



Flood Risk Assessment

At

6 Shellfield Road - Back
Southport
PR9 9UR

Client: DK - Architects
Reference: 33710-SUT-ZZ-00-RP-S-0002
Date: 20th February 2024


Liverpool Head Office
18-20 Harrington Street
Liverpool
L2 9QA


T: 0151 227 3155
E: enquiries@sutcliffe.co.uk
www.sutcliffe.co.uk


Manchester Office
T: 0161 817 5180

North Wales Office
T: 01978 664 071

London Office
T: 020 8016 4320

 [@Sutcliffe_1985](https://twitter.com/Sutcliffe_1985)

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Flood Risk Assessment

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Prepared by:

Name:	Matt Bowden
Title:	Graduate Civil Engineer
Qualifications:	IEng (MICE) (Hons)

Checked / Approved by:

Name:	Simon Brady
Title:	Associate
Qualifications:	BSc (Hons) MSc CEng MICE

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A	Oct 2023	Initial Issue	MB	SB	SB
B	Dec 2023	EA Comments	MB	SB	SB
C	Feb 2024	Floorplan Amendments	MB	SB	SB

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Flood Risk Assessment

1 Introduction

- 1.1 As part of the proposed development of 6 Shellfield Road, Southport it is necessary to prepare a site-specific flood risk assessment to ensure the flood risk is appropriately considered to protect people and property from flooding.
- 1.2 The development site area is 0.04 hectares and situated in Flood Zone 3 as defined by the Environment Agency.
- 1.3 This report will consider the flood risk to the site from all sources.
- 1.4 Sefton's guidance in relation to Sustainable Drainage and Flood requires that the flood risk assessment be proportional to the scale, type, and vulnerability of the development.
- 1.5 The proposed site plan is provided in Appendix A for reference.
- 1.6 The development site is located at the back of 6 Shellfield Road. The location data of the site is:

Post Code:	PR9 9UR		
Grid Reference:	SD 36042 19396		
Coordinates:	X: 336042	Y: 419396	
Latitude:	53°40'02"N	Longitude:	002°58'10"W
What3Words:	body.attend.ruins		

Table 1: Development Location Data



Figure 1 – Site Boundary

- 1.7 Flood risk information for planning has been obtained from the Environment Agency (EA) website and is provided in Appendix B. The EA data confirms the site falls within Flood Zone 3.

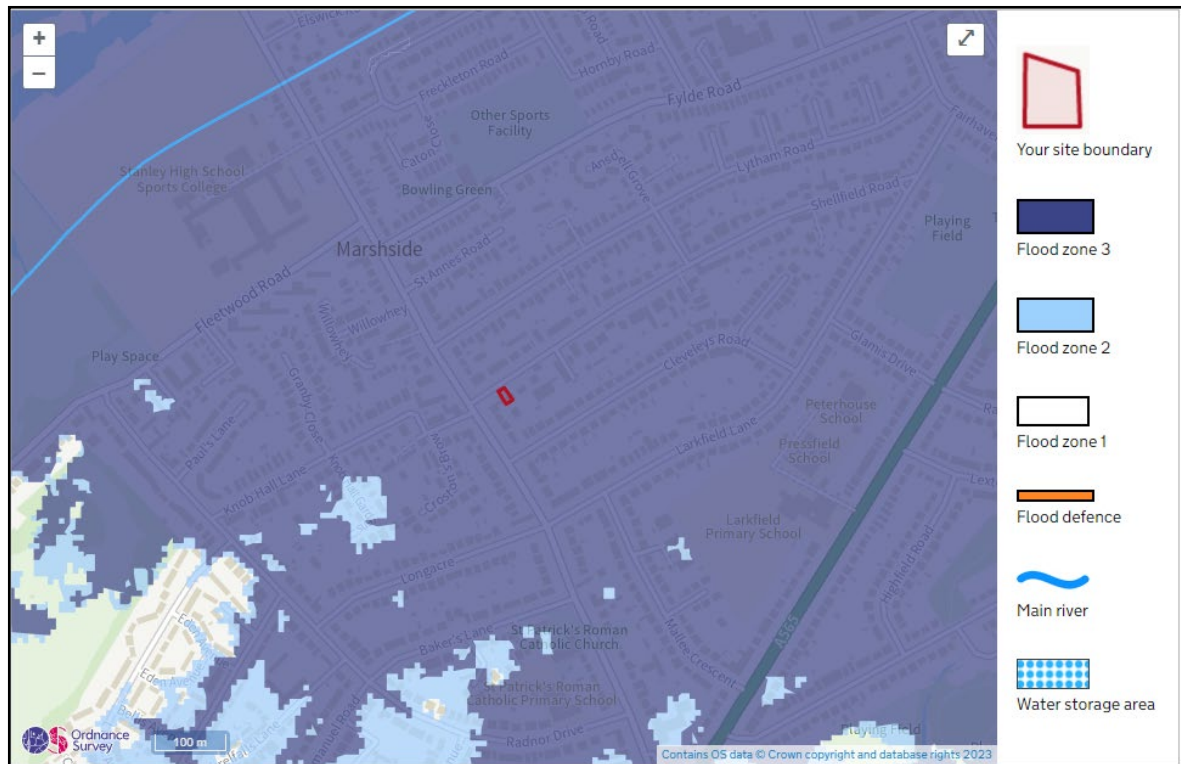


Figure 2 – Environment Agency Flood Map for Planning

- 1.8 The existing site is located along Shellfield Road, the back property is an existing office/warehouse.

2 Planning Context

- 2.1. The National Planning Policy Framework expects local planning authorities to protect people and property from flooding. In fulfilling their duty local planning authorities are to ensure the following steps are followed prior to granting planning permission:

- Assess flood risk
 - o The LPA must undertake a Strategic Flood Risk Assessment to inform the local plan and identify development sites that are in areas of low flood risk.
 - o Sites greater than 1 hectare or in areas of flood risk must have a Site-Specific Flood Risk Assessment prepared.
- Avoid flood risk
 - o The LPA should apply the sequential test to, as far as practicable, locate development sites in area at the least risk of flooding, and if required carry out the exception test.
- Manage and mitigate flood risk
 - o Where alternative sites are not available the LPA should ensure that development is flood resilient and resistant, safe for the users over the development's lifetime and will not increase overall flood risk.
 - o LPAs and developers should manage flood risk through the inclusion of sustainable drainage techniques.

- 2.2. There is no general statutory duty on the Government to protect land or property against flooding. However, the Government recognises the need for action to be taken to safeguard the wider social and economic wellbeing of the country.

- 2.3. Landowners have the primary responsibility for safeguarding their land and others property against natural hazards such as flooding. Individual property owners and users are also responsible for managing the drainage of their land in such a way as to prevent, as far as is reasonably practicable, adverse impacts on neighbouring land.
- 2.4. Those proposing development are responsible for:
- Demonstrating that it is consistent with the NPPF.
 - Providing an assessment of:
 - Whether any proposed development is likely to be affected by flooding from any source.
 - Whether it will increase flood risk elsewhere.
 - The measures to deal with these effects and risks.
 - Satisfying the local planning authority that any flood risk to the development or additional risk arising from the proposal will be successfully managed with the minimum environmental effect.
 - Designs which reduce flood risk to the development and elsewhere, by incorporating sustainable drainage systems and where necessary flood resilience measures.
 - Identifying opportunities to reduce flood risk, enhance biodiversity and amenity and seek collective solutions to managing flood risk.

3 Catchment/Site Description

- 3.1. The topography of the site generally slopes from east to west. The maximum elevation is 5.59mAOD, the minimum elevation is 5.75mAOD. The topographic survey is included within the appendix for reference. The site levels can be summarised as follows:

	Ground Level (mAOD)
Min Elevation	5.59
Max Elevation	5.75
Mean Elevation	5.67

Table 2: Site Elevation Summary

- 3.2. A review of grid reference finder confirms there are no open watercourses near the development site, an extract of the Map is in figure 3.
- 3.3. The site is identified in the Local Plan as being within policy area HC3 (primary residential area).
- 3.4. The existing FFL is 5.64mAOD.



Figure 3: Existing Watercourse. (Source: OS Map; <https://gridreferencefinder.com>)

- 3.5. The British Geological Survey (BGS) Geology of Britain viewer defines the superficial geology as Tidal flat deposits and bedrock geology consists of Singleton Mudstone Member.
- 3.6. The National Soils Resources Institute, through the Soilscape web viewer, identify the soil type as Soilscape 15, Naturally wet very acid sandy and loamy soils that drain to Shallow groundwater.

4 Flood Risk Assessment

- 4.1.1 The National Planning Policy Framework (NPPF) seeks to promote development in areas at low risk of flooding and to reduce the flood risk resulting from development. The purpose of this site-specific flood risk assessment is to demonstrate that the site can be considered to fall within an area of low annual probability and assess the risk to the site from all sources of flooding.
- 4.1.2 The planning flood maps from the Environment Agency confirm that the site is in Flood Zone 3 due the risk posed by sea flooding. The Environment Agency flood map also indicates that the site benefits from sea defences.

- 4.1.3 A review of Table 3 of the NPPF Technical guide indicates that an exception test is required to confirm whether or not the site is suitable for development that falls within all the more vulnerable classification.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	*	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	*	*	*

Key: ✓ Development is appropriate.
 * Development should not be permitted.

Figure 4: Table 3 from the NPPF Technical Guide illustrating site classification.

- 4.2 The Sequential Test
- 4.2.1 In accordance with the NPPF it is required to apply the sequential test at all stages of the planning process.
- 4.2.2 The aim of this process is to steer new developments to areas at the lowest probability of flooding (Zone 1).
- 4.2.3 The Environment Agency's flood zones are the starting point for applying the sequential test. The zones refer to flooding from sea and river flooding only.
- 4.2.4 The site is a brownfield site situated within an urban area and there are no suitable and available alternative sites.
- 4.2.5 The site levels are to remain at their current level as the FFL is constrained by the property being a part of an existing office. Flooding is not exacerbated through the redevelopment of the building as no flood water is displaced by the proposal and no additional surface runoff is created over the existing condition.
- 4.2.6 The probability of flooding from all potential sources will be assessed and proposals will be put forth in the conclusions to ensure the development complies with flooding guidance.

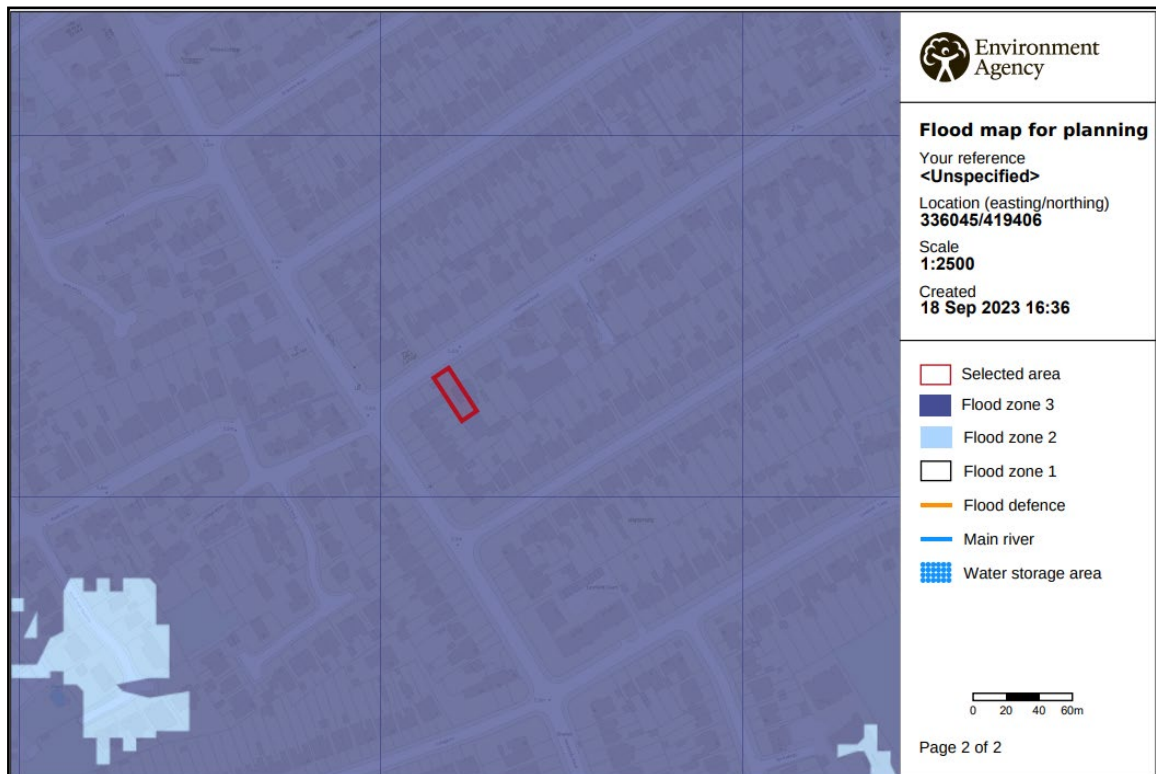


Figure 5: Environment Agency Flood Map for Planning

- 4.2.7 The proposed development does not meet the requirements of the Sequential Test as the proposed development is in flood zone 3. However, it is an existing office/warehouse so the development cannot be relocated to a lower flood zone area.
- 4.3 The Exception Test
- 4.4.1 The following requirements of the exception test must be satisfied to consider the development acceptable:
- development that has to be in a flood risk area will provide wider sustainability benefits to the community that outweigh flood risk;
 - the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
- 4.4.2 In accordance with Paragraph 36 of the Flood Risk and Coastal Change Practice Guide, the reuse of a brownfield site fulfils the requirement of providing wider sustainability benefits to the community.
- 4.4.3 The development satisfies Paragraph 36 by redeveloping brownfield land, through the reuse of an existing building, rather than developing a greenfield site.
- 4.4.4 The Environment Agency Defended Climate Change Model demonstrates that the site is protected by flood defences making the site safe for development. The proposal does not increase flood risk elsewhere as flood water are not displaced and there is no increase in impermeable area as result of the development.
- 4.4.5 The development can be considered to provide sustainability to the community by providing housing in a residential area by reverting to the original use of the premises.
- 4.4.6 As required by the exception test the proposed development is on a brownfield site, the existing building is retained and redeveloped.

