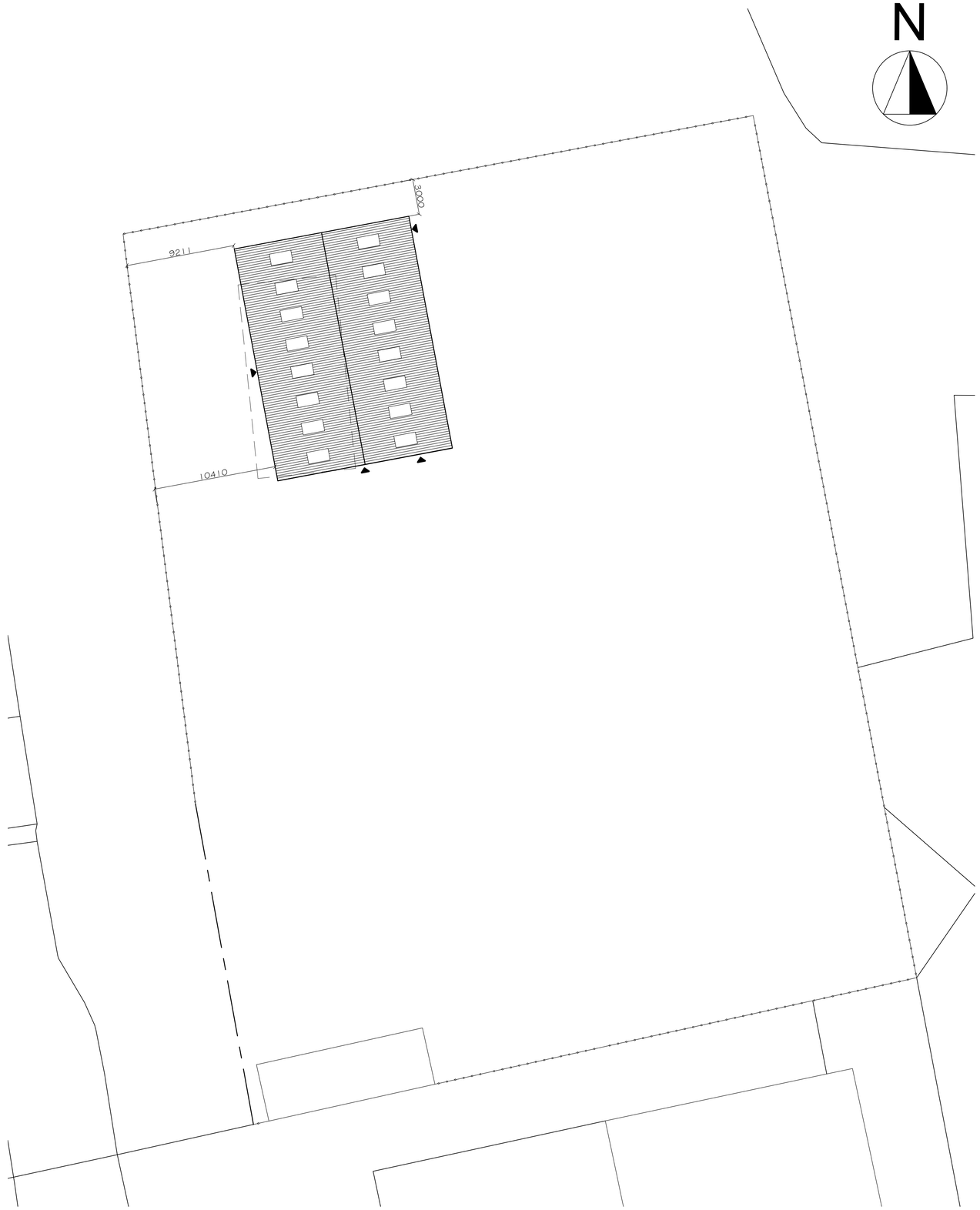
APPENDIX 2
AERIAL PHOTOGRAPH

Aerial View of land adjacent Hill House Industrial Estate, Thornton-Cleveleys

APPENDIX 3
PROPOSED WORKS DRAWING

SITE LOCATION PLAN
SCALE 1:1000



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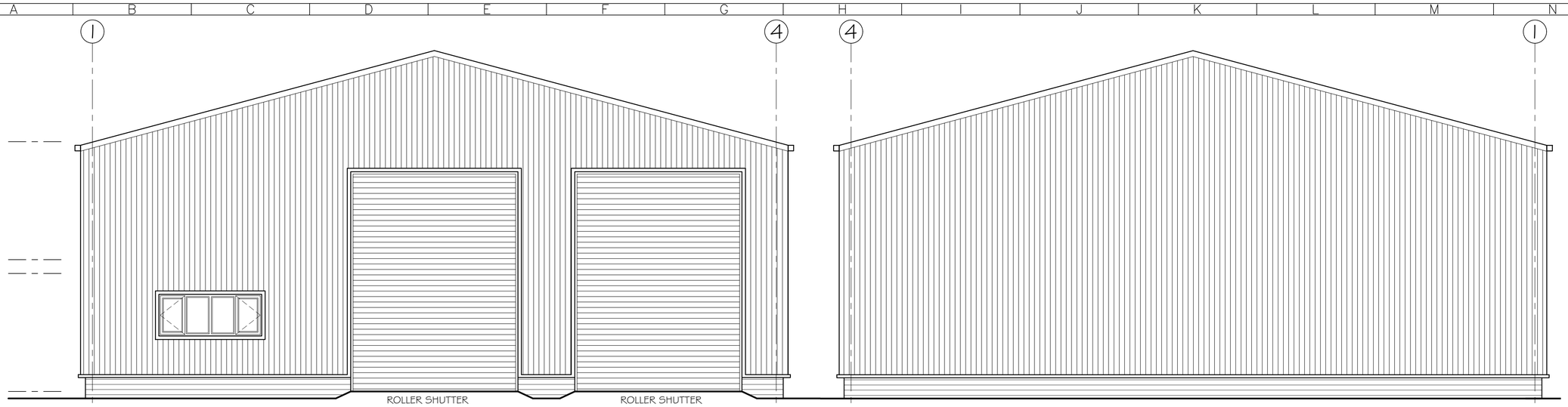
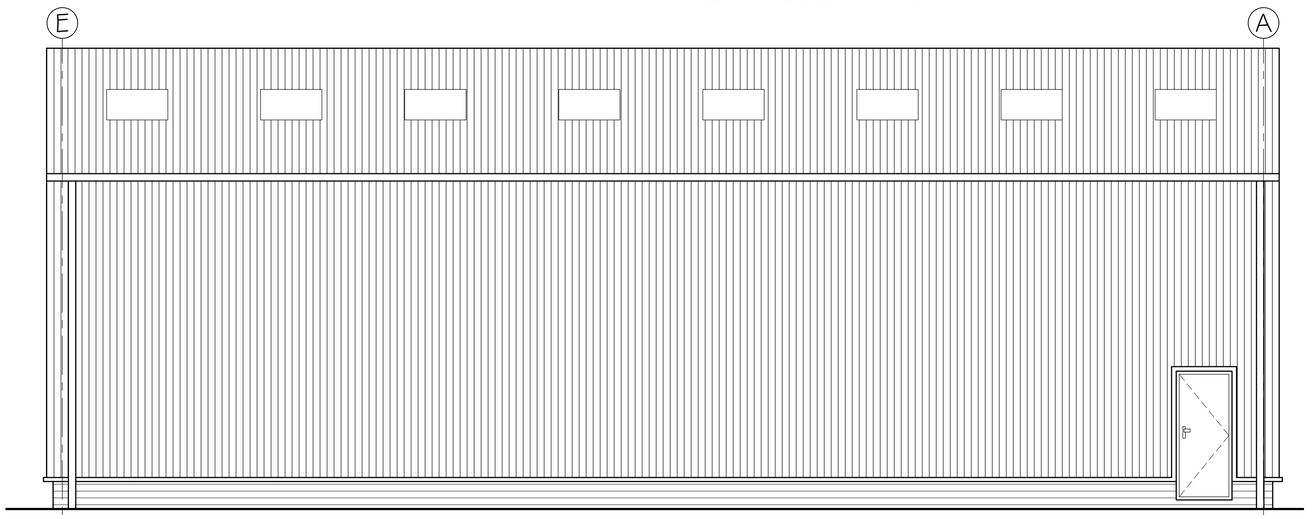
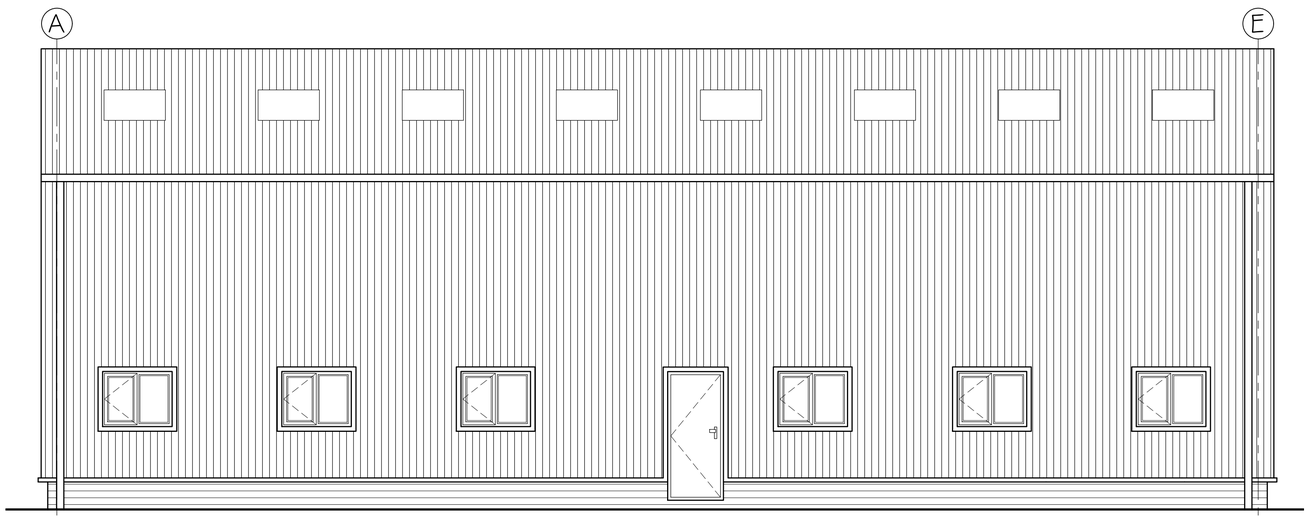


FRONT ELEVATION

REAR ELEVATION



SIDE ELEVATION



SIDE ELEVATION

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MATERIAL SPECIFICATION
ROOF CLADDING KINGSPAN INSULATED PANELS - COLOUR GOOSEWING GREY
EXTERNAL WALLS ROUGH FACED RED BRICK KINGSPAN INSULATED PANELS - COLOUR ANTHRACITE GREY
GLAZING ANTHRACITE GREY UPVC DOORS ANTHRACITE GREY UPVC
RAINWATER GOODS BLACK ALUMINIUM GUTTERING BLACK ALUMINIUM DOWNPIPES

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NEW INDUSTRIAL BUILDING

DRAWING TITLE
PROPOSED ELEVATIONS
(OPTION 2)