- 4.4.7 A review of the local area confirms there are no reasonably available brownfield sites outside the area benefiting from flood defences as the majority of Southport, north of Cambridge Road, is within the defend coastal flood zone.
- 4.4.8 The inclusion of SuDS drainage principles as required by the LLFA and discharge hierarchy will reduce surface water runoff from the development and lessen overall flood risk.
- 4.5 Sources of Flooding
- 4.5.1 Flooding is a natural hazard and can happen at any time in a wide variety of locations. There are several forms of flooding, which present a range of different risks. The speed of inundation and the duration of different forms of flooding vary greatly. With climate change, the frequency, patterns, and severity of flooding are forecast to change and become more damaging.
- 4.5.2 The limits of flood risk areas cannot be defined precisely because floods with similar probability can arise from different combinations of weather, sources, rainfall patterns, local topography, and patterns of development.
- 4.5.3 Every flood will have different consequences on people, property and the environment and depends on the land use.
- 4.5.4 Flooding from rivers or the sea is classed as a very low risk for the development site as seen in figure 6 below.

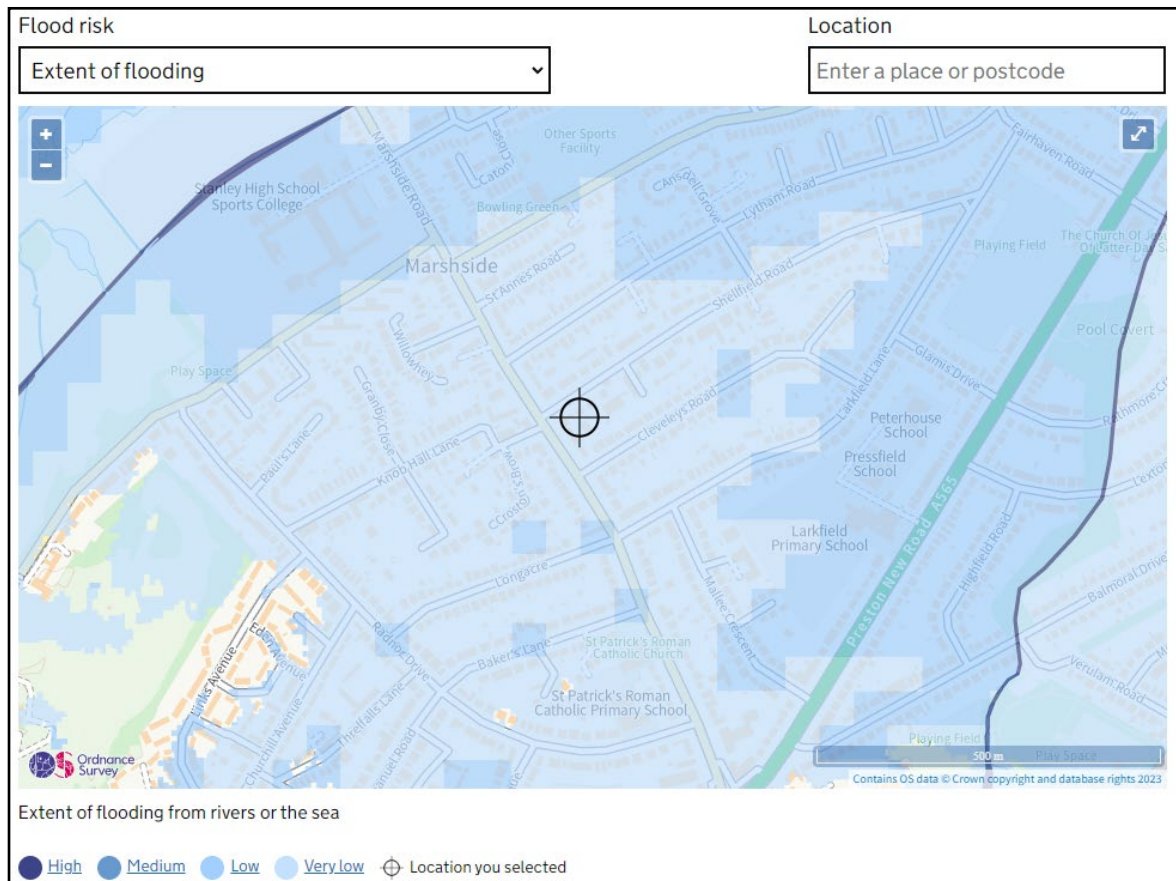


Figure 6: Environment Agency Flood Map for Extent of flooding from rivers or the sea.

- 4.5.5 Flooding from surface water may occur in times of intense rainfall at a local site level as any drainage system may not be able to disperse the rainfall quickly enough. Surface flooding occurs when both the natural interception capacity of the ground is exceeded and the capacity of inlets to the drainage system are exceeded.

- 4.5.6 The Environment Agency provides surface water flood maps for the high (greater than 3.3% AEP), medium (1% AEP) and low (0.1% AEP) risk scenarios. All the surface water flood maps from the Environment Agency website are provided in Appendix B for reference, although the low-risk scenario is generally considered above the design return period.
- 4.5.7 The Environment Agency cautions that due to the limitations within the model (single drainage rate, national level modelling, LiDAR data etc.) the surface water flood maps do not provide a definitive risk of surface water flooding at the plot level. The following assessment reflects the current scenario and provides an indication of the potential surface water flood risk in the absence of drainage network designed to facilitate the proposed development through the management of surface water.
- 4.5.8 The extent of surface water flooding, Figure 7, indicates that there is a small risk of surface water flooding occurring within the site boundary. The surface water flood risk is shown occurring at several isolated spots within the site in areas in front of the front property. The isolated flooding only occurs for the 0.1% AEP event.



Figure 7: Environment Agency Extent of Surface Water Flooding Map

- 4.5.9 The risk of surface water flooding to the development can be mitigated by implementing a surface water management strategy that safely manages rainfall events to the required standard and careful consideration of finished floor levels.
- 4.5.10 Following implementation of the mitigation measures the risk of surface water flooding to the site can be considered to be low.
- 4.6 Coastal Flooding
- 4.6.1 The site is within an area at risk of coastal flooding.

The Environment Agency has provided details for the flood defences in the vicinity of the site. The full record is provided in the appendix, the nearest defences are summarised on Table 1. The crest level of the defences, nearest the site, are noted as 6.40-6.45m AOD.

The site is defended by embankment flood defences that have been designed to offer flood protection up to the 1:150-year return period event.

Flood model data provided by the Environment Agency confirms the coastal flood levels noted in Table 2.

Asset Ref.	National Grid Reference	Asset Type	Design Standard (Return Period, years)	Effective Crest Level (mAOD)
012KB90060301C04	SD 36426 20457	Embankment	150 (0.667% AEP)	6.40
012KB90060301C03	SD 34774 19072	Embankment	150 (0.667% AEP)	6.45

Table 3: Environment Agency Coastal Defences (CL77492)

Annual Exceedance Probability	Flood Level (mAOD)	FFL Level (mAOD)	Depth (mAOD)
0.5% Undefended AEP	6.04	5.64	-0.4
0.5%+CC (370mm) Undefended AEP	6.40	5.64	-0.76
0.5%+CC (670mm) Undefended AEP	6.79	5.64	-1.15
0.5%+CC (970mm) Undefended AEP	6.98	5.64	-1.34
0.1% Undefended AEP	6.26	5.64	-0.62

Table 4: Flood Levels from Tidal ABD 2014 Study (Environment Agency)

The EA flood map for planning classifies the site to be in an area of very low risk of flooding from the sea. This is due to the site being defended.

Following correspondence with the Environmental Agency, site has been modelled with defence and without and they have confirmed that the site is not at risk as its inside the defended flood zone (seen below).

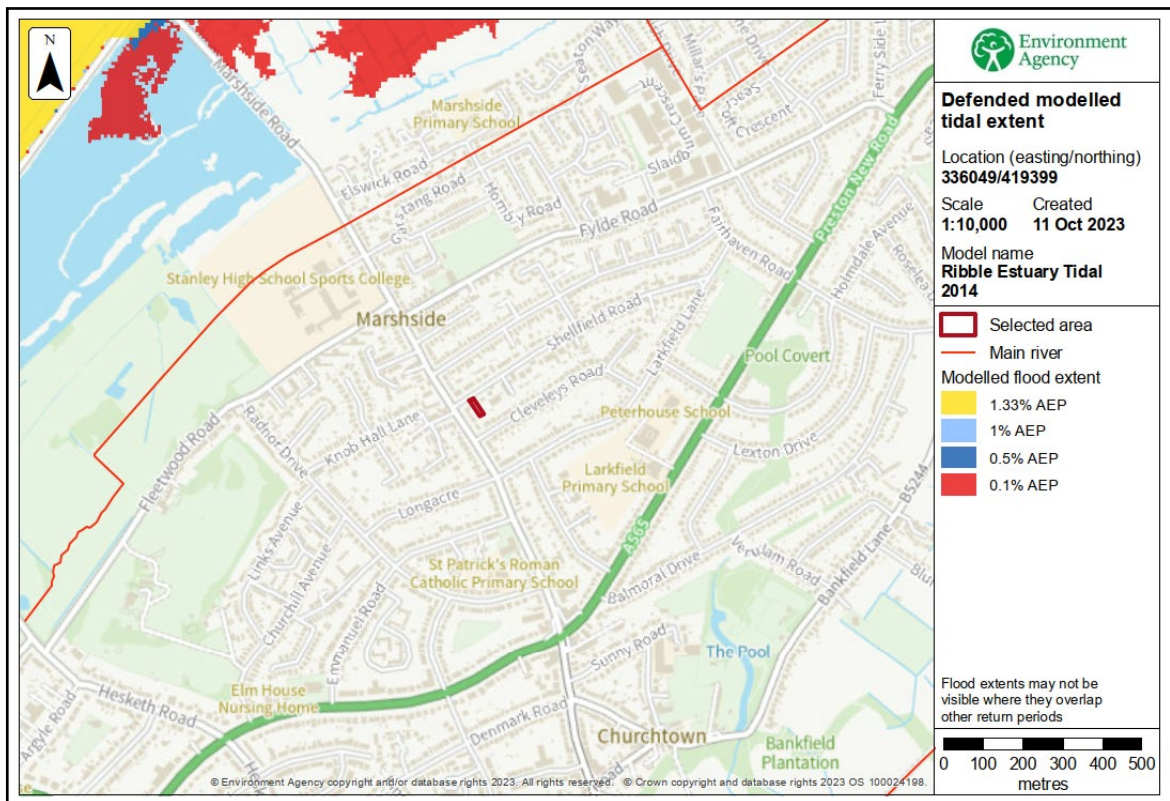


Figure 8: Environment Agency Defended modelled tidal extent.

Full Environmental agency correspondence in appendix D

4.7 Fluvial (River) Flooding

4.7.1 The site is not at risk of river flooding (Figure 9-1, Sefton Level 2 SFRA).

4.8 Flooding from Sewers

4.8.1 Flooding from the sewers occurs when surcharging during periods of excess flow breaks ground, typically at manholes or road gullies. The proposed development is not likely to increase the risk posed by sewer flooding as the surface water runoff, a primary cause of sewer surcharging, from the site is to be managed in accordance with the requirements of the NPPF, LLFA.

4.8.2 The Sefton Metropolitan Borough Council Level 2 Strategic Flood Risk Assessment (SFRA, December 2012), Figure 16-1, provides information on properties previously affected by sewer flooding; an extract of the figure is shown in Figure 9.