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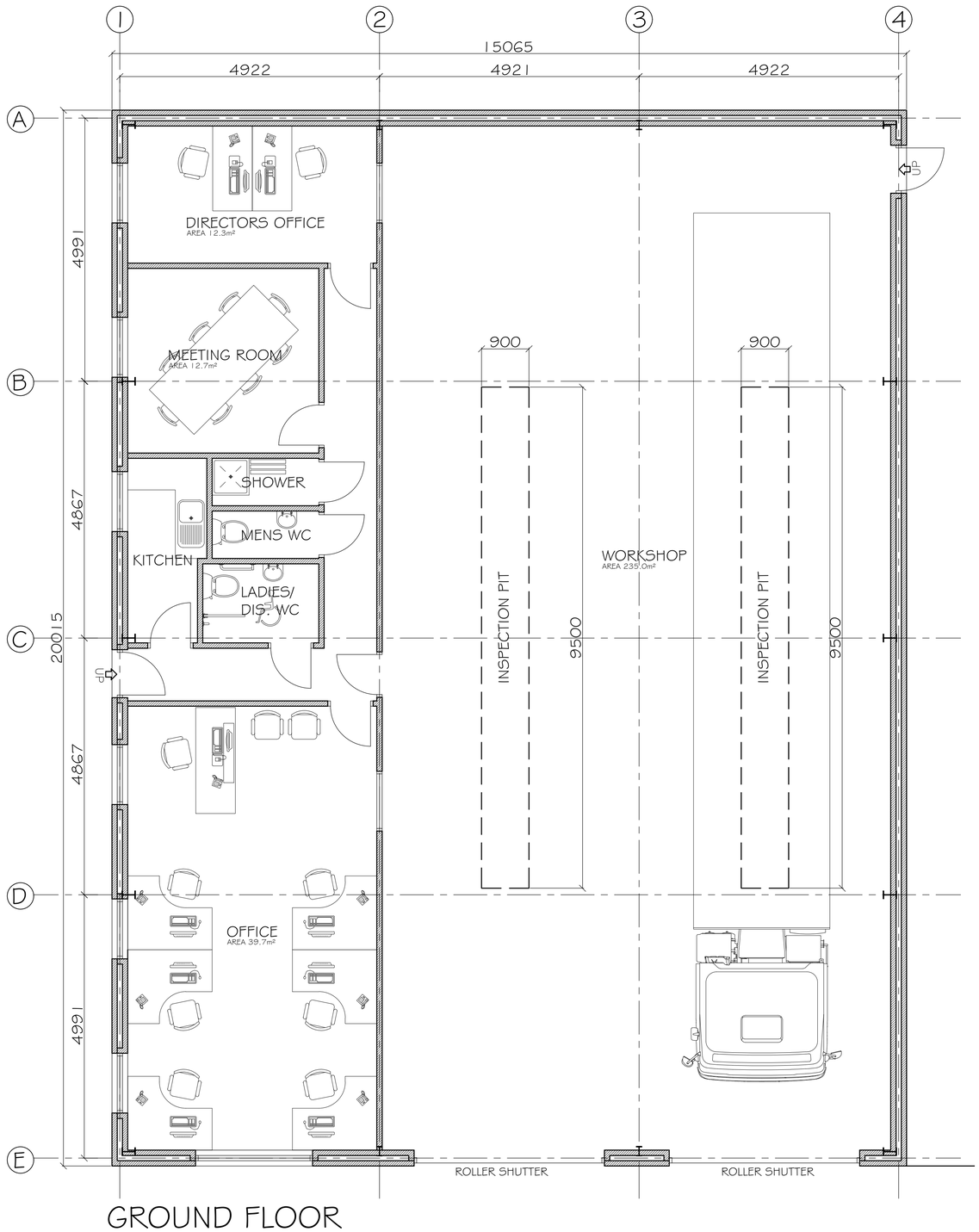
Revision -



GROUND FLOOR

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CONFIGURATION

GROUND FLOOR TOTAL AREA: 280m²

TOTAL SITE AREA: 4254m²

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DRAWING TITLE
PROPOSED FLOOR PLANS
(OPTION 2)

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Revision -

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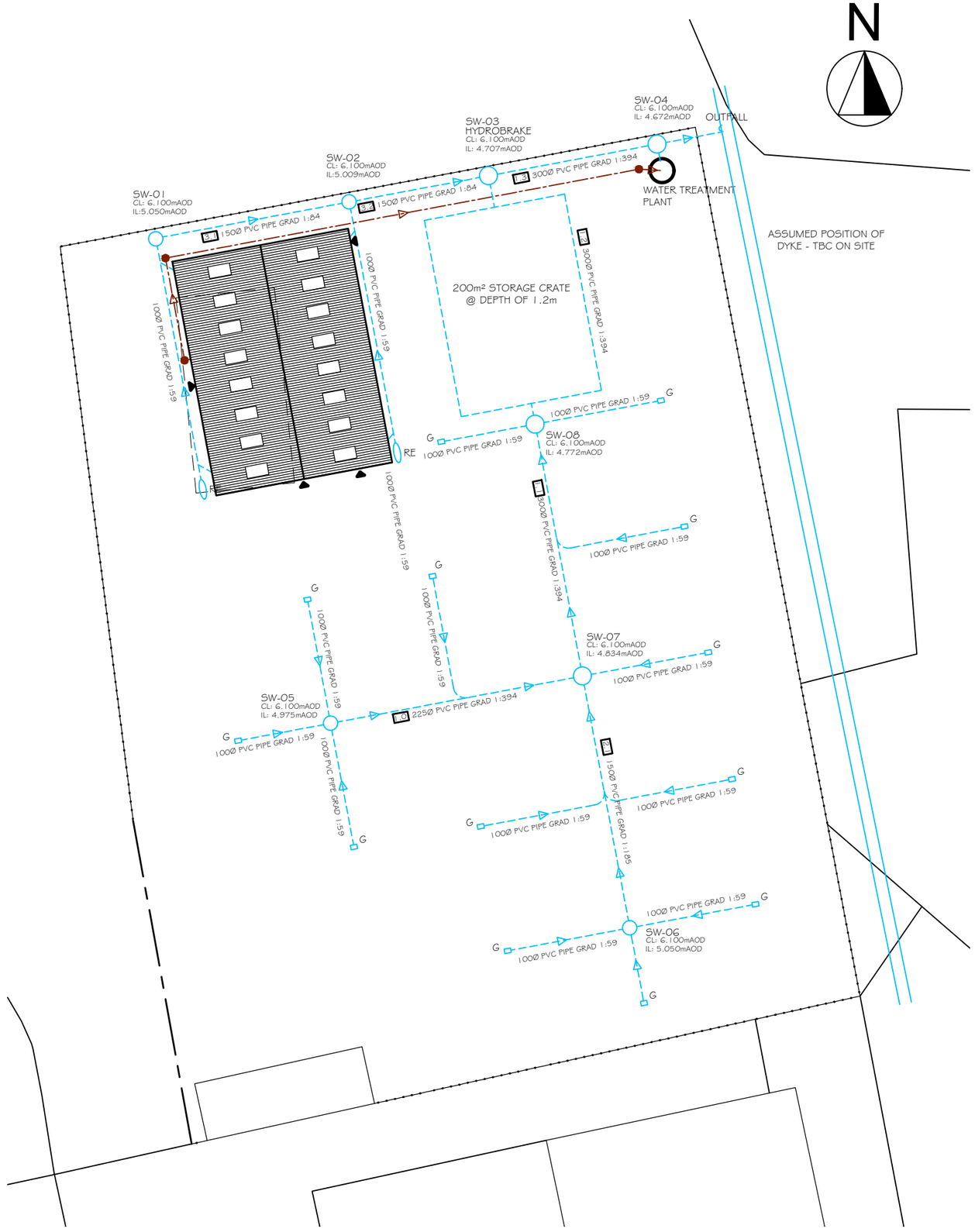

SURFACE WATER MANHOLE SCHEDULE											
M.H REF	CHAMBER TYPE	INTERNAL DIM	COVER GRADE	COVER LEVEL	INVERT LEVEL	DEPTH	PIPE	MATERIAL	DIAMETER	CHAMBER LAYOUT	NOTES
SW-01	TYPE 1	1200	STEEL	6.100	5.050	1.050	A B	PVC PVC	100 150		
SW-02	TYPE 1	1500	STEEL	6.100	5.009	1.091	A B C	PVC PVC PVC	150 100 150		
SW-03	TYPE 1	1500	STEEL	6.100	4.707	1.393	A B C	PVC PVC PVC	150 300 300		HYDROBRAKE INSTALLED
SW-04	TYPE 1	1500	PVC	6.100	4.672	1.428	A B C	PVC PVC PVC	300 100 300		
SW-05	TYPE 1	1800	PVC	6.100	4.975	1.125	A B C D	PVC PVC PVC PVC	100 100 100 225		
SW-06	TYPE 1	1200	STEEL	6.100	5.050	1.050	A B C D	PVC PVC PVC PVC	150 100 100 100		
SW-07	TYPE 1	1200	STEEL	6.100	4.834	1.266	A B C D	PVC PVC PVC PVC	300 225 100 150		
SW-08	TYPE 1	1200	PVC	6.100	4.772	1.328	A B C D	PVC PVC PVC PVC	300 100 100 300		

NOTES:
CHANNEL FITTINGS ARE TO BE USED IN ALL MANHOLES UPTO AND INCLUDING 300MM
ALL LEVELS RELATE TO ORDINANCE DATUM
ALL LATERAL PIPE CONNECTIONS TO BE MADE AT SOFFIT LEVEL WITH MAIN DRAIN
* = EXISTING PIPE

NOTES

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DRAWING KEY

- ..... DENOTES COMBINED DRAIN
- ..... DENOTES SURFACE WATER SEWER
- ..... DENOTES FOUL SEWER
- ..... DENOTES SW MANHOLE
- ..... DENOTES FOUL MANHOLE
- ..... DENOTES COMBINED MANHOLE
- ..... DENOTES STORM WATER STORAGE CRATE
- IC ..... DENOTES INSPECTION CHAMBER
- RE ..... DENOTES RODDING EYE
- RWP ..... DENOTES RAINWATER PIPE CONNECTION
- SVP ..... DENOTES SOIL VENT PIPE CONNECTION
- BIG ..... DENOTES BACK INLET GULLY
- G ..... DENOTES ROAD GULLEY
- ..... DENOTES CHANNEL
- +0.000 ..... DENOTES LEVEL
- 0.0 ..... DENOTES LINK REFERENCE

Rev.	Amendments	Date	By
A	Calculations Added	03/11/23	LM

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PROPOSED DRAINAGE (OPTION 2)

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A023/236/P/104	A

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APPENDIX 4
ENVIRONMENT AGENCY FLOOD LEVEL MAPPING

Flood risk assessment data

Location of site: 334125 / 444128 (shown as easting and northing coordinates)
Document created on: 8 September 2023
This information was previously known as a product 4.
Customer reference number: GW7DE3MMUCTX

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)
- flood defences and attributes
- information to help you assess if there is a reduced flood risk from rivers and the sea because of defences
- modelled data
- climate change modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Not included in this document

This document does not include a Flood Defence Breach Hazard Map.

If your location has a reduced flood risk from rivers and sea because of defences, you need to request a Flood Defence Breach Hazard Map and information about the level of flood protection offered at your location from the Cumbria and Lancashire Environment Agency team at inforequests.cmblnc@environment-agency.gov.uk. This information will only be available if modelling has been carried out for breach scenarios.

Include a site location map in your request.

Information that's unavailable

This document **does not** contain:

- historic flooding

We do not have historic flooding data for this location.

Please note that:

- flooding may have occurred that we do not have records for
- flooding can come from a range of different sources
- we can only supply flood risk data relating to floodng from rivers or the sea

You can contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.

Surface water and other sources of flooding

Use the long term flood risk service to find out about the risk of flooding from:

- surface water
- ordinary watercourses
- reservoirs

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

About the models used

Model name: Wyre Estuary_Tidal 2014
Scenario(s): Defended tidal, defences removed tidal, defended climate change tidal, defences removed climate change tidal
Date: 30 July 2014

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 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.