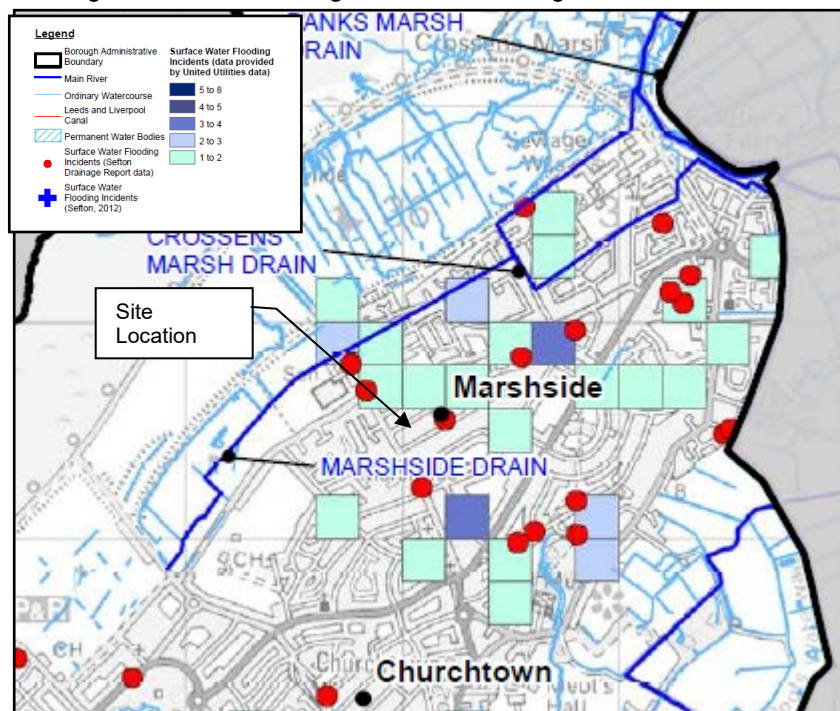


Figure 9: Extract of Figure 16-1, Sefton Level 2 SFRA (Sewer Flooding)

4.8.3 Extracts from the Public Sewer Record are included in the appendix for reference.

4.8.4 As the sewers are operated and maintained by United Utilities and the proposed drainage within the site will be designed to the current requirements of the LLLFA the site can be considered at low risk of sewer flooding.

- 4.8.5 Flooding from drains and sewers occurs when sewers surcharge and flows spring from manholes and inlets to the drainage system. Public sewers in the area are operated by United Utilities. The development area is served by separate sewage network, an extract from the public sewer record is shown in Figure 10, the complete record is provided in the appendix.

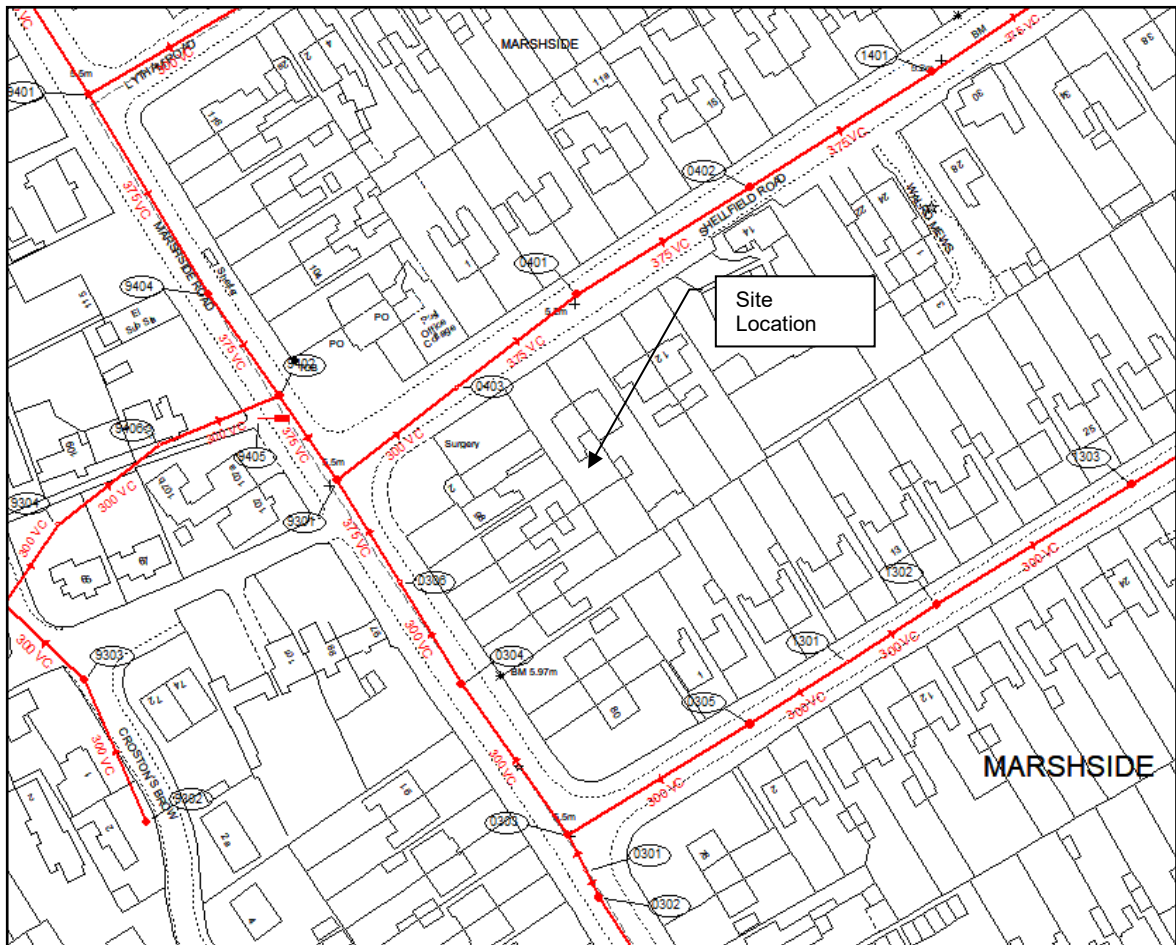


Figure 10: United Utilities Sewer Record Extract

- 4.8.6 The sewers in the development area range from 300mm to 375mm in diameter. The current water sewers flow from west to east long Shellfield Road in front of the development, towards the east where they connect with sewers flowing north towards the sewage works.
- 4.8.7 Drainage for the proposed development will be designed to current best practice for the foul sewers using Approved Document H. Where new surface water drainage for the site is proposed it shall be designed to cater for the 100-year plus climate change event in accordance with current guidance and will incorporate long-term storage and SuDS as appropriate.
- 4.8.8 Flooding from infrastructure occurs when canals, dams or other manmade structures capacity is exceeded, or they fail. The Environment Agency Flood Map for Planning confirms the site is not within a flood risk area for a reservoir.
- 4.8.9 There is not risk of flooding associated with infrastructure failure.
- 4.8.10 There are no other sources of flooding that affect the site. Overall flood risk to the proposed development can be considered low.
- 4.9 Flooding from Groundwater
- 4.9.1 The Sefton Metropolitan Borough Council Level 2 Strategic Flood Risk Assessment (SFRA, December 2012) concludes that groundwater flooding is a concern for certain part of the Borough.

4.9.2 Figure 17-1 of the SFRA confirms the site is in an area at low risk of ground water flooding, an extract of Figure 17-1 from the SFRA is shown in figure 11.

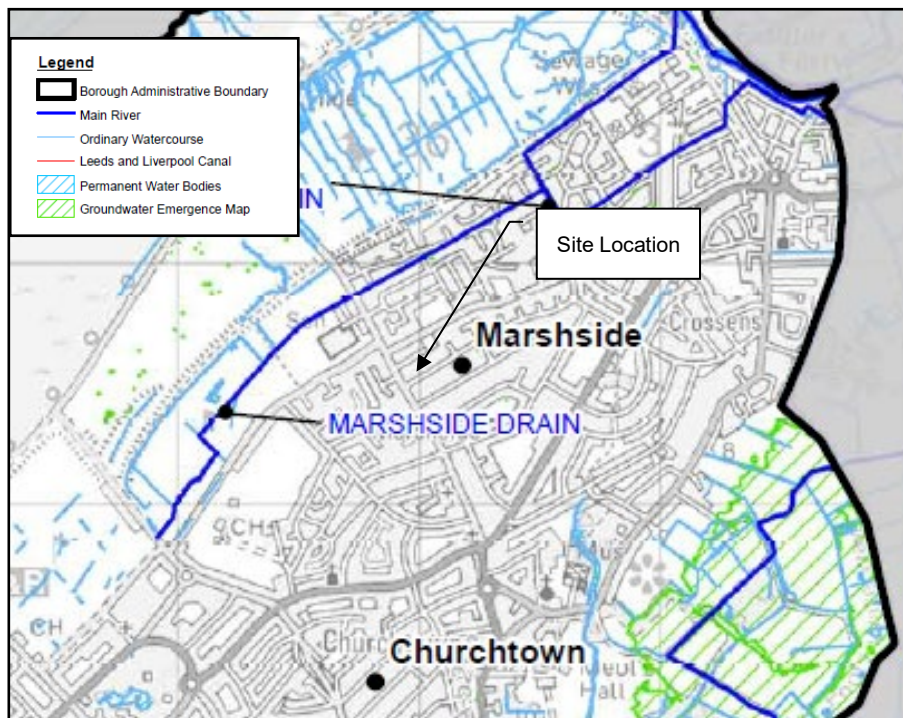


Figure 11: Extract of Figure 17-1, Sefton Level 2 SFRA (Groundwater Flooding)

4.9.3 The risk from groundwater flooding to the site can be considered low.

5 Climate Change

- 5.1 Paragraph 153 of the National Planning Policy Framework (NPPF) requires that plans should take a proactive approach to mitigating and adapting to climate change.
- 5.2 Paragraph 161 of the NPPF requires all plans to adopt a risk-based approach considering all sources of flood risk and future impacts of climate change.
- 5.3 To appropriately mitigate the increased flood risk caused by climate change the Government has published guidance (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>) related to the appropriate climate change allowances.

3.3% Annual Exceedance Rainfall Event		
Epoch	Central Allowance	Upper End Allowance
2050s	25%	35%
2070s	30%	40%
1% Annual Exceedance Rainfall Event		
Epoch	Central Allowance	Upper End Allowance
2050s	25%	40%
2070s	30%	45%

Table 5: Weaver Goway Management Catchment Peak Rainfall Allowances

5.4 For development with a lifetime between 2061 and 2125 the 2070s epoch data should be used.

North West		
Epoch	Central Allowance	Upper End Allowance
2000 to 2035 (mm)	158	200
2036 to 2065 (mm)	219	297
2066 to 2095 (mm)	300	426
2096 to 2125 (mm)	336	489

Table 6: Sea level allowances by river basin district for each epoch in mm for each year

5.5 As the project is residential the 2096 to 2125 sea level parameters are used.

5.6 To mitigate the impact of climate change on the development the upper end allowances should be considered for both the 1% and 3.3% annual exceedance probability events and the development should be design for the 1% annual exceedance probability event so that there is:

5.7 No increased flooding elsewhere.

5.7.1 As the proposed development reuses the existing building, there is no increase to the area meaning there is no additional flood area.

5.7.2 And the development is safe from surface water flooding.

5.8 Where new surface water drainage is proposed an allowance for climate change shall be included to mitigate the admitted risk.

6 Emergency Access/Escape

6.1 With flood risk to the site, from most sources, considered low except from the area being within a flood zone 3 for sea and rivers, the nature of flooding advanced warning would be possible so the residents should sign up for Environmental Agency and local flood warning alerts.

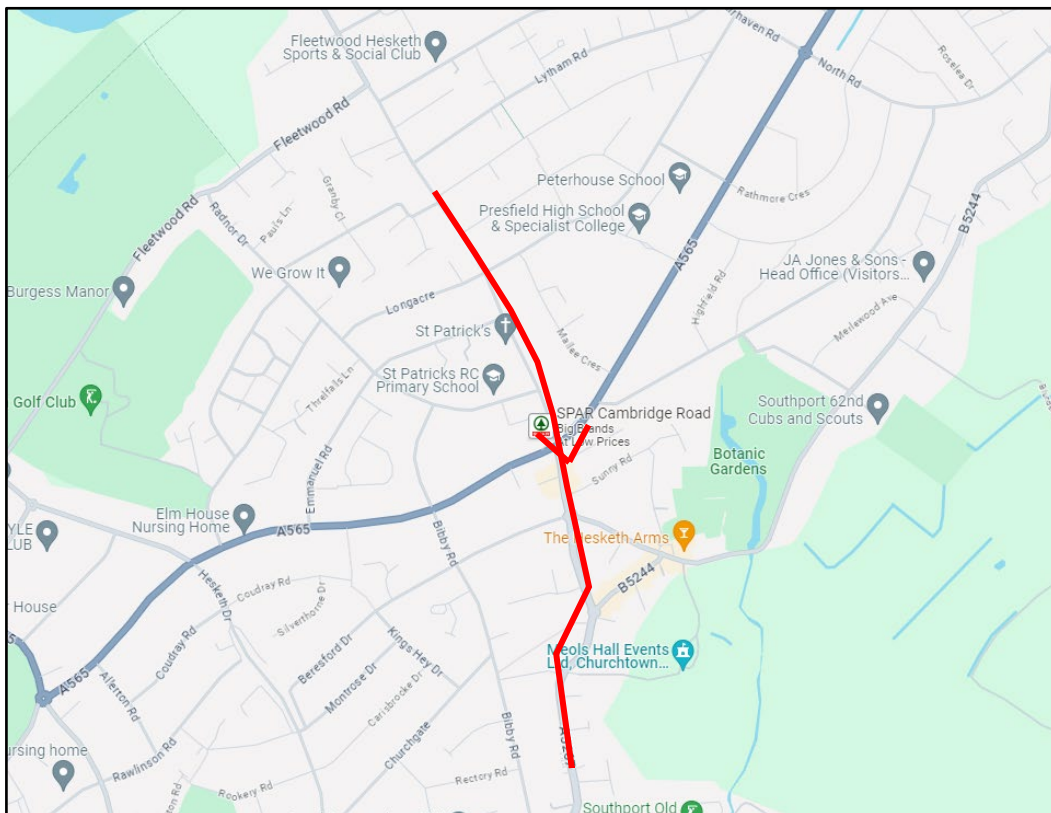
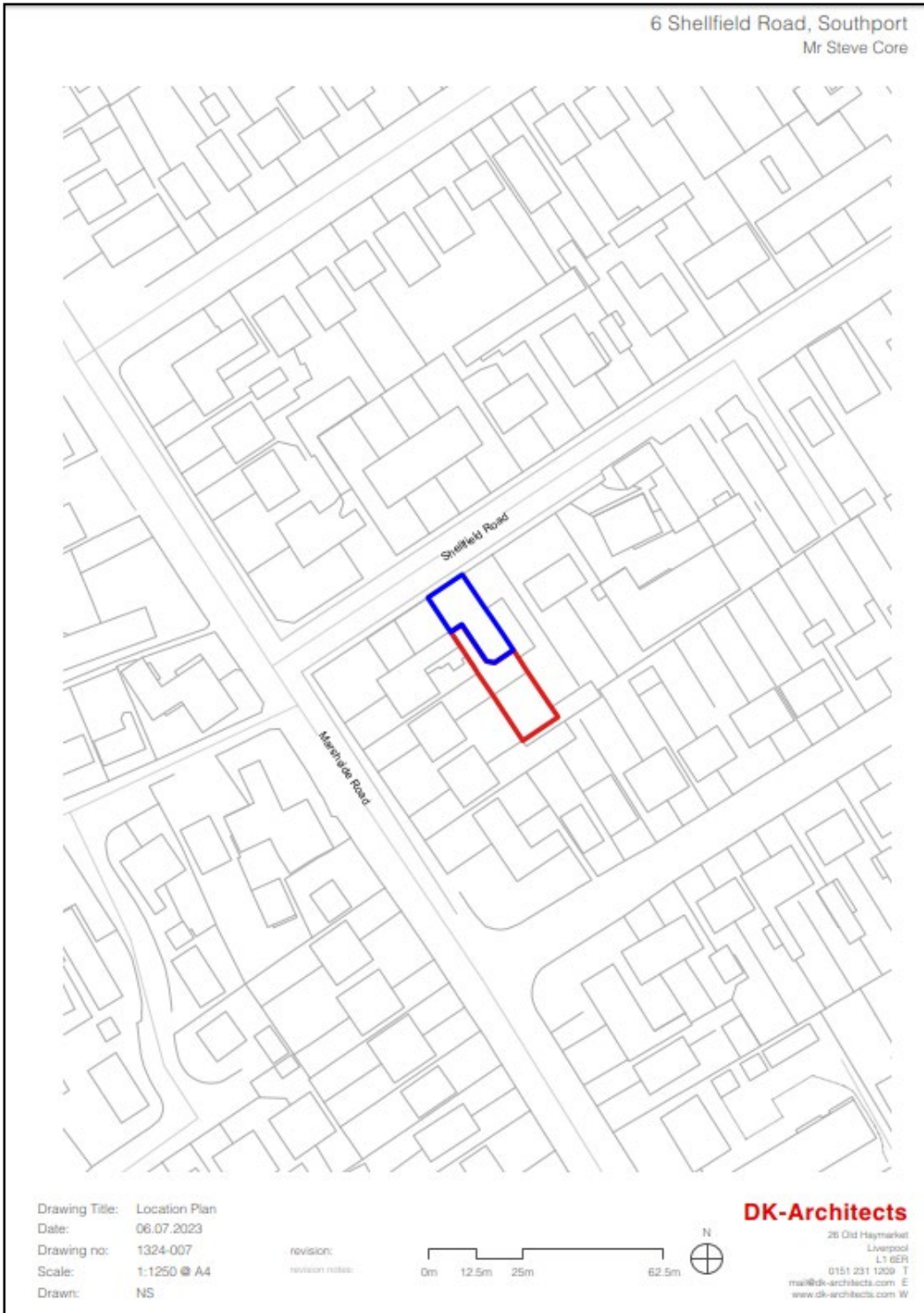


Figure 12: Flood warning evacuation route

7 Flood Risk Summary and Conclusion

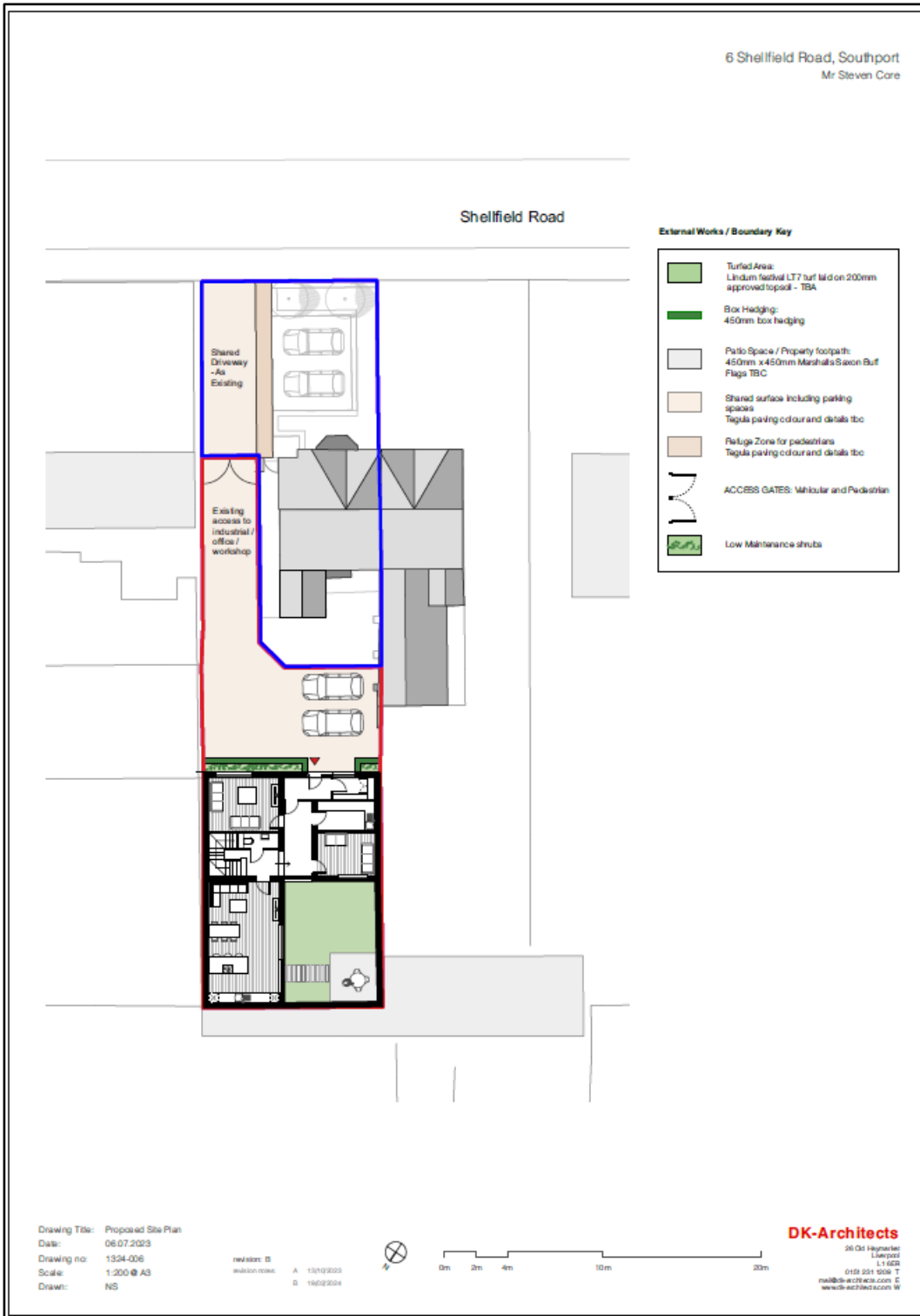
- 7.1 From the above assessment of flood risk, it has been established that the development site is entirely within Flood Zone 3 for river and sea flooding.
- 7.2 The site benefits from existing flood defences.
- 7.3 The EA flood map for planning classes the flood risk from river and the sea to be less than 0.1% ACP when existing sea defences are considered.
- 7.4 Should the sea defences over top or fail the site would be at risk of sea flooding.
- 7.5 Residents should be advised to sign-up to flood warnings at www.gov.uk/sign-up-for-flood-warnings and be provided a copy of the Sefton's Be Flood Ready Leaflet.
- 7.6 In the event of a flood warning being issued the residents should leave towards the A5267 to Churchtown.
- 7.7 Having spoken to the Environmental Agency, all bedrooms proposed to be ground floor level have been relocated to first floor level to alleviate any issues raised from previous submissions.
- 7.8 Existing drainage sewers to the house will be used.
- 7.9 Where new drainage is proposed it should adopt SuDS principles and follow the surface water discharge hierarchy.
- 7.10 All other sources of flood risk are considered to be low.