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

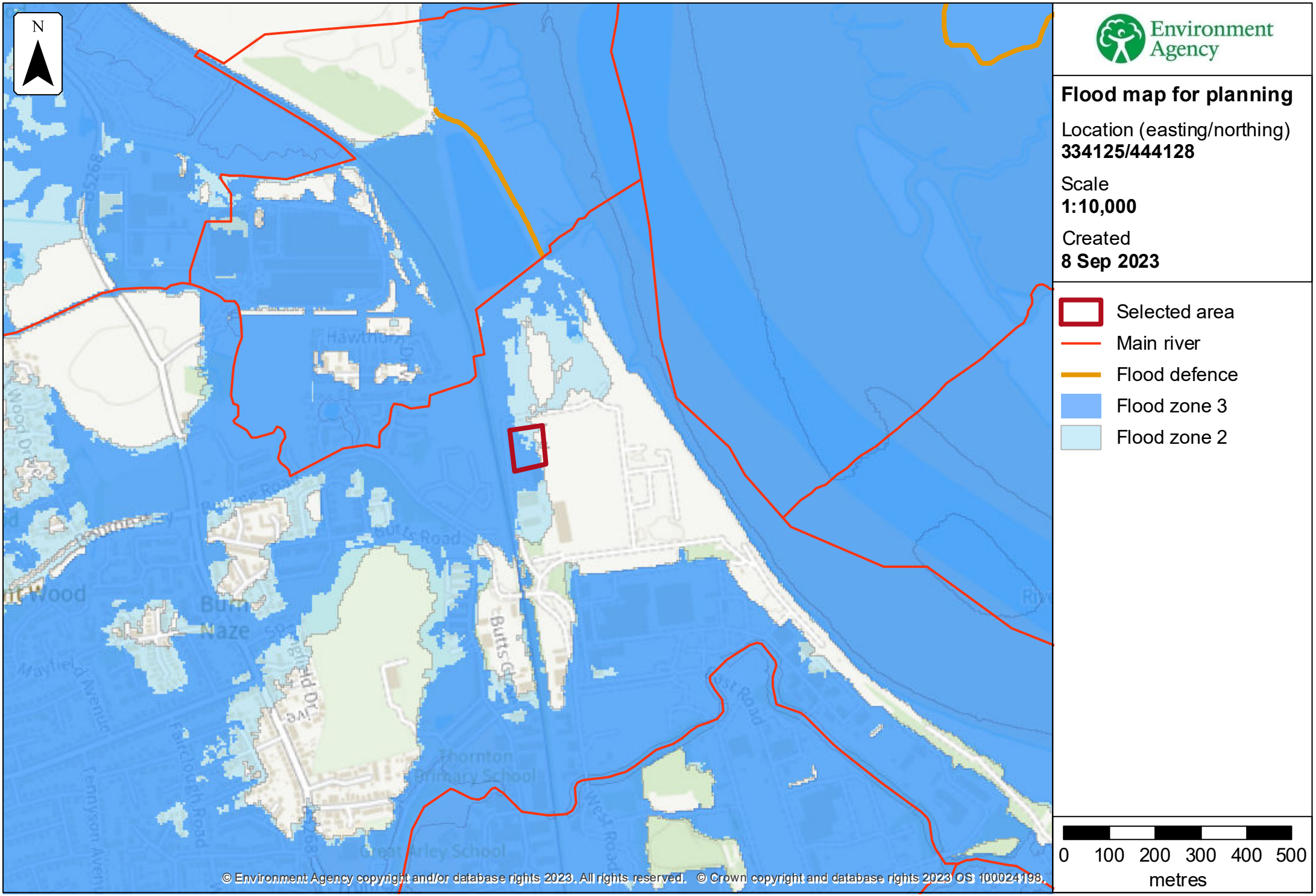
Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- 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.


N
Environment Agency
Flood map for planning
Location (easting/northing)
334125/444128
Scale
1:10,000
Created
8 Sep 2023
Selected area
Main river
Flood defence
Flood zone 3
Flood zone 2
0 100 200 300 400 500
metres
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Flood defences and attributes

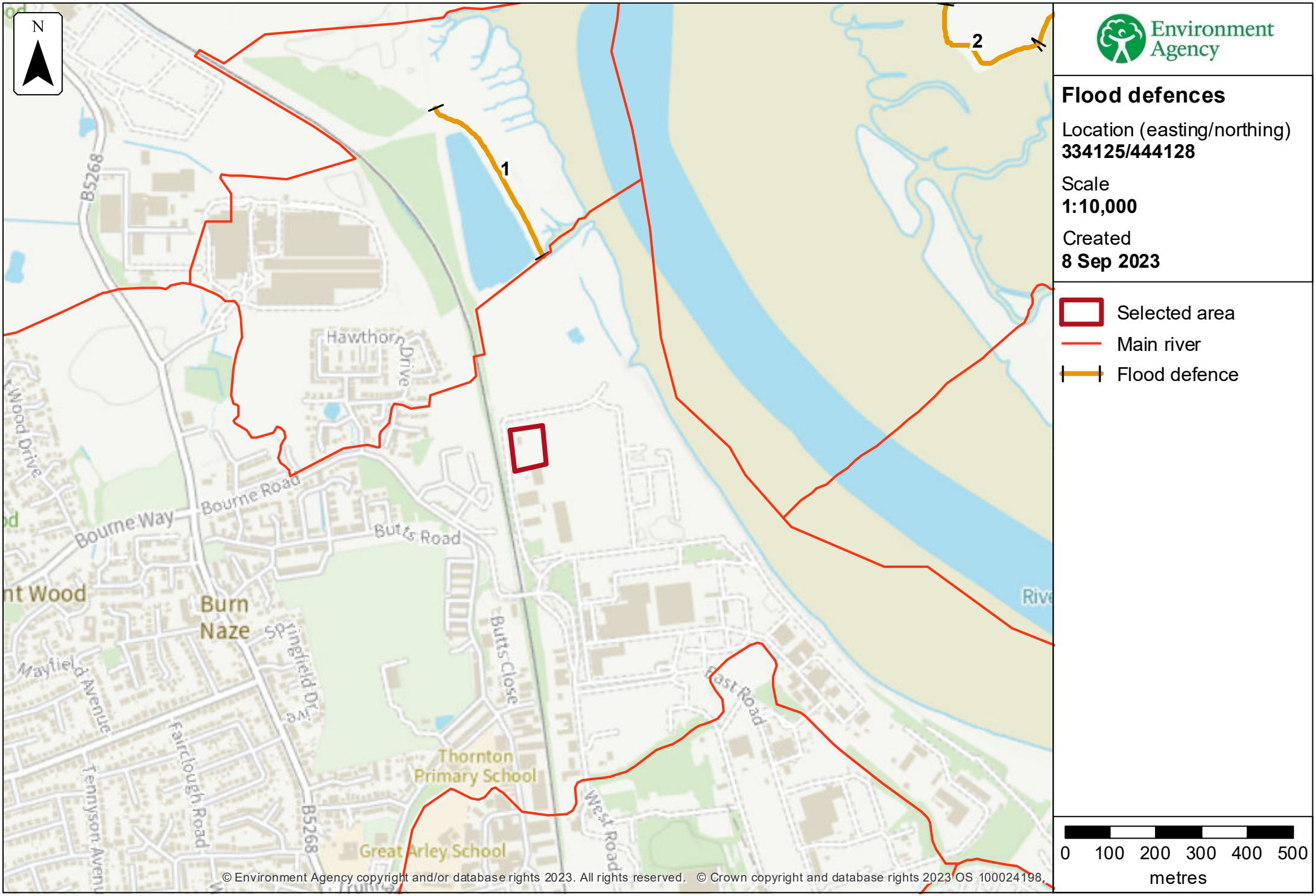
The flood defences map shows the location of the flood defences present.

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
1
2
B5268
Hawthorn Drive
Wood Drive
Bourne Way
Bourne Road
Butts Road
Burn Naze
Springfield Drive
Mayfield Avenue
Fairclough Road
Tennyson Avenue
B5268
Butts Close
East Road
West Road
Thornton Primary School
Great Arley School
Environment Agency
Flood defences
Location (easting/northing)
334125/444128
Scale
1:10,000
Created
8 Sep 2023
Selected area
Main river
Flood defence
0 100 200 300 400 500
metres
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Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	105371	Embankment	200	Fair	6.95	7.06	6.95
2	106934	Embankment	25	Fair	6.48	6.89	6.48

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

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

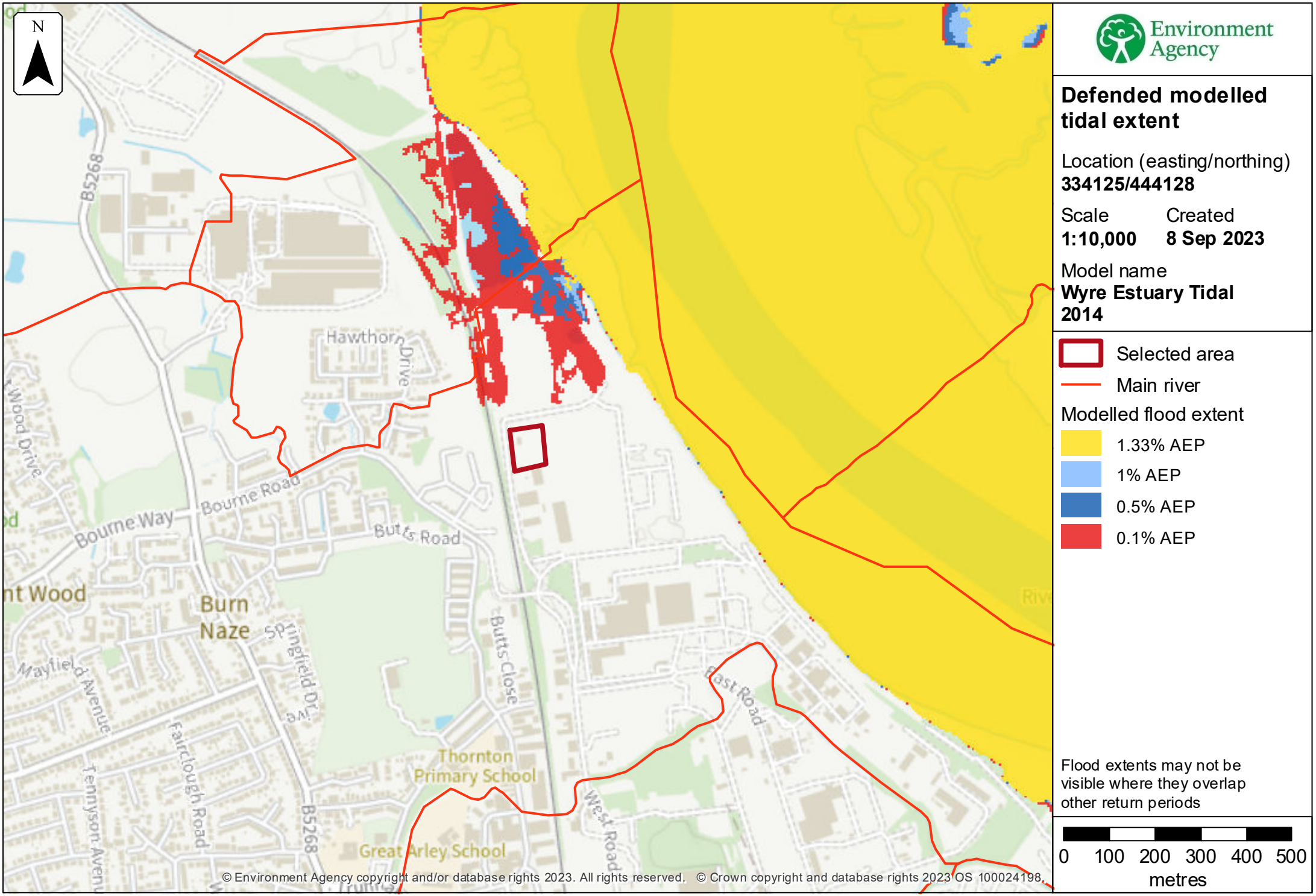
The climate change data included in the models may not include the latest flood risk assessment climate change allowances. Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

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
- Defended modelled tidal: risk of flooding from the sea where there are flood defences
- Defences removed modelled tidal: risk of flooding from the sea where flood defences have been removed
- 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
- Defended climate change modelled tidal: risk of flooding from the sea where there are flood defences, including estimated impact of climate change
- Defences removed climate change modelled tidal: risk of flooding from the sea where flood defences have been removed, including estimated impact of climate change