Appendix A



Appendix B

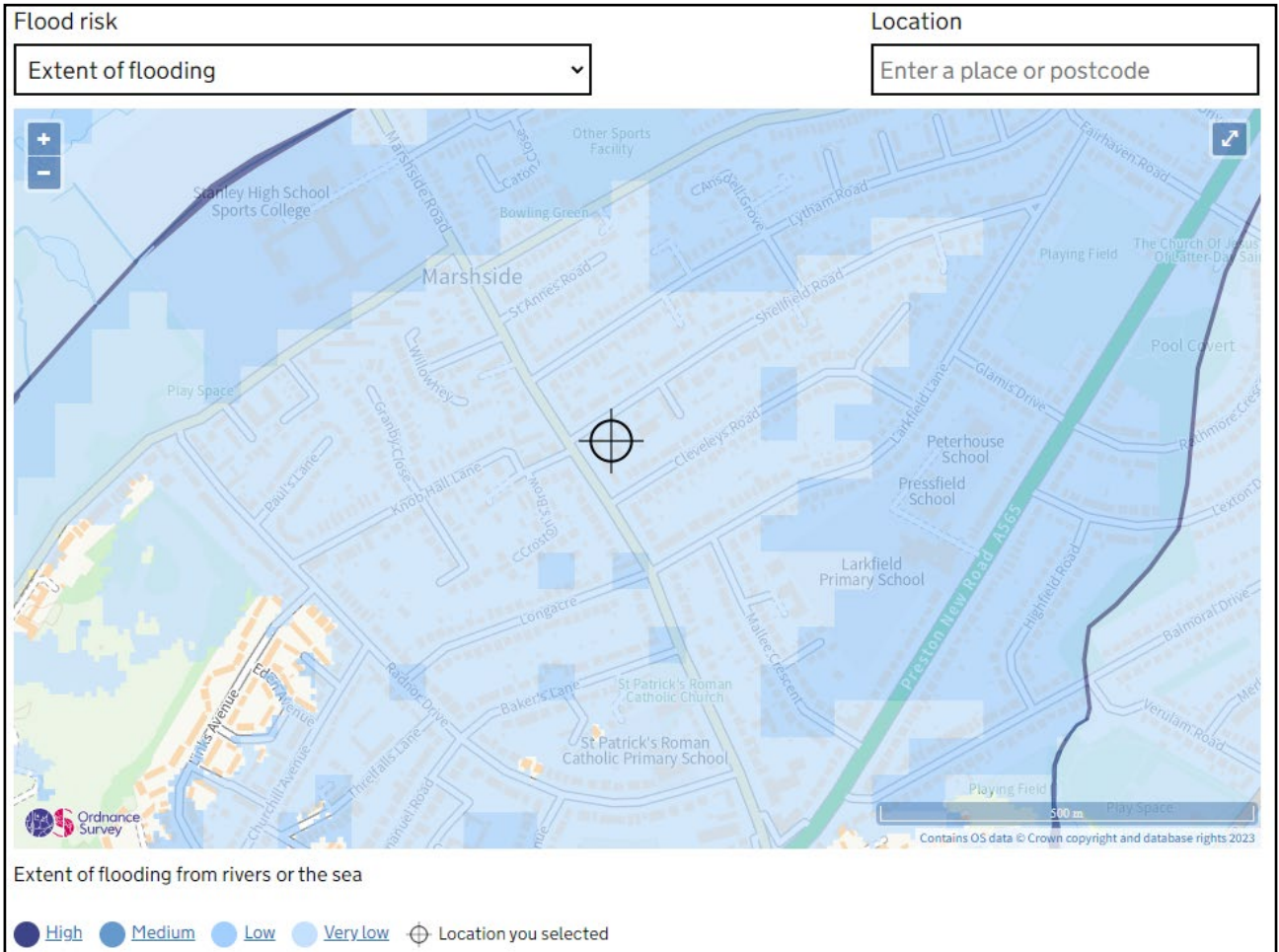




Appendix C

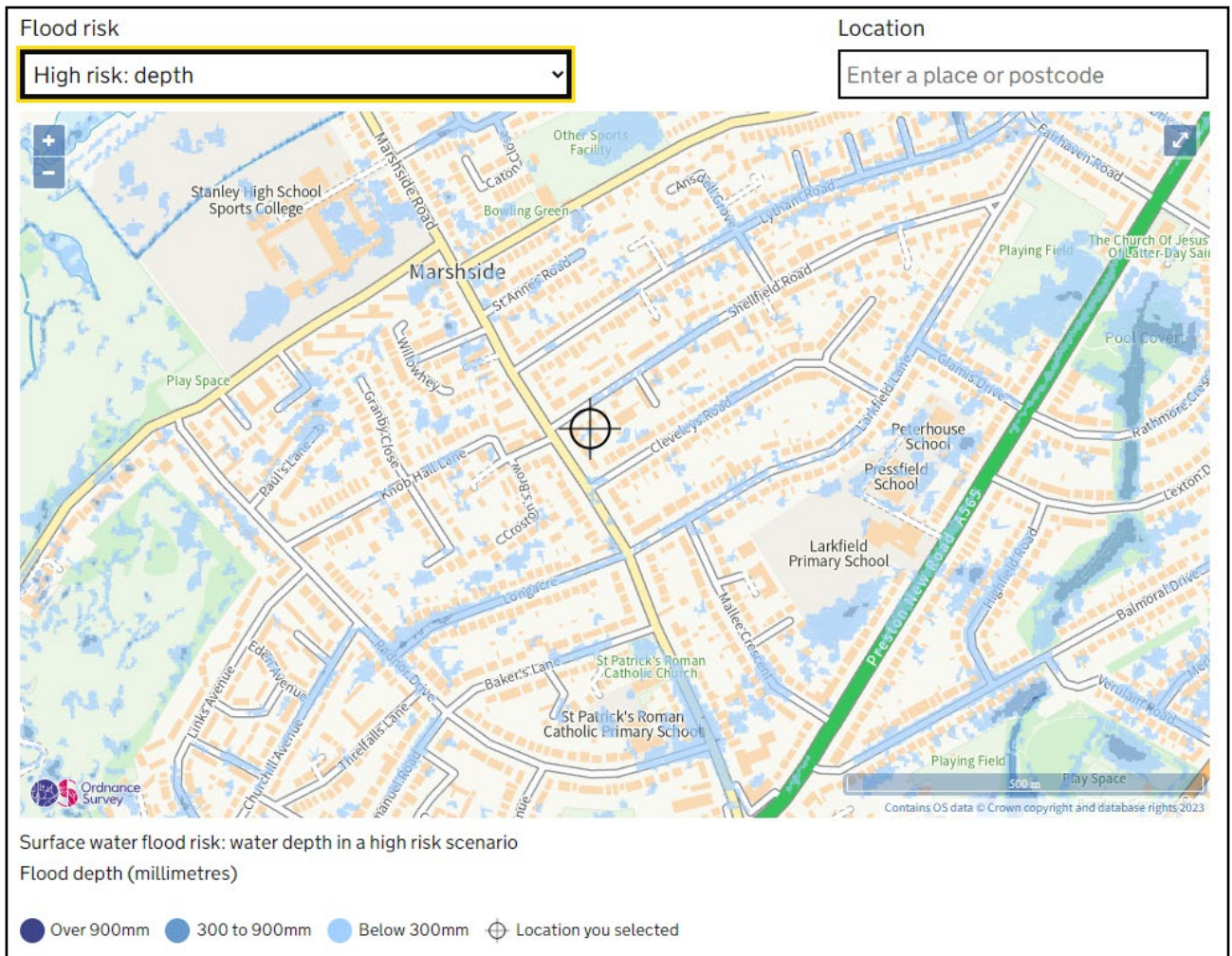
Environment Agency Flood Risk Maps

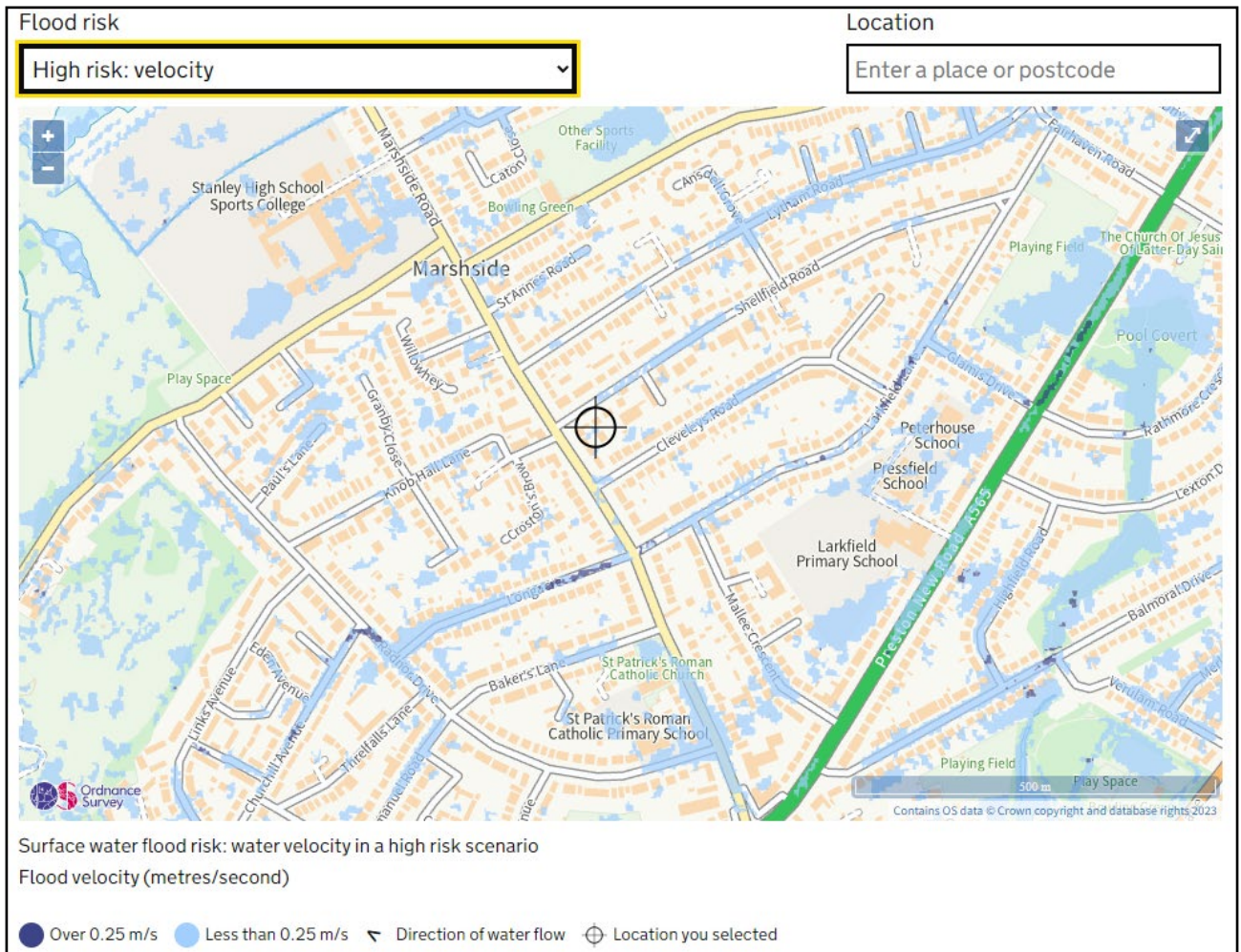
Flood Risk from Rivers or the Sea

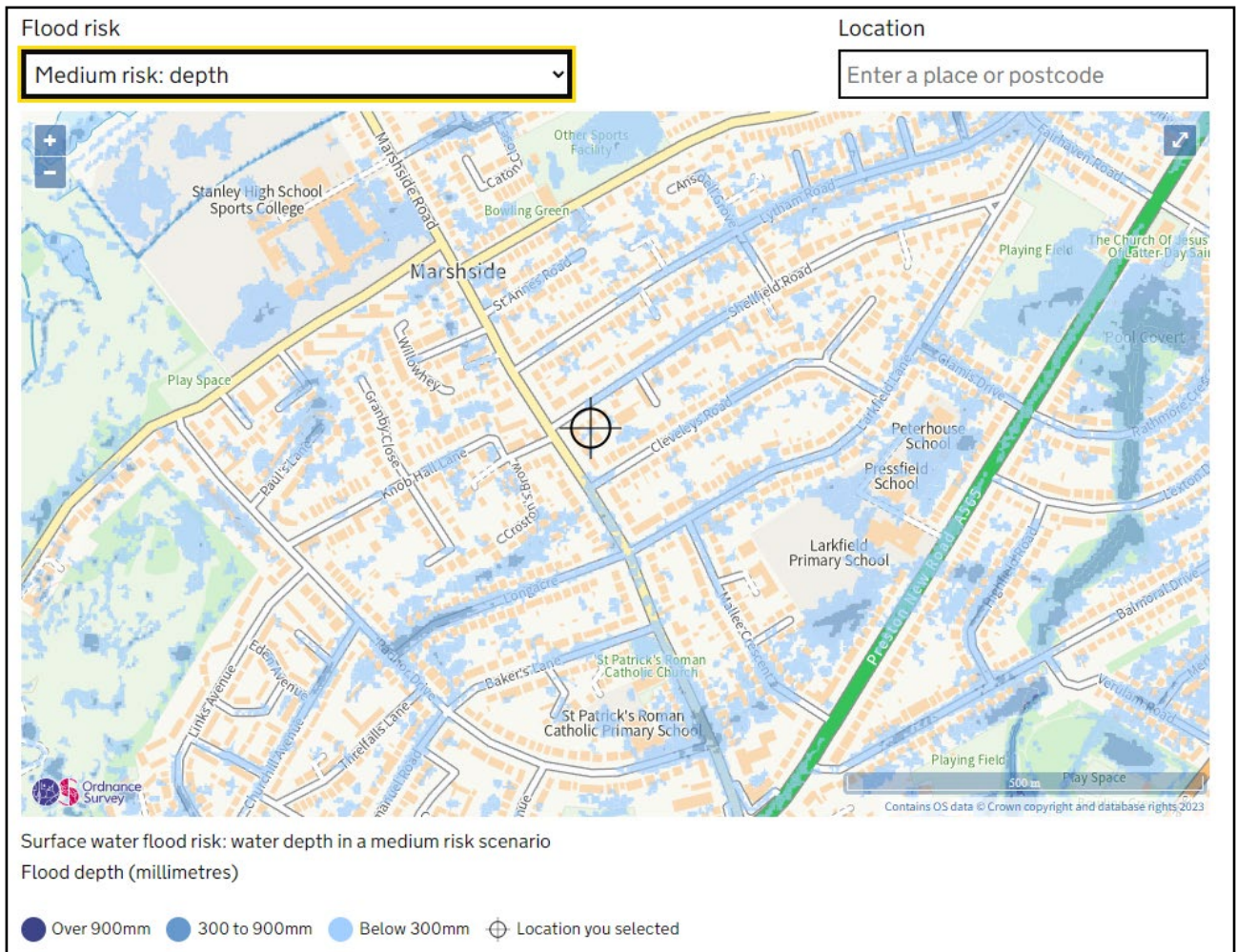


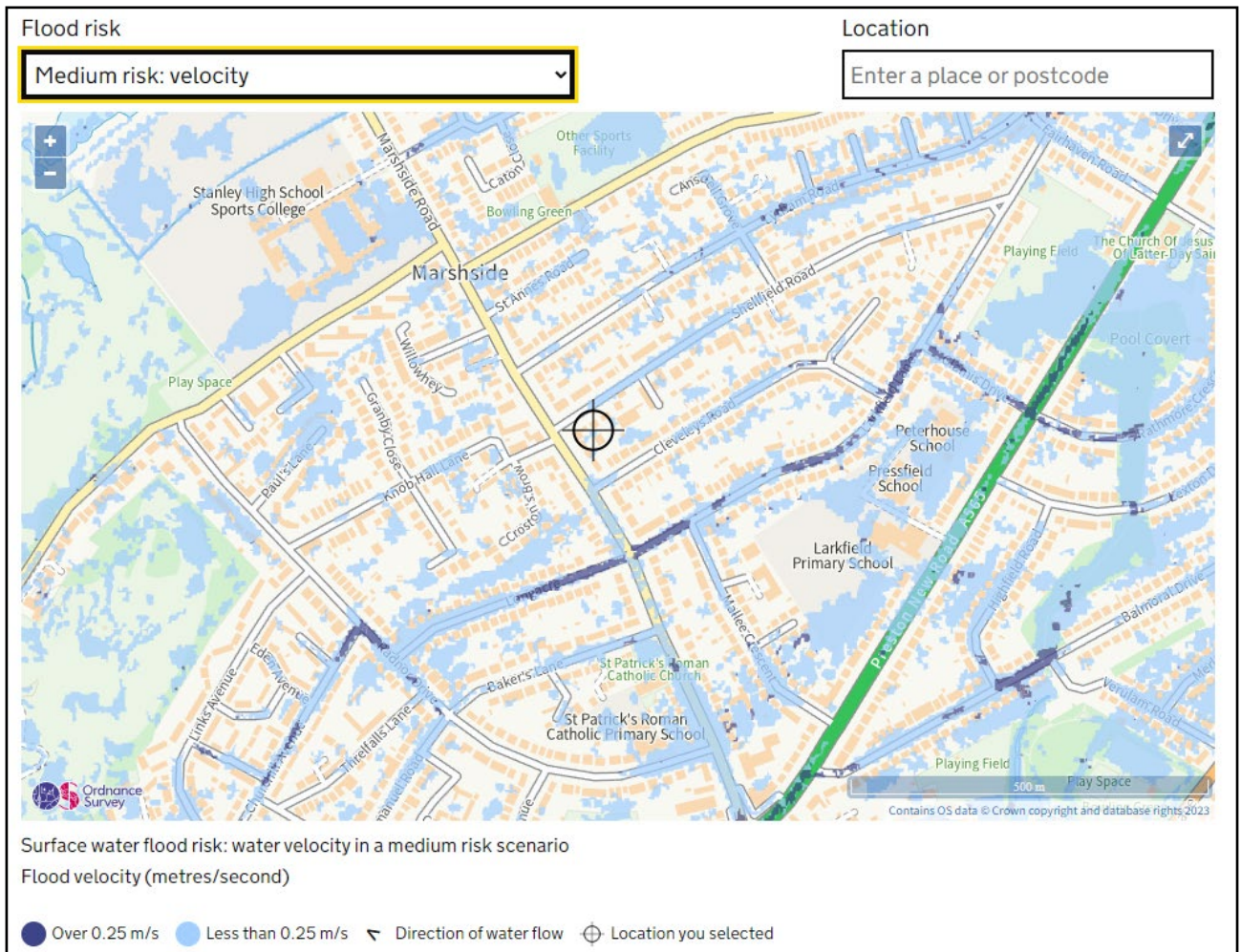
Flood Risk from Surface Water