N
B5268
Hawthorn Drive
Wood Drive
Bourne Way
Bourne Road
Butts Road
Burn Naze
Springfield Drive
Mayfield Avenue
Fairclough Road
Tennyson Avenue
Butts Close
East Road
West Road
Thornton Primary School
Great Arley School
B5268
Environment Agency
Defended modelled tidal extent
Location (easting/northing)
334125/444128
Scale
1:10,000
Created
8 Sep 2023
Model name
Wyre Estuary Tidal 2014
Selected area
Main river
Modelled flood extent
1.33% AEP
1% 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
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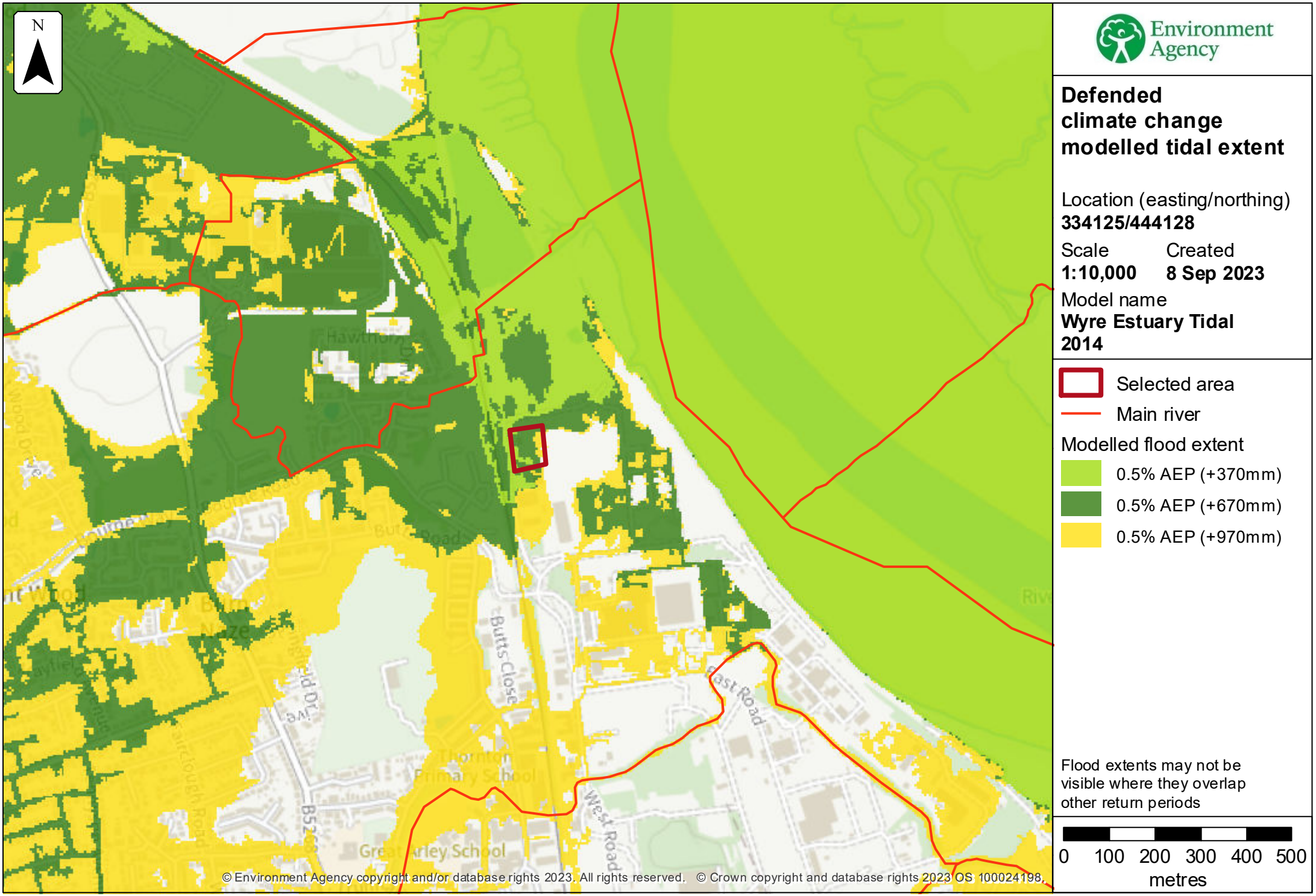
N
Environment Agency
Defended climate change modelled tidal extent
Location (easting/northing)
334125/444128
Scale
1:10,000
Created
8 Sep 2023
Model name
Wyre Estuary Tidal 2014
Selected area
Main river
Modelled flood extent
0.5% AEP (+370mm)
0.5% AEP (+670mm)
0.5% AEP (+970mm)
Flood extents may not be visible where they overlap other return periods
0 100 200 300 400 500
metres
Butts Close
West Road
East Road
Thornton Primary School
Great Carley School
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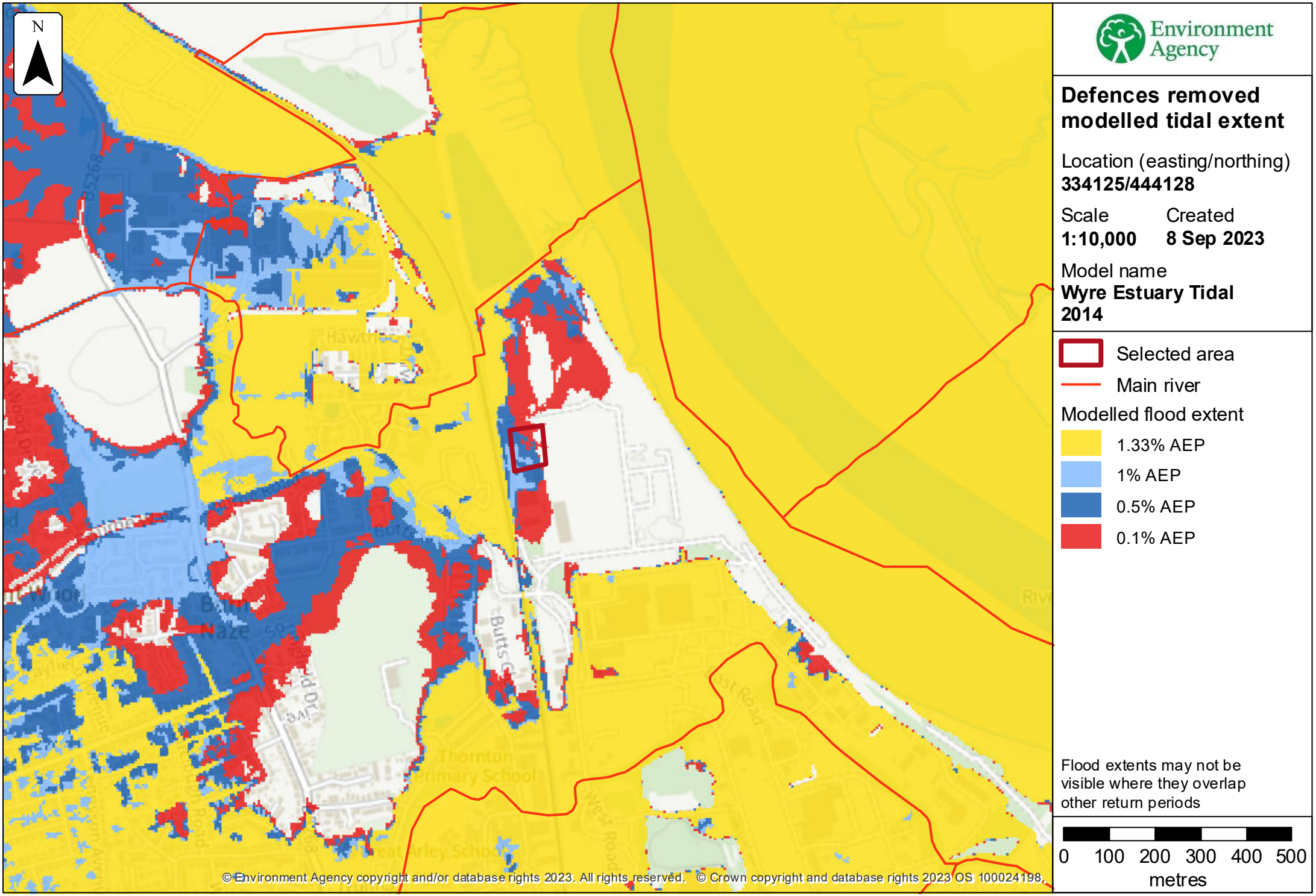
N
Environment Agency
Defences removed modelled tidal extent
Location (easting/northing)
334125/444128
Scale
1:10,000
Created
8 Sep 2023
Model name
Wyre Estuary Tidal 2014
Selected area
Main river
Modelled flood extent
1.33% AEP
1% AEP
0.5% AEP
0.1% AEP
Flood extents may not be visible where they overlap other return periods
0 100 200 300 400 500
metres
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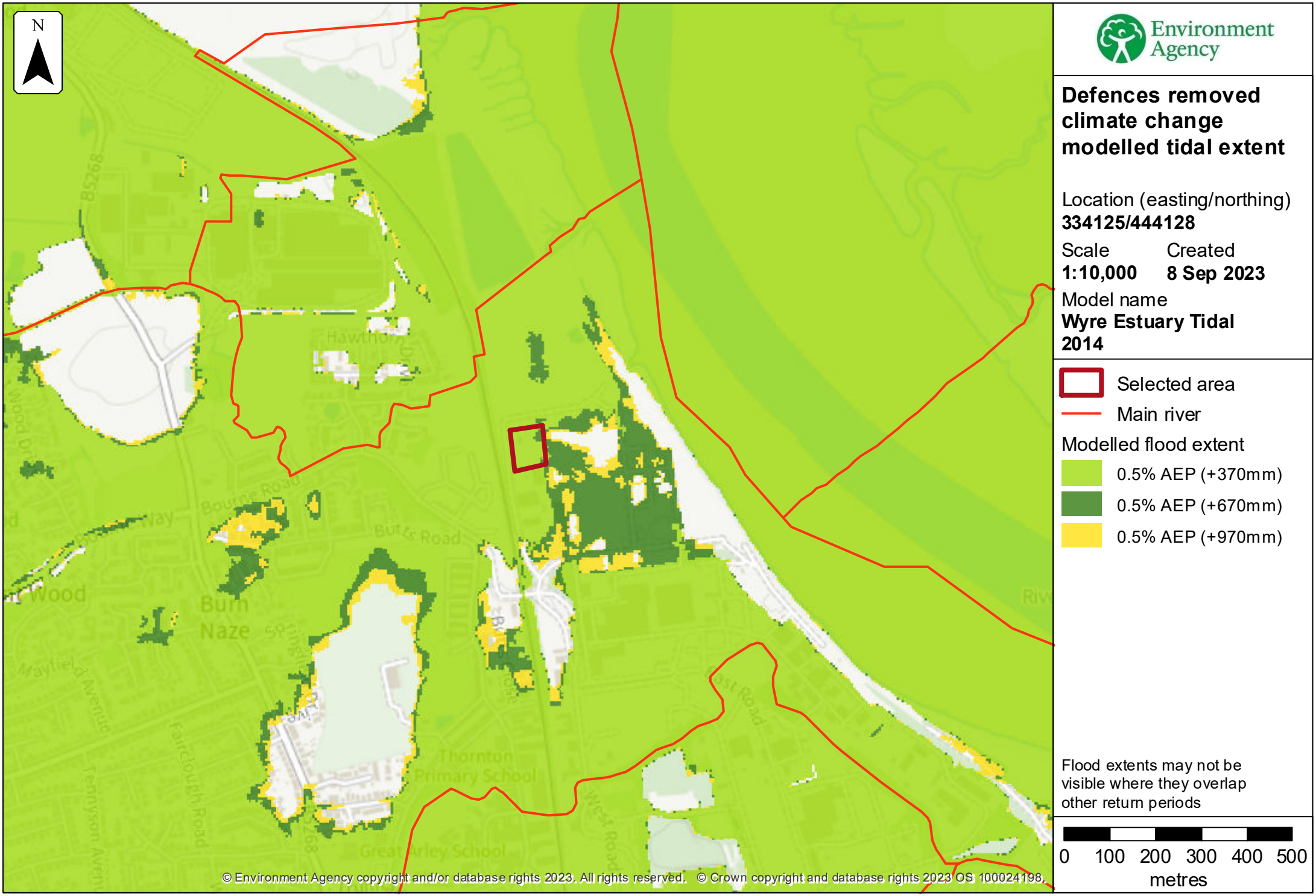
N
Environment Agency
Defences removed climate change modelled tidal extent
Location (easting/northing)
334125/444128
Scale
1:10,000
Created
8 Sep 2023
Model name
Wyre Estuary Tidal 2014
Selected area
Main river
Modelled flood extent
0.5% AEP (+370mm)
0.5% AEP (+670mm)
0.5% AEP (+970mm)
Flood extents may not be visible where they overlap other return periods
0 100 200 300 400 500
metres
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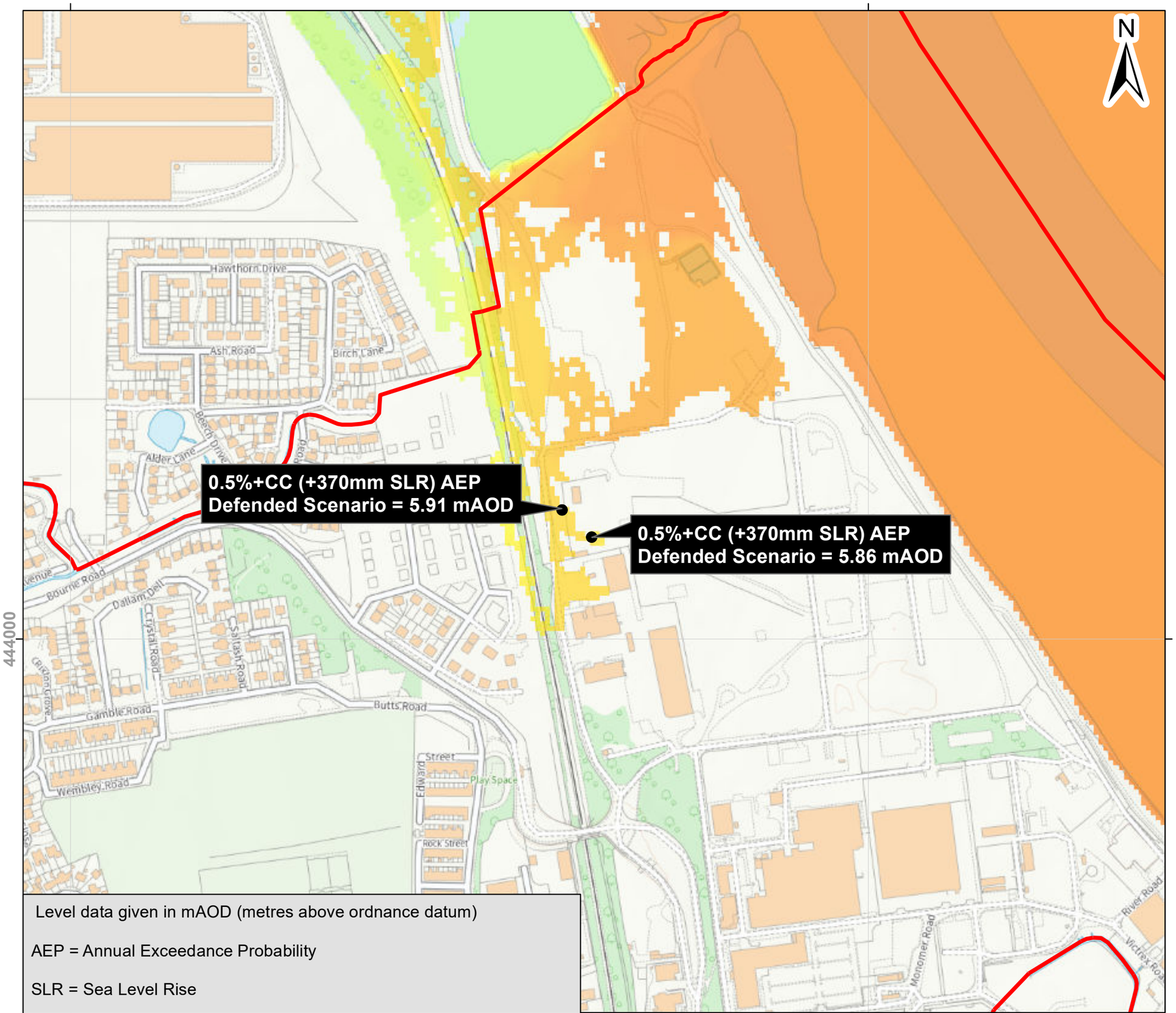


Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

SLR = Sea Level Rise

Environment Agency

Tidal Flood Levels Map:
Thornton-Cleveleys, FY5 4QD

Location (easting/northing)
334125 / 444128

Model Name
Lancashire Tidal ABD 2014
Produced: 28/09/2023

Key

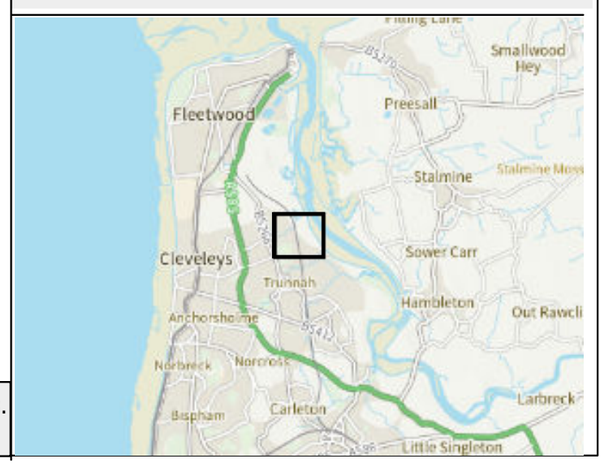
Statutory Main Rivers

0.5%+Climate Change (+370mm SLR) Annual Exceedance Probability Defended Scenario

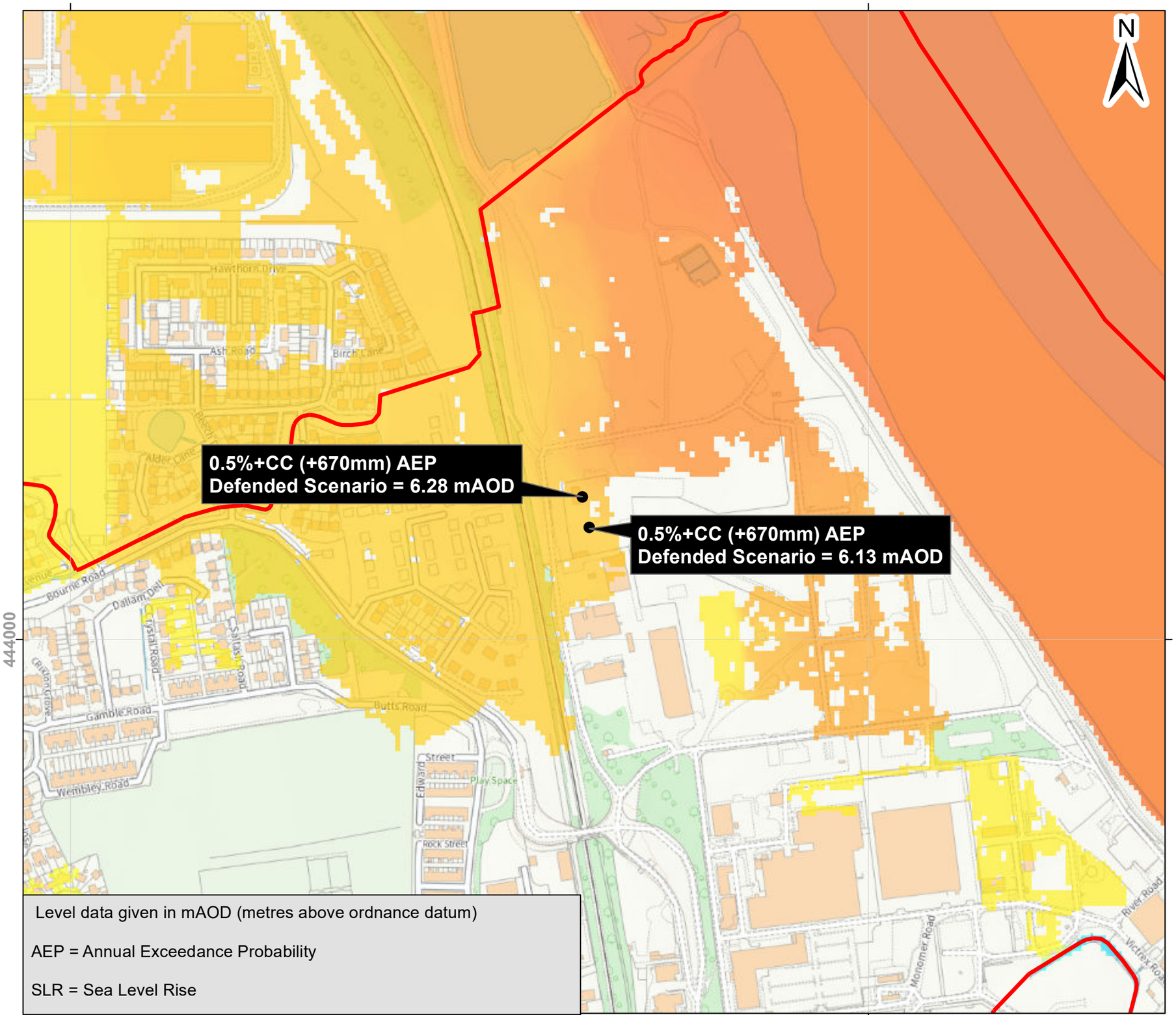
mAOD

High : 8

Low : 0



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



Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

SLR = Sea Level Rise

Environment Agency

Tidal Flood Levels Map:
Thornton-Cleveleys, FY5 4QD

Location (easting/northing)
334125 / 444128

Model Name
Lancashire Tidal ABD 2014
Produced: 28/09/2023

Key

Statutory Main Rivers

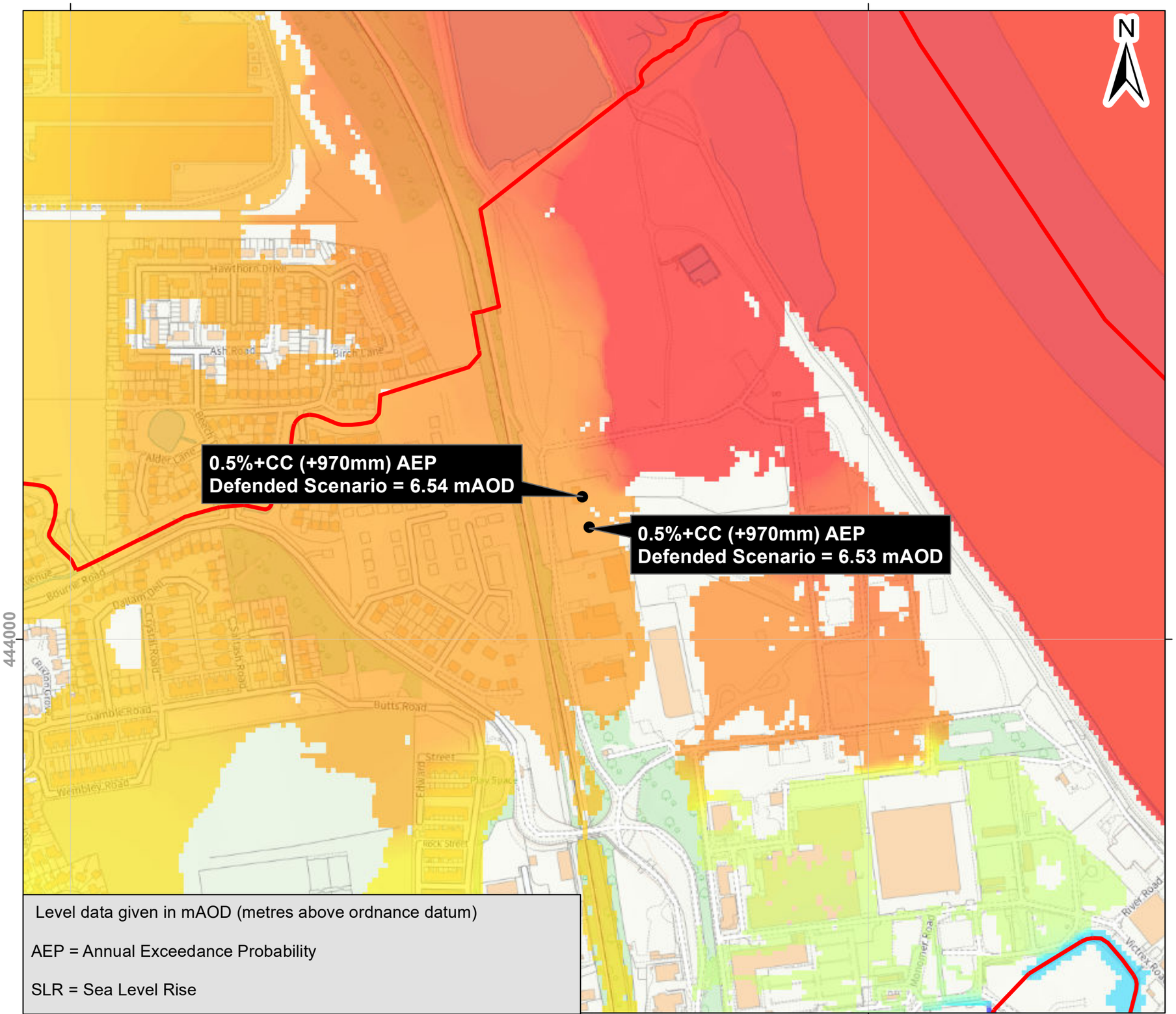
0.5%+Climate Change (+670mm SLR) Annual Exceedance Probability Defended Scenario