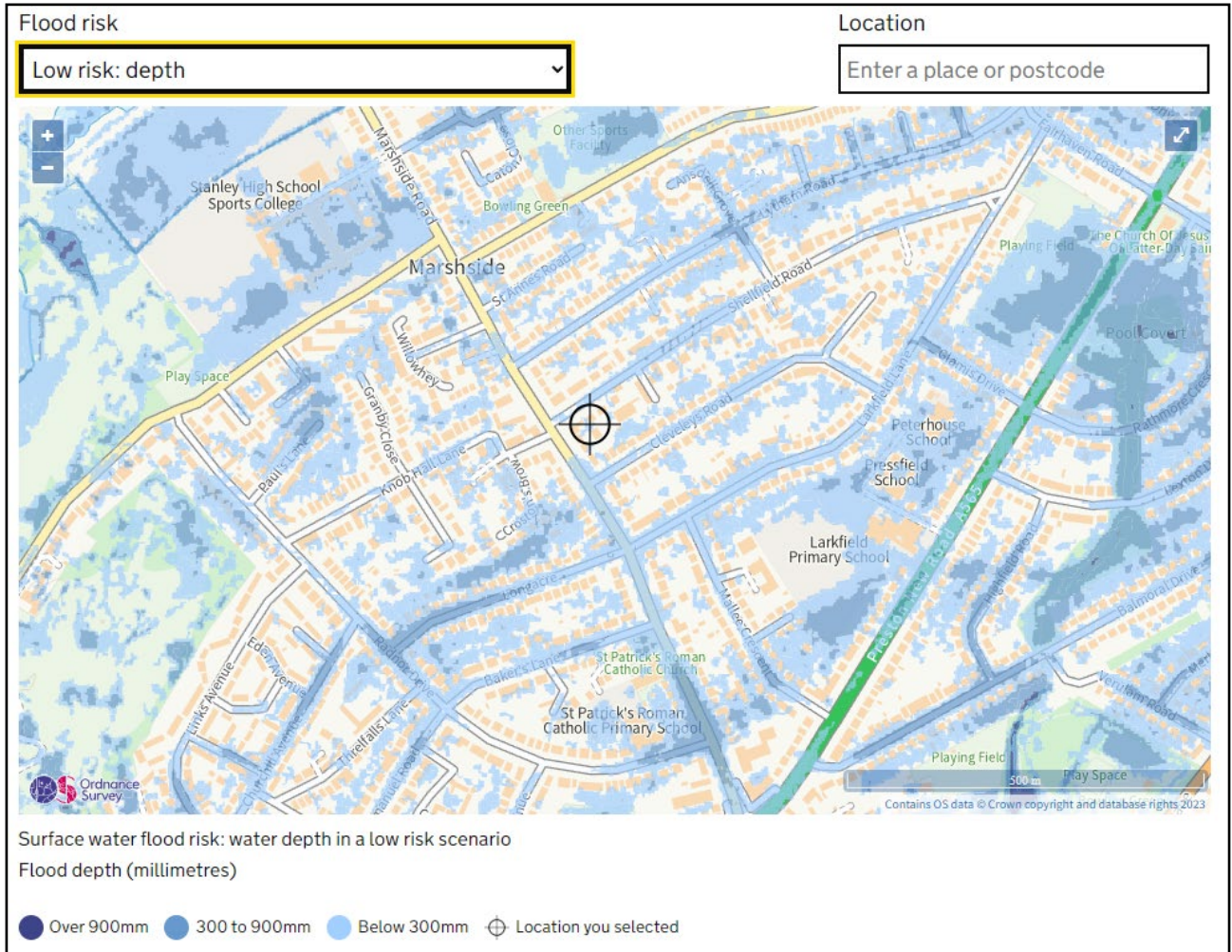


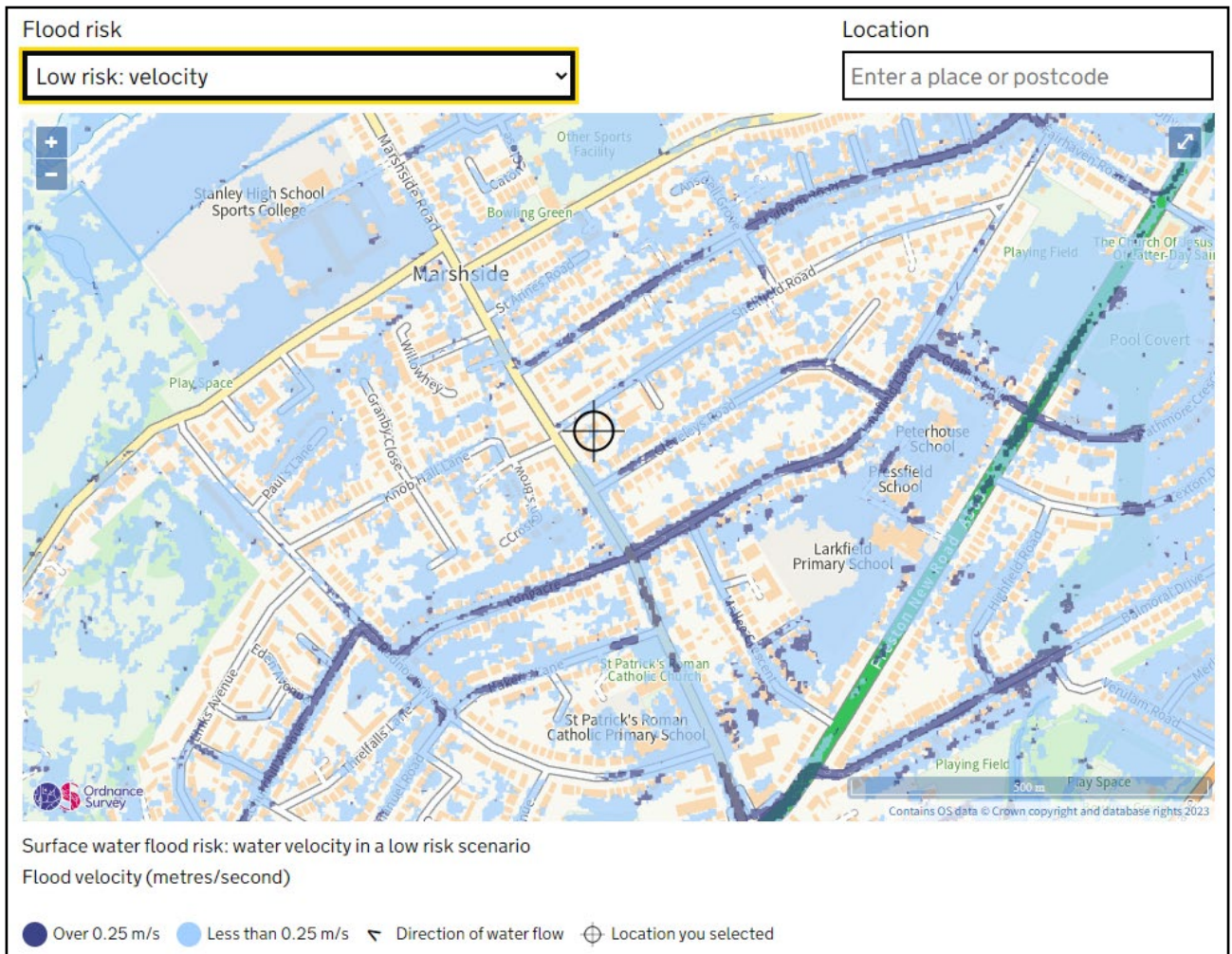




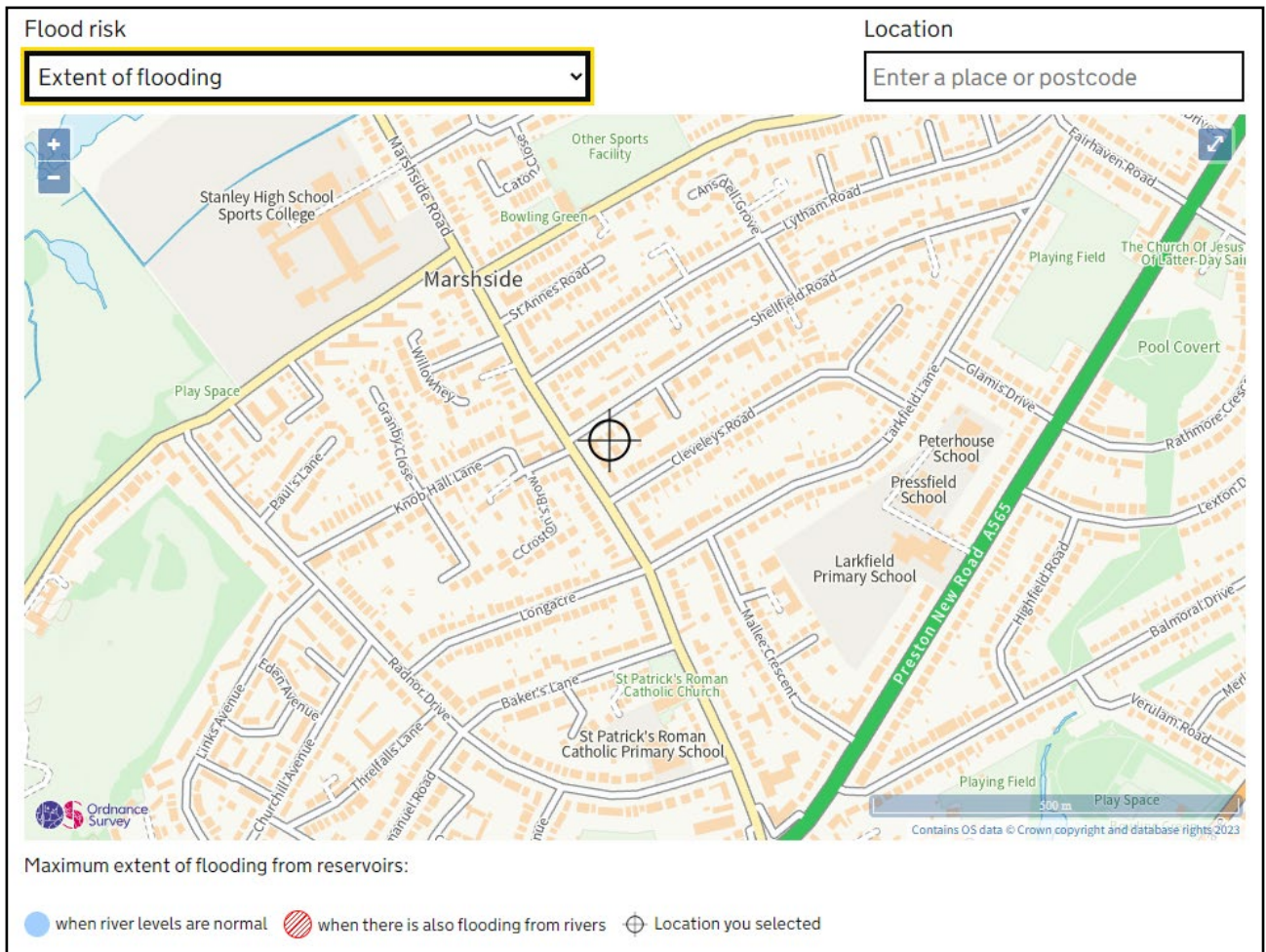








Flood Risk from Reservoir



Appendix D

Dear Matt,

Enquiry regarding product data.

Thank you for your enquiry received on 18th September. Again, please accept our apologies for the delay.

We respond under the Freedom of Information Act 2000 and Environment Information Regulations 2004. Please find further information attached and below:

- *The Tidal data provided has been taken from the Ribble Estuary Tidal ABD study produced in 2014. Please note that the tidal climate change allowances provided here may not be appropriate for some planning applications. In these instances please refer to Table 1, Sea Level Rise guidance on the following website: www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances*
- *The data shows the site to be unaffected by all the defended scenarios from the 2014 Ribble Estuary Tidal study, and therefore no outline maps have been provided.*
- *Please be advised that the Environment Agency holds records of the site being in close proximity to flooding during the following events:*
 - *September 2017**Please be aware that this does not necessarily mean that flooding has not occurred at other times at this site in the past as our records are not comprehensive.*
- *For all queries relating to flooding from surface water, ordinary watercourses and groundwater flooding, please contact the Lead Local Flood Authority Lancashire County Council.*
- *Surface Water Maps can be viewed online at <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>.*

Please refer to [Open Government Licence](#) which explains the permitted use of this information.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Kind regards.

Dear Matt,

Thank you for your enquiry received on 18th September 2023

We respond under the Freedom of Information Act 2000 and Environment Information Regulations 2004.

The Environment Agency does not hold any breach analysis data for this site and therefore cannot provide a Product 8.

Please refer to [Open Government Licence](#) which explains the permitted use of this information.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Kind regards.

Rosie Irlam
Customer Engagement officer
Cumbria and Lancashire

Flood risk assessment data

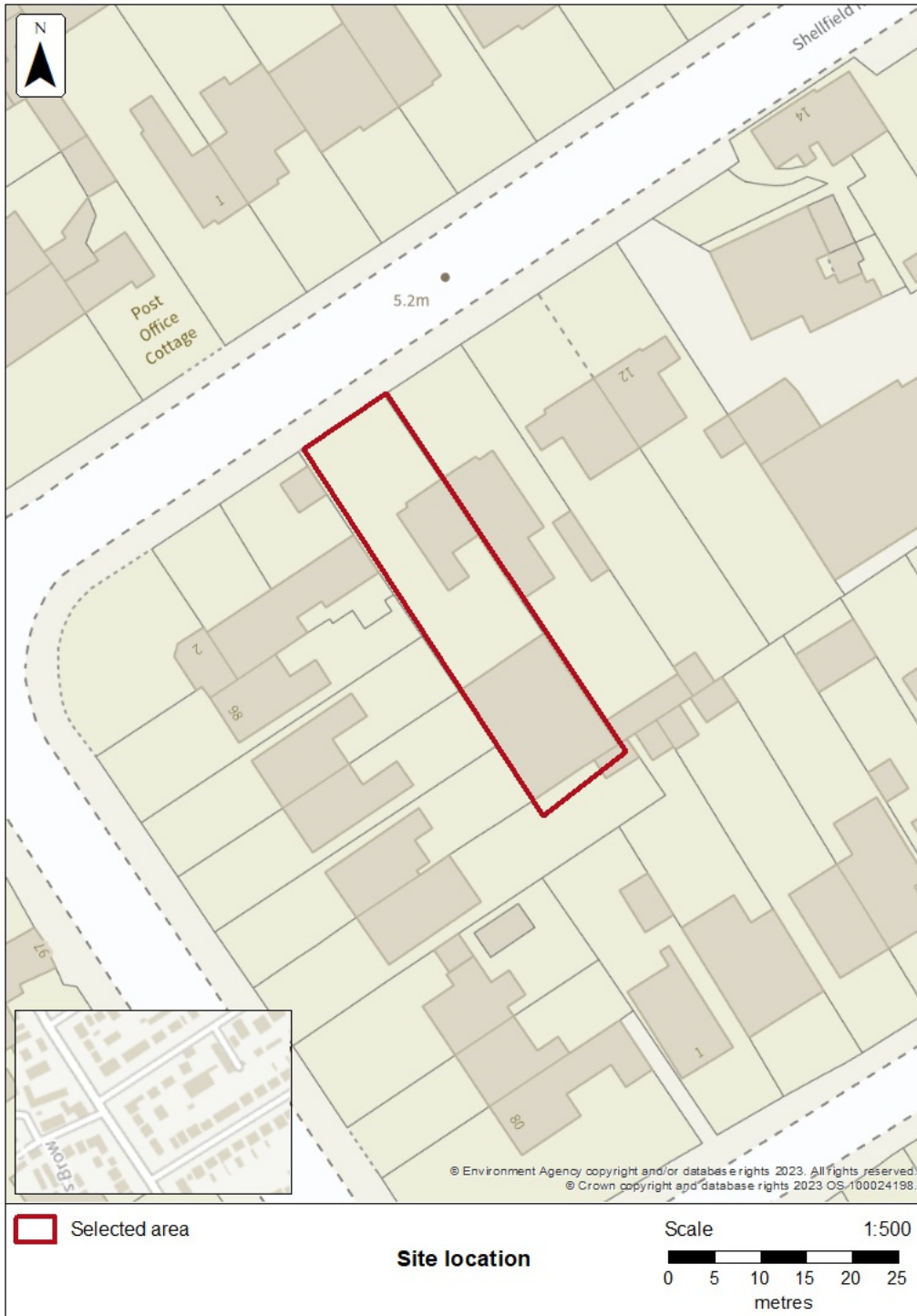
Location of site: 336049 / 419399 (shown as easting and northing coordinates)

Document created on: 11 October 2023

This information was previously known as a product 4.

Customer reference number: 16KFGNADGFCB

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)
- historic flooding
- flood defences and attributes
- 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.cmlnc@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.

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: Ribble 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 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 3.

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

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

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

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

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

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

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







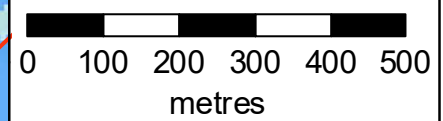
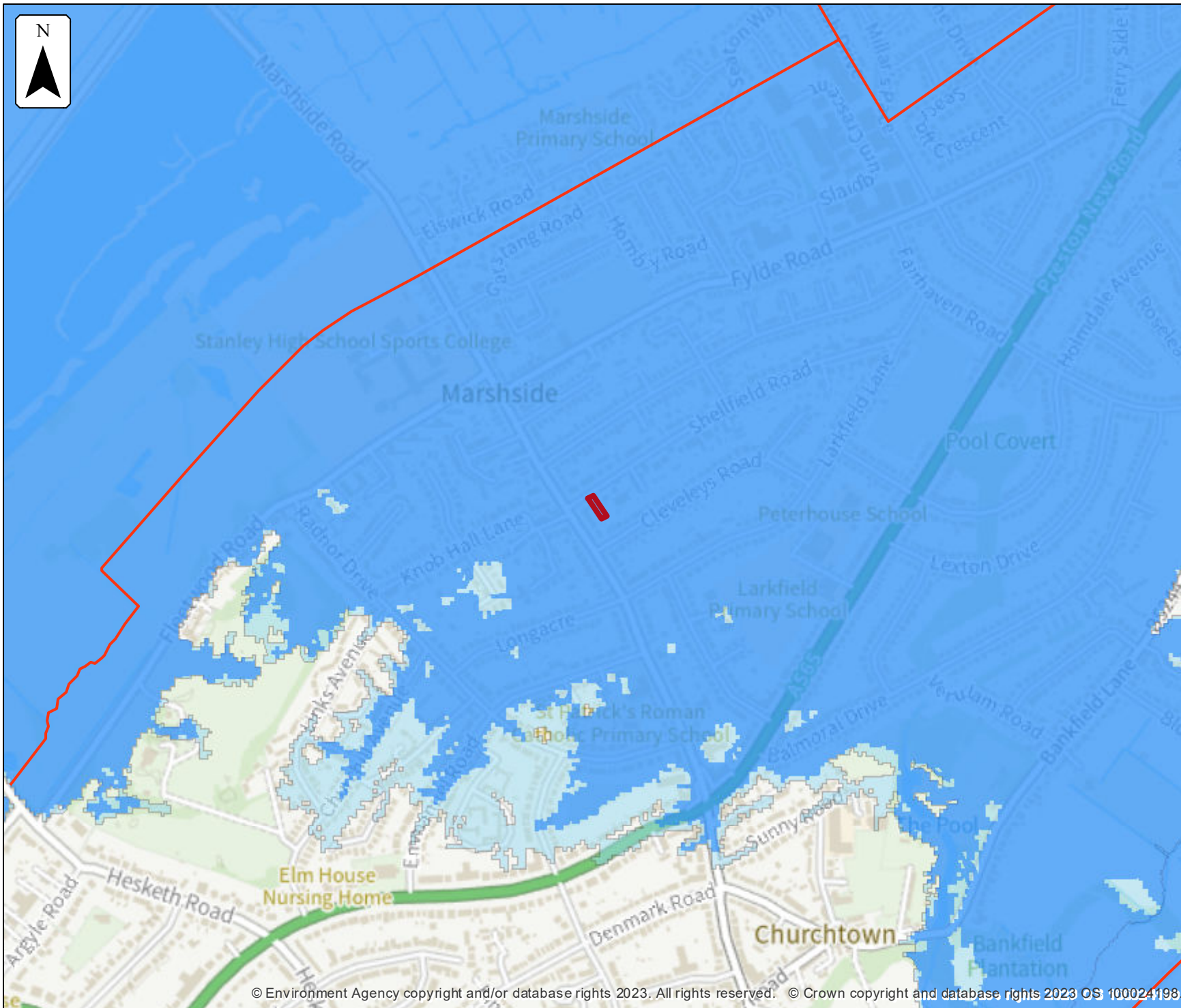
Flood map for planning

Location (easting/northing)
336049/419399

Scale
1:10,000

Created
11 Oct 2023

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



Historic flooding

This map is an indicative outline of areas that have previously flooded. Remember that:

- our records are incomplete, so the information here is based on the best available data
- it is possible not all properties within this area will have flooded
- other 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 flooding from rivers or the sea

You can also 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.

[Download recorded flood outlines in GIS format](#)



Historic flood map

Location (easting/northing)
336049/419399

Scale
1:10,000

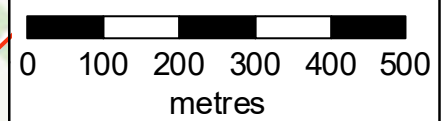
Created
11 Oct 2023

 Selected area

 Main river

Date of flood event

 September, 2017



Historic flood event data

Start date	End date	Source of flood	Cause of flood	Affects location
5 September 2017	5 September 2017	other	local drainage/surface water	No

Flood defences and attributes

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

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

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






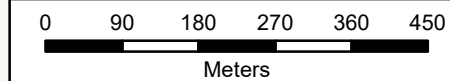
Flood Defences

Location (easting/northing)
336049 / 419399

Scale
1:8,908

Created
11 Oct 2023

-  Selected area
-  Main river
-  Flood defence



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	69476	Embankment	150	3 - Fair	-	-	6.45

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
- 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









Defended modelled tidal extent

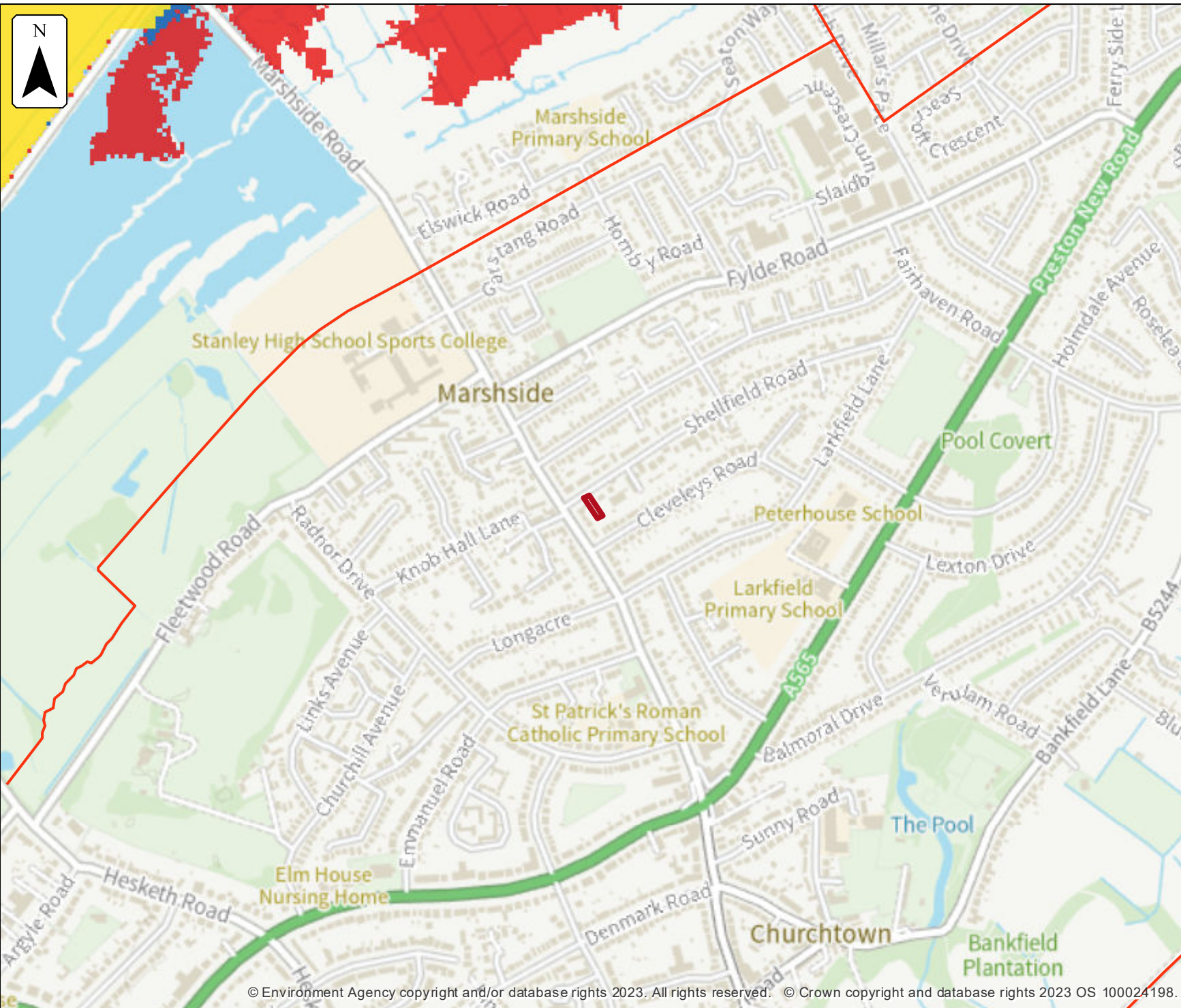
Location (easting/northing)
336049/419399