mAOD

High : 8

Low : 0

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



Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

SLR = Sea Level Rise

Environment Agency

Tidal Flood Levels Map:
Thornton-Cleveleys, FY5 4QD

Location (easting/northing)
334125 / 444128

Model Name
Lancashire Tidal ABD 2014
Produced: 28/09/2023

Key

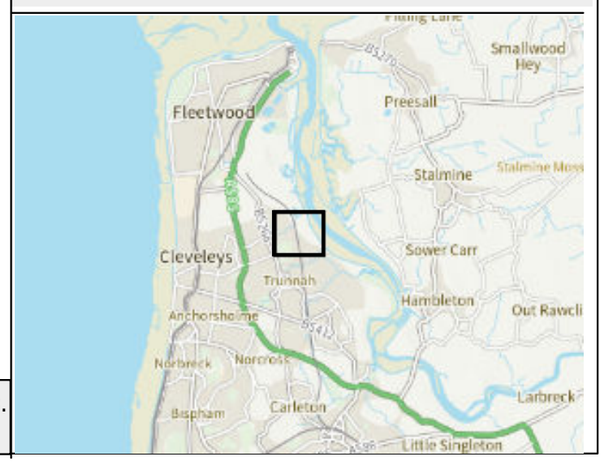
Statutory Main Rivers

0.5%+Climate Change (970mm SLR) Annual Exceedance Probability Defended Scenario

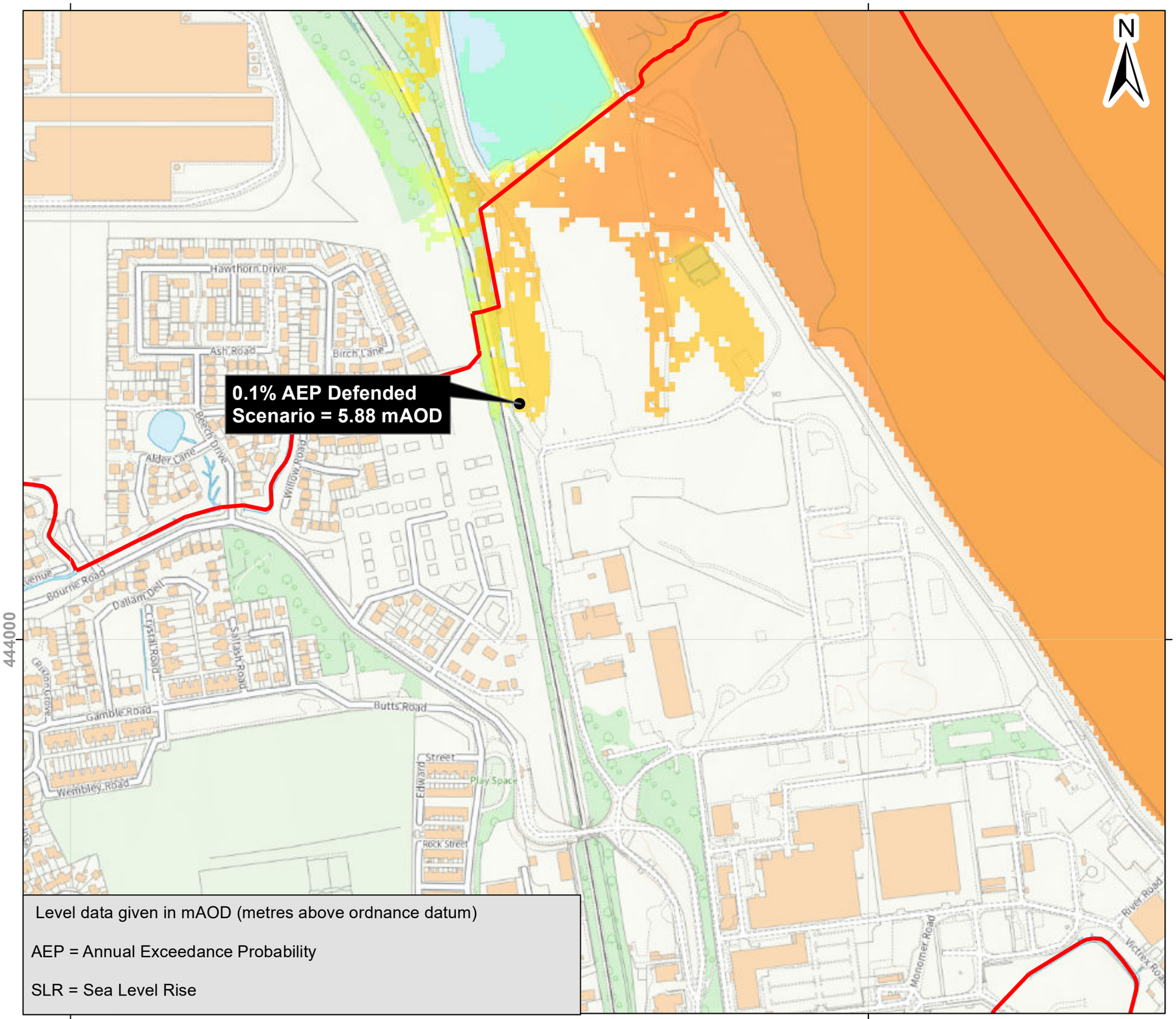
mAOD

High : 7

Low : 4



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



Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

SLR = Sea Level Rise

Environment Agency

Tidal Flood Levels Map:
Thornton-Cleveleys, FY5 4QD

Location (easting/northing)
334125 / 444128

Model Name
Lancashire Tidal ABD 2014
Produced: 28/09/2023

Key

Statutory Main Rivers

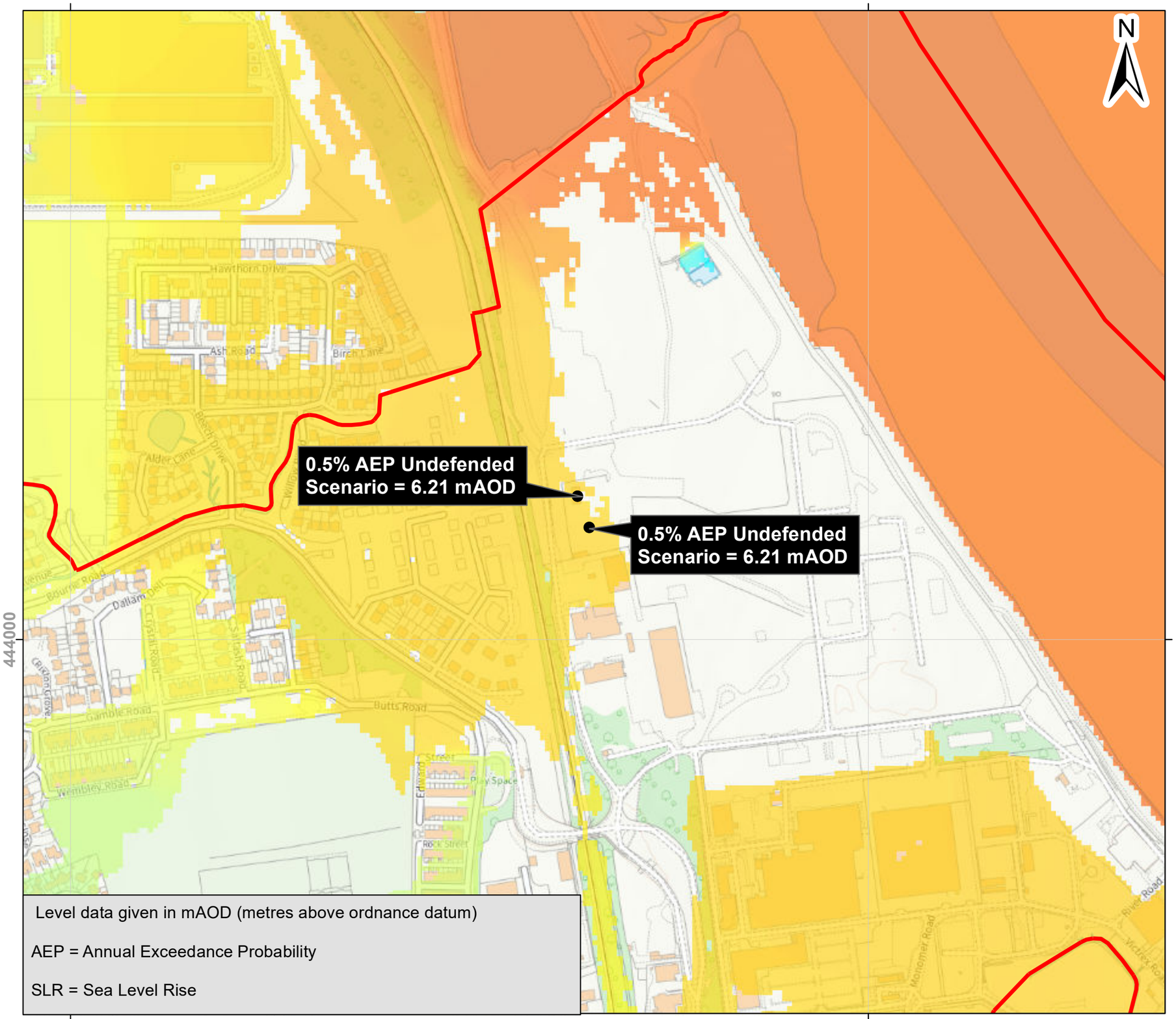
0.1% Annual Exceedance Probability Defended Scenario

mAOD

High : 8

Low : 0

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



Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

SLR = Sea Level Rise

Environment Agency

Tidal Flood Levels Map:
Thornton-Cleveleys, FY5 4QD

Location (easting/northing)
334125 / 444128

Model Name
Lancashire Tidal ABD 2014
Produced: 28/09/2023

Key

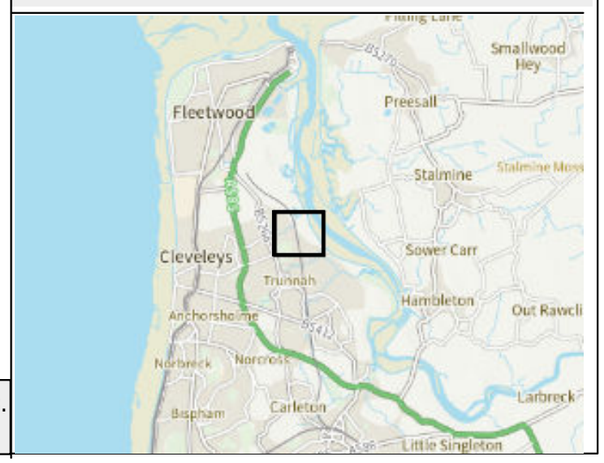
Statutory Main Rivers

0.5% Annual Exceedance Probability Undefended Scenario

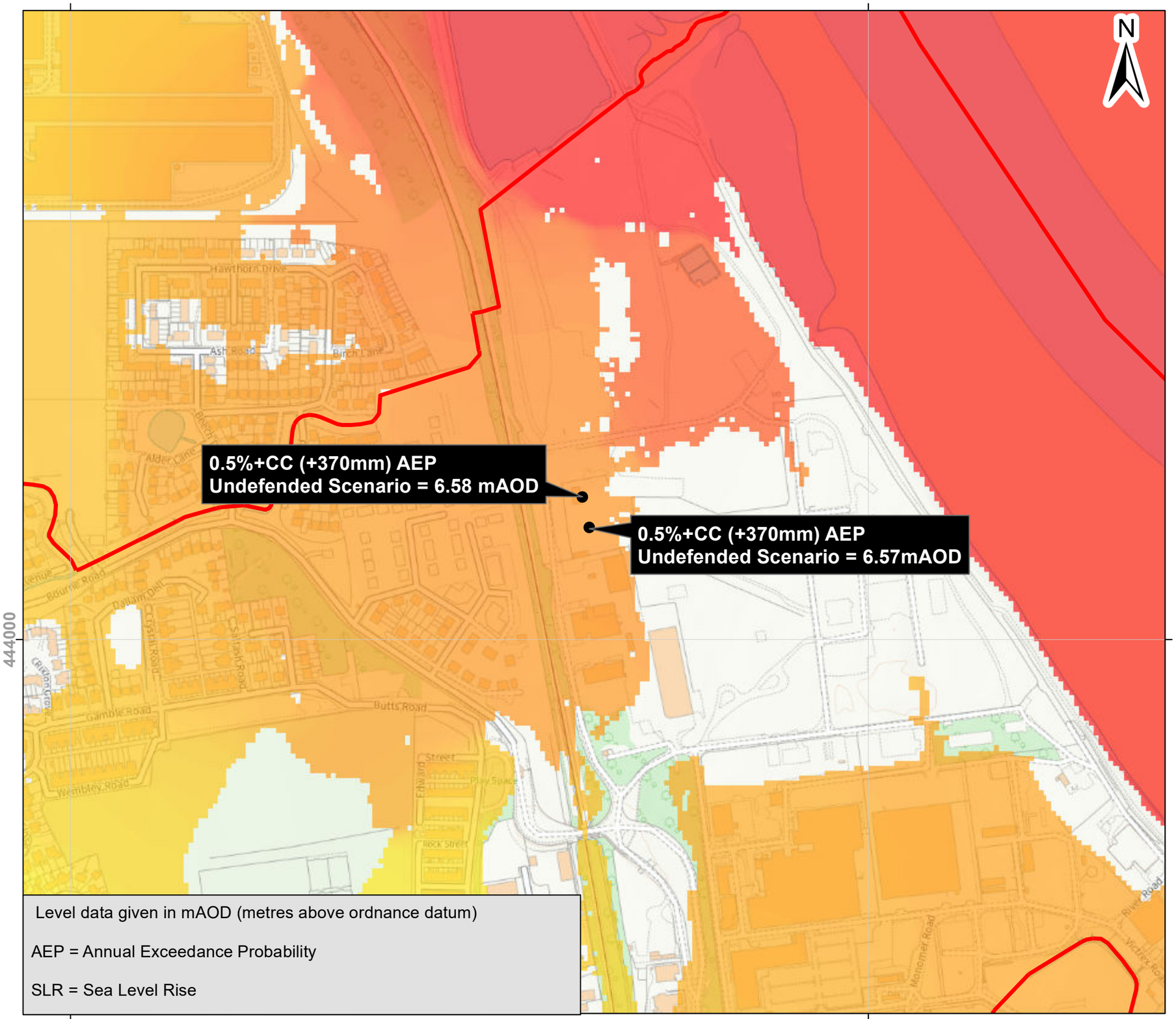
mAOD

High : 7

Low : 4



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



Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

SLR = Sea Level Rise

Environment Agency

Tidal Flood Levels Map:
Thornton-Cleveleys, FY5 4QD

Location (easting/northing)
334125 / 444128

Model Name
Lancashire Tidal ABD 2014
Produced: 28/09/2023

Key

Statutory Main Rivers

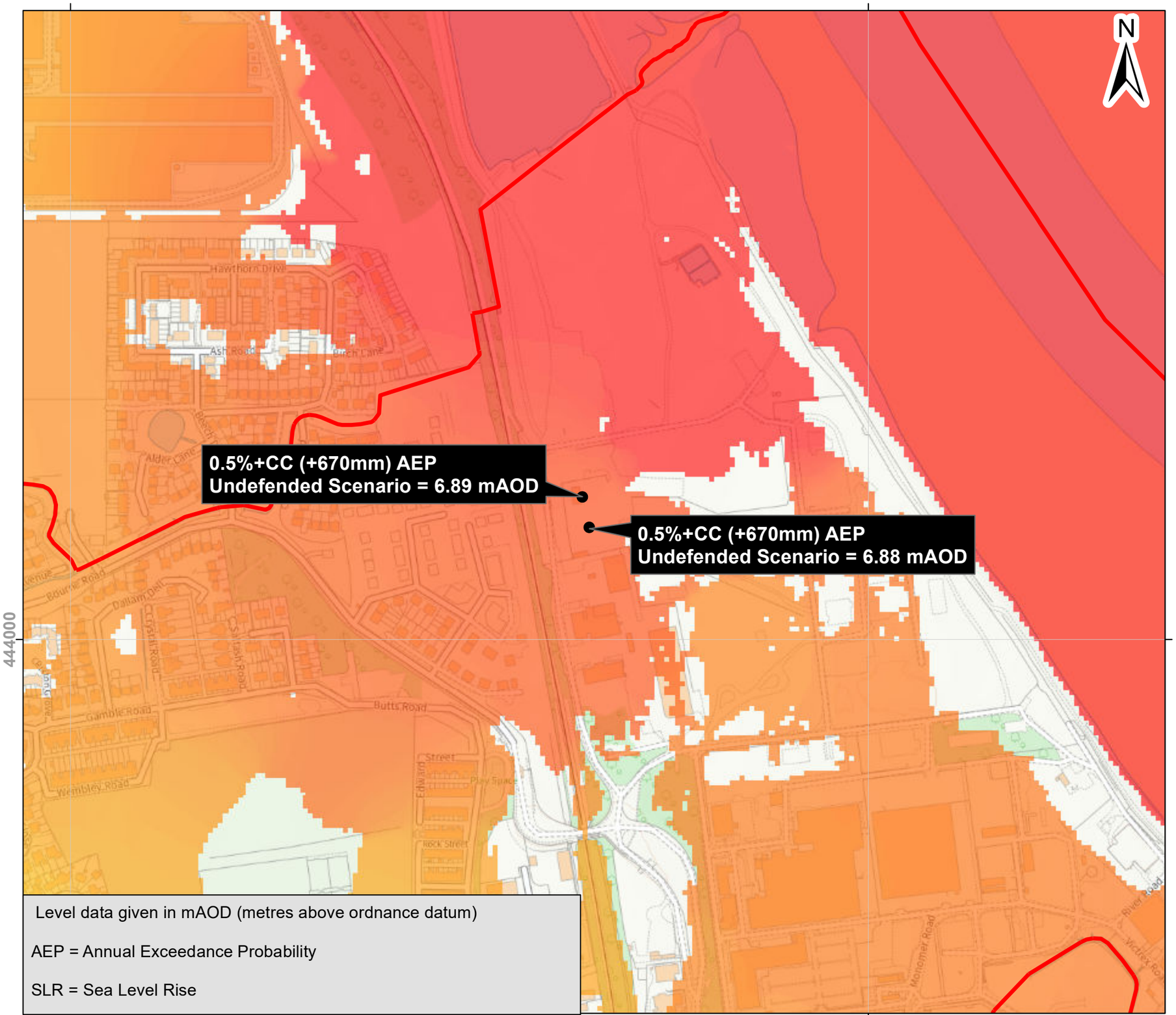
0.5%+Climate Change (370mm SLR)
Annual Exceedance Probability
Undefended Scenario

mAOD

High : 7

Low : 4

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



Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

SLR = Sea Level Rise

Environment Agency

Tidal Flood Levels Map:
Thornton-Cleveleys, FY5 4QD

Location (easting/northing)
334125 / 444128

Model Name
Lancashire Tidal ABD 2014
Produced: 28/09/2023

Key

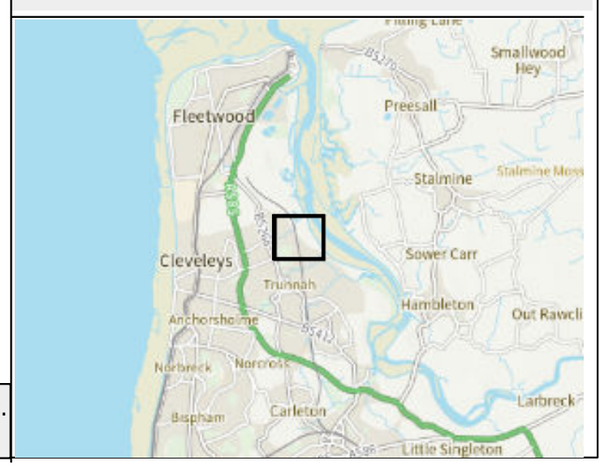
Statutory Main Rivers

0.5%+Climate Change (670mm SLR)
Annual Exceedance Probability
Undefended Scenario

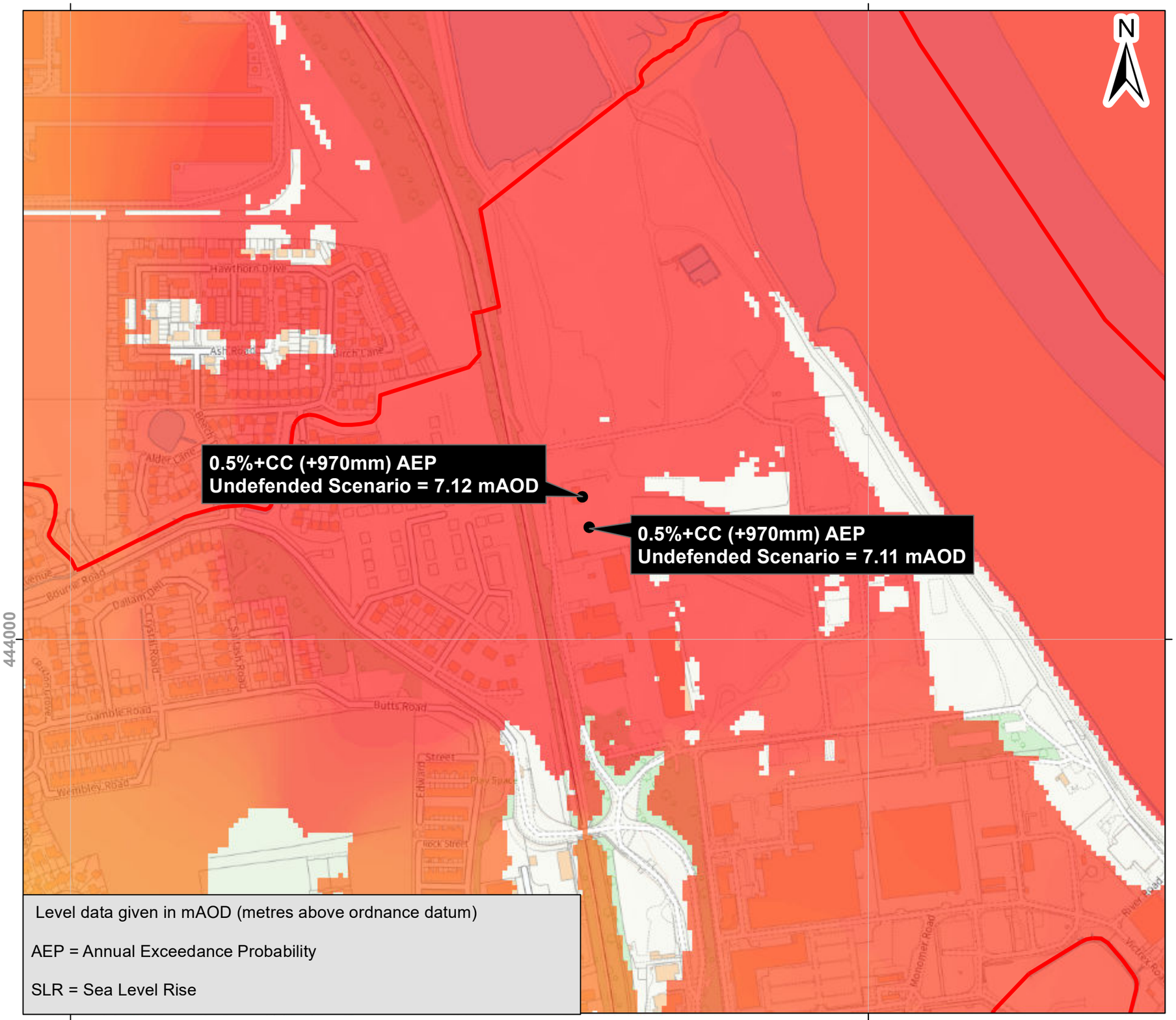
mAOD

High : 7

Low : 4



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



Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

SLR = Sea Level Rise

Environment Agency

Tidal Flood Levels Map:
Thornton-Cleveleys, FY5 4QD

Location (easting/northing)
334125 / 444128

Model Name
Lancashire Tidal ABD 2014
Produced: 28/09/2023

Key

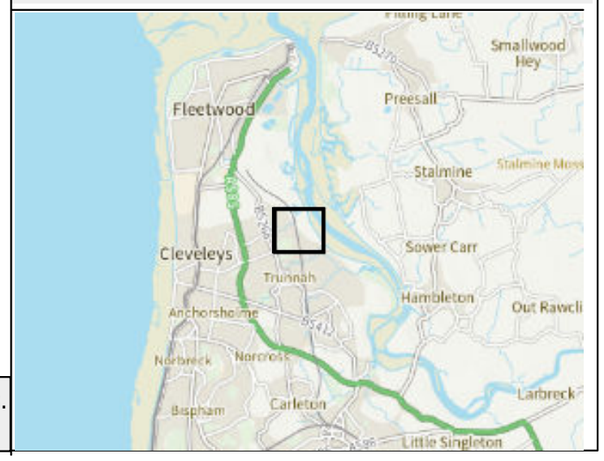
Statutory Main Rivers

0.5%+Climate Change (970mm SLR) Annual Exceedance Probability Undefended Scenario

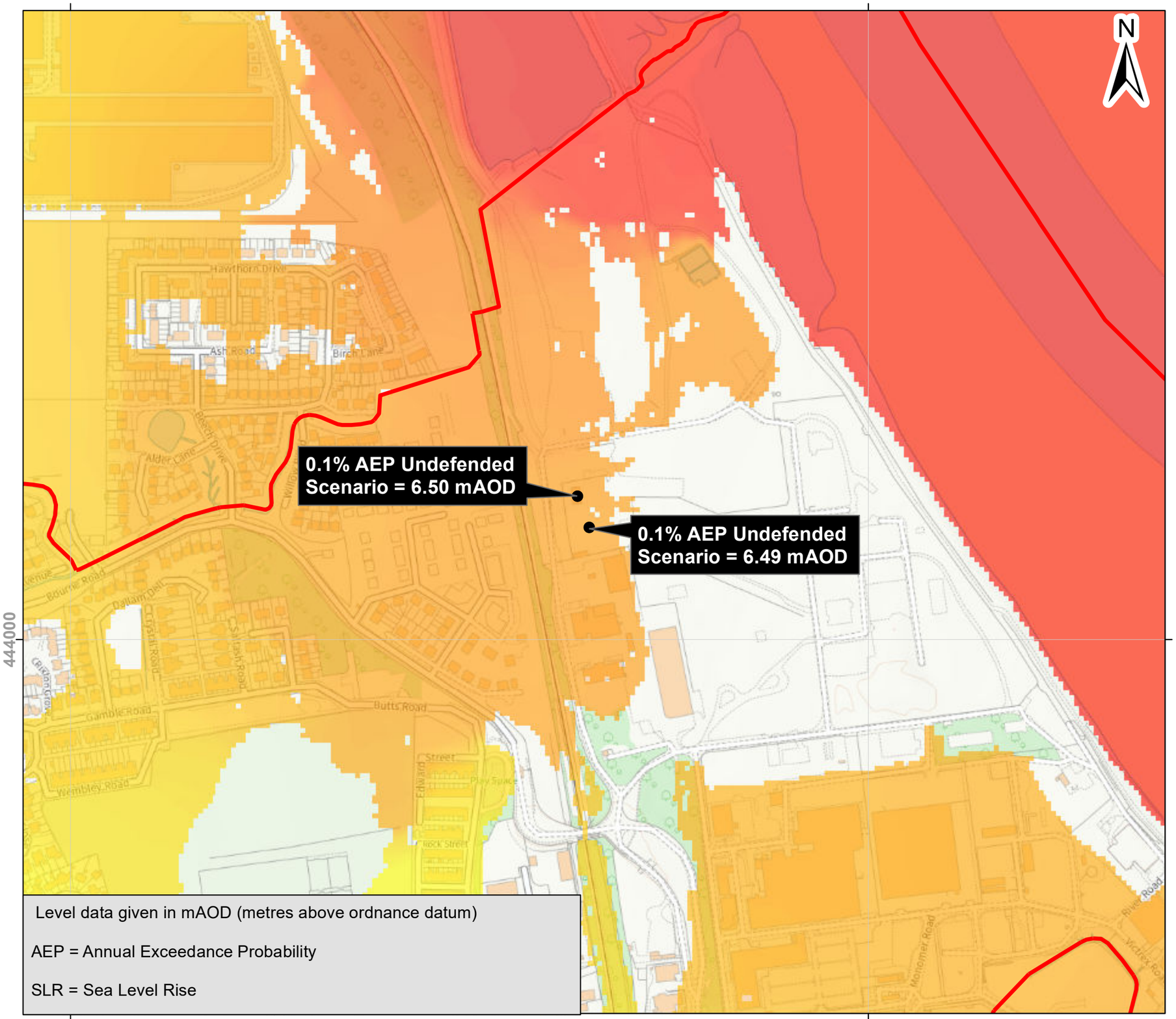
mAOD

High : 7

Low : 4



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



Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

SLR = Sea Level Rise

Environment Agency

Tidal Flood Levels Map:
Thornton-Cleveleys, FY5 4QD

Location (easting/northing)
334125 / 444128

Model Name
Lancashire Tidal ABD 2014
Produced: 28/09/2023

Key

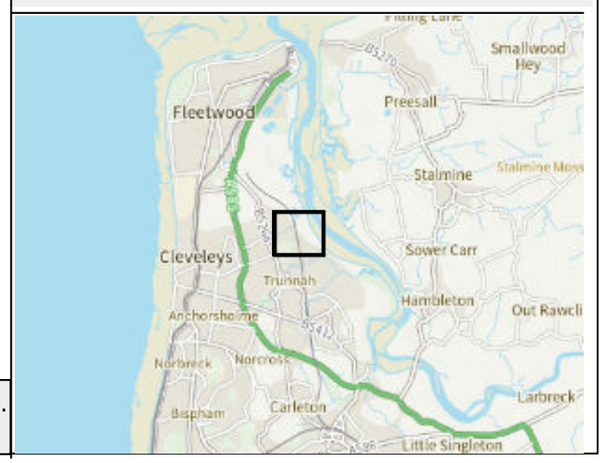
Statutory Main Rivers

0.1% Annual Exceedance Probability Undefended Scenario

mAOD

High : 7

Low : 4



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

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 Cumbria and Lancashire Environment Agency team at inforequests.cmblnc@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

APPENDIX 5
FLOOD WARNING & EVACUATION PLAN

Keystone
Design Associates Ltd.

Flood Warning & Evacuation Plan

LAND OFF HILL HOUSE INDUSTRIAL ESTATE, THORNTON-CLEVELEYS

October 2023

Development House
261 Church Street
Blackpool
FY1 3PB
Tel: 01253 649040
Fax: 01253 752901
Email: info@keystonedesign.co.uk

CONTENTS

1. Introduction
2. Objectives
3. Description of the Site
4. Key Points from Flood Risk Assessment
5. Preparation
6. Flood Warnings
7. Who to Inform & How
8. Action to be taken
9. Evacuation
10. Invacuation
11. Stand Down
12. Site Re-Occupation
13. Useful Sources of Information

Land off Hill House Industrial Estate, Thornton-Cleveleys

Flood Warning & Evacuation Plan

1.0 Introduction

This Flood Warning & Evacuation Plan (FWEP) has been produced by Keystone Design Associates Ltd in respect of the development for the erection of a commercial/industrial unit at land off Hill House Industrial Estate, Thornton-Cleveleys.

The FWEP captures a summary of the property's flood risk, taking into account flood mitigation measures incorporated in the design of the site and properties, and provides all relevant information, contact details and procedures to prepare for, respond to and recover from a flood event.

This is a plan to ensure the effective evacuation of land off Hill House Industrial Estate, Thornton-Cleveleys in the event of a flood.

2.0 Objectives

In the production of this FWEP Keystone Design Associates Ltd have identified the following key objectives:

- To ensure adequate ingress and egress for the emergency services & occupants; and
- Reduce the risk to life and damage to property.

3.0 Description of the Site

The development comprises of the erection of a commercial/industrial unit situated at land off Hill House Industrial Estate, Thornton-Cleveleys. The site is accessed directly off Bourne Street and lies within Flood Zone 2/3.

4.0 Key Points from Flood Risk Assessment

The development site lies within Flood Zone 2/3 of the Environment Agency Flood Map, Flood Zone 2 being the zone with risk of 1 in 100 year (1% AEP) and 1 in 1000 year (0.1% AEP) or less for fluvial flooding and Flood Zone 3 being the zone with risk of 1 in 100 year (1% AEP) or less for fluvial flooding or 1 in 200 year (0.5% AEP) or less for tidal flooding..

5.0 Preparation

The works will be constructed in accordance with the FRA flood resistance requirements. A copy of this plan will be kept on-site throughout the life of the building.

6.0 Flood Warnings

The following action will be taken for each flood warning.

Warning	**Message**	***Timing***	***Action***
 **FLOOD ALERT**	**Flooding is possible.** **Be prepared.**	2 hours to 2 days in advance of flooding.	▪ Be prepared for flooding. ▪ Prepare a flood kit.
 **FLOOD WARNING**	**Flooding is expected.** **Immediate action required.**	Half an hour to 1 day in advance of flooding.	▪ Act now to protect your property. ▪ Block doors with flood boards or sandbags and cover airbricks and other ventilation holes. ▪ Move pets and valuables to a safe place. ▪ Keep a flood kit ready. ▪ Move any critical equipment and information to a safe location
 **SEVERE FLOOD WARNING**	**Severe flooding.** **Danger to life.**	When flooding poses a significant threat to life and different actions are required.	▪ Be ready should you need to evacuate from the property. ▪ Co-operate with the emergency services and call 999 if you are in immediate danger.

Warning Removed	**No further flooding is currently expected for your area.**	Issued when a flood warning is no longer in force.	▪ Flood water may still be around and could be contaminated. ▪ If you've been flooded, ring your buildings and contents insurance company as soon as possible.

7.0 Who to Inform and How

The Environment Agency's flood risk early warning system will contact Sid Hill Transport Ltd on 07742 110237. Sid Hill Transport Ltd has also signed up to the Environment Agency Flood Warning Scheme at https://www.gov.uk/sign-up-for-flood-warnings.

8.0 Action to be taken in the event of an Alarm Raised or Flood Warning received

1) If a flood warning is received:

a) Raise the alarm and evacuate the property to a point of safety above the flood, this is considered to be Poolfoot Farm, Butts Road, Thornton-Cleveleys, FY5 4HX.
b) Contact the Emergency Services (999) if necessary
c) If safe to do so, locate and turn off key services e.g. water, gas & electricity.
d) Following enquiries/assessment the house should either be invacuated, evacuated or stood down.

9.0 Evacuation

2) In the unlikely event that evacuation is required, with having received notice from the Environment Agency, evacuation to a point of safety Poolfoot Farm, Butts Road, Thornton-Cleveleys is necessary. If the site starts to flood whilst the property is occupied, immediate action is for all occupants to evacuate and contact the emergency services (999) and await rescue.

10.0 Invacuation

3) If warning has been received but the site has not yet started to flood and the property is occupied, immediate action is to invacuate to an area outside of the flood zone.

11.0 Stand Down

Following confirmation from the Environment Agency, the decision can be taken to stand down. In this eventuality, the property should return to normal following the agreed re-occupation procedure.

12.0 Site Reoccupation

Site Reoccupation cannot be done initially following a flood due to contamination from flood water. The owners are to contact their insurers and complete a claim. It is envisaged that the owners insurance will lead to the reinstatement of the property, decontamination and arrange suitable alternative accommodation.

13.0 Useful Sources of Information

Am I at Risk of Flooding?
http://www.environment-agency.gov.uk/homeandleisure/floods/31650.aspx

Floodline Warnings Direct
https://fwd.environment-agency.gov.uk/app/olr/register

Prepare a Flood Plan for your Business
http://www.environment-agency.gov.uk/business/topics/flooding/32362.aspx

Business Flood Checklist
http://www.environment-agency.gov.uk/business/topics/flooding/32358.aspx

Make an Emergency Flood Plan for your Home
https://www.gov.uk/government/publications/personal-flood-plan

Preparing your home or business for flooding
http://www.environment-agency.gov.uk/homeandleisure/floods/31644.aspx

Improving the flood performance of new buildings: flood resilient construction.
http://www.communities.gov.uk/publications/planningandbuilding/improvingflood

Improving the flood resistance of your home - advice sheets
http://www.ciria.com/flooding/pdf/CIRIA_Advice_sheet_3.pdf

Flood Protection Association (Promote the interests of manufacturers and installers of flood protection equipment and requirements)
https://thefpa.org.uk/

Direct Gov Preparing for emergencies
https://www.gov.uk/government/publications/preparing-for-emergencies/preparing-for-emergencies

UK Resilience
http://www.cabinetoffice.gov.uk/ukresilience.aspx