Scale Created
1:10,000 11 Oct 2023

Model name
Ribble 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










Defended climate change modelled tidal extent

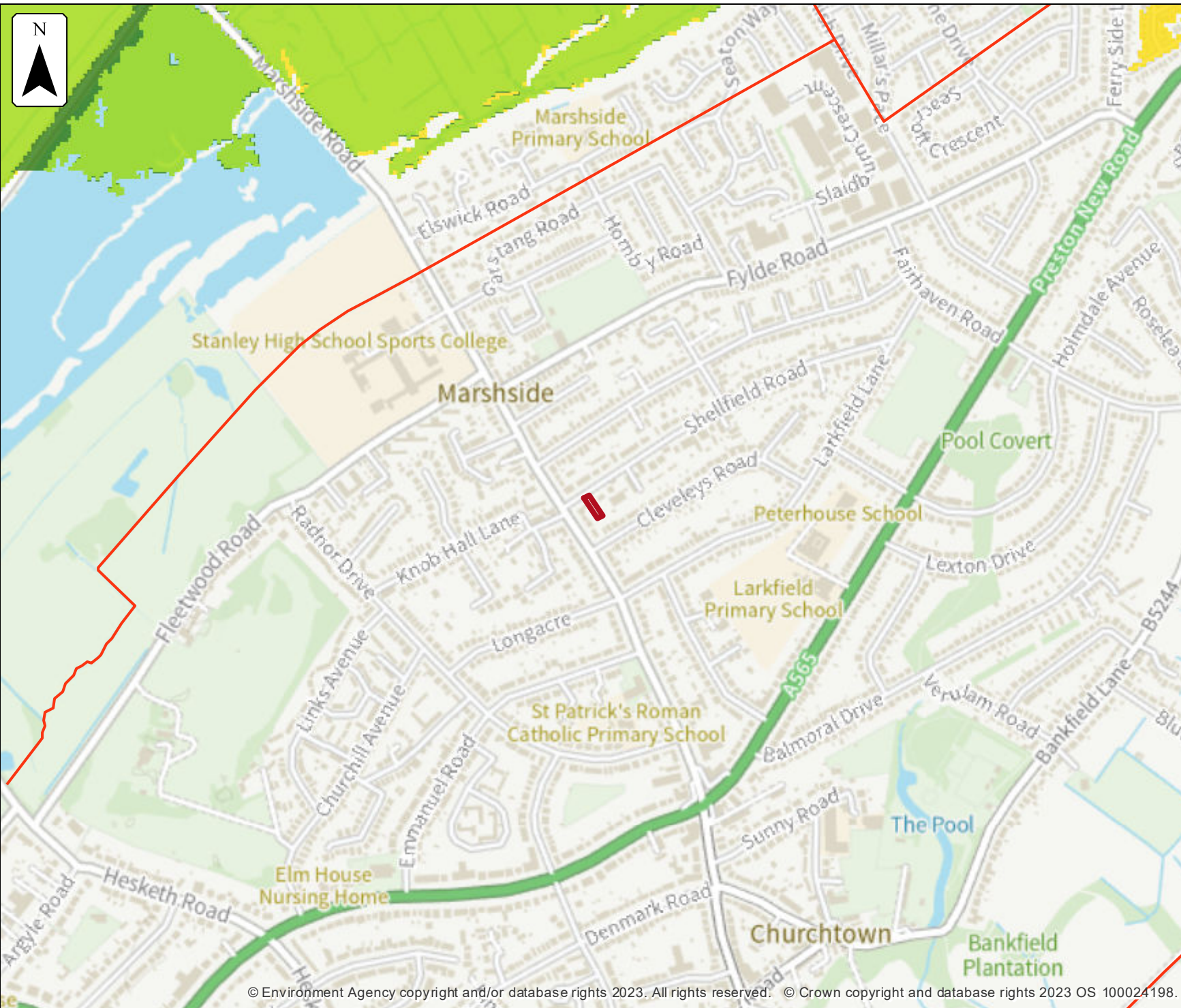
Location (easting/northing)
336049/419399

Scale Created
1:10,000 11 Oct 2023

Model name
Ribble 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





Defences removed modelled tidal extent

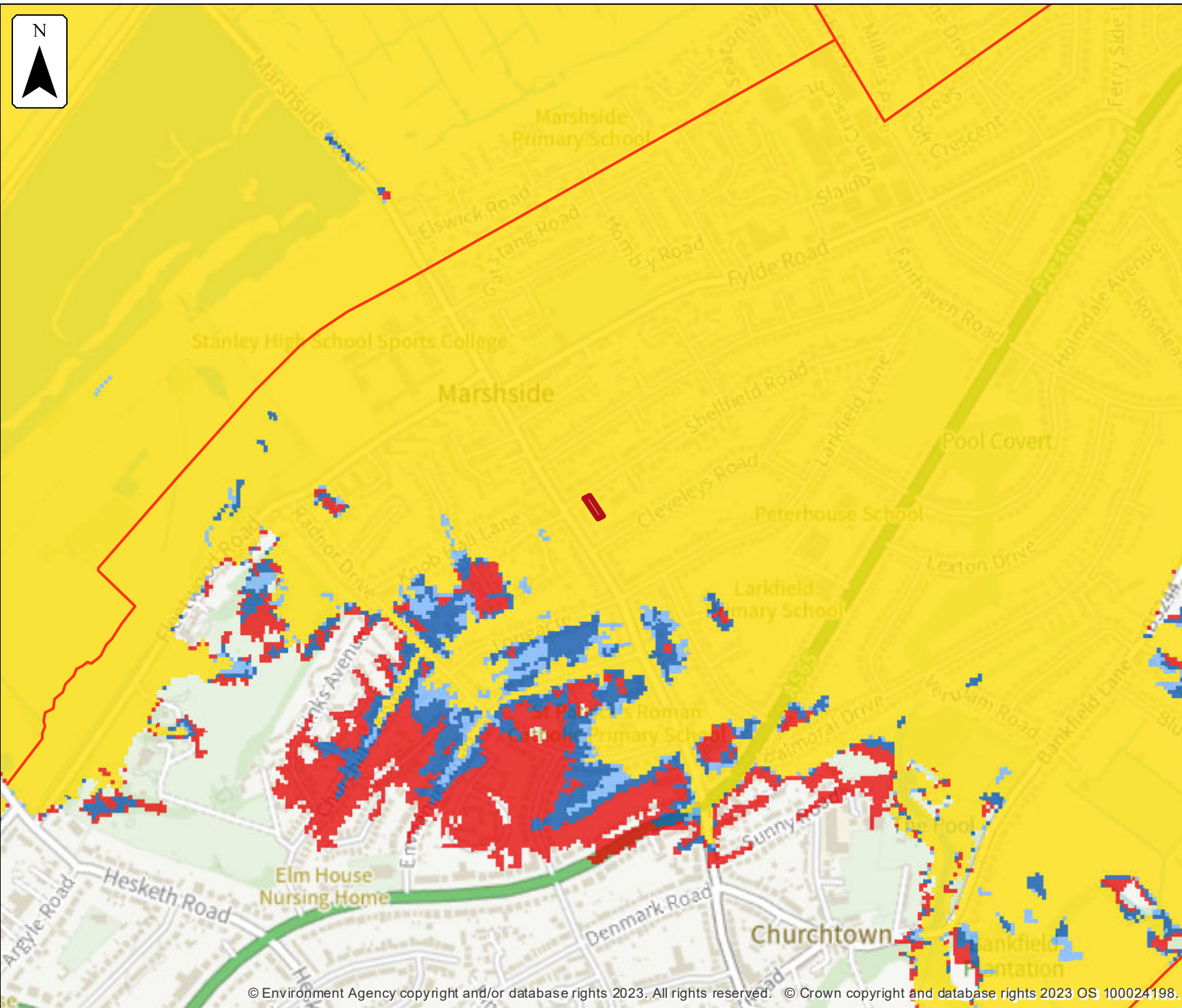
Location (easting/northing)
336049/419399

Scale Created
1:10,000 11 Oct 2023

Model name
Ribble 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










Defences removed climate change modelled tidal extent

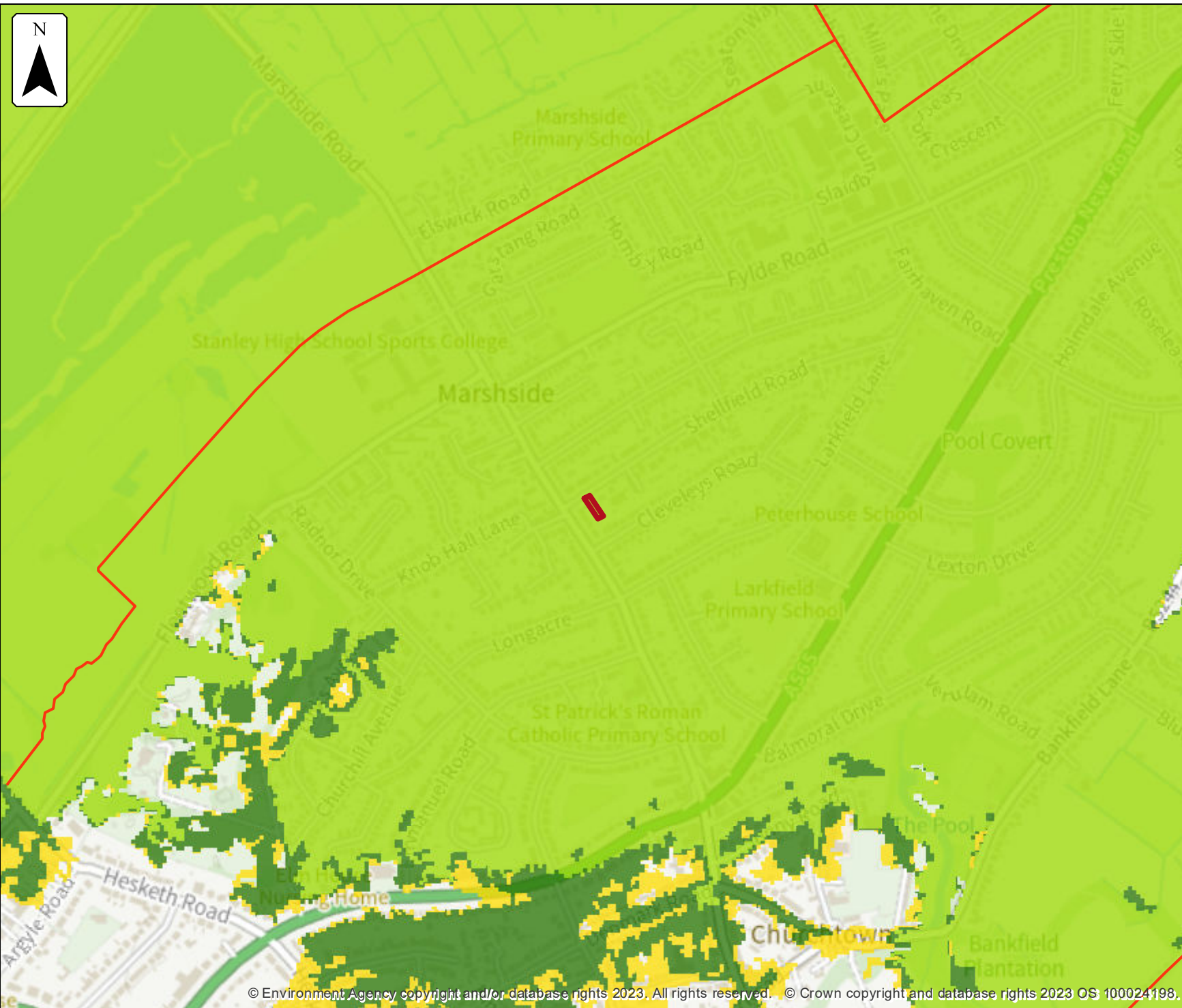
Location (easting/northing)
336049/419399

Scale Created
1:10,000 11 Oct 2023


Model name
**Ribble 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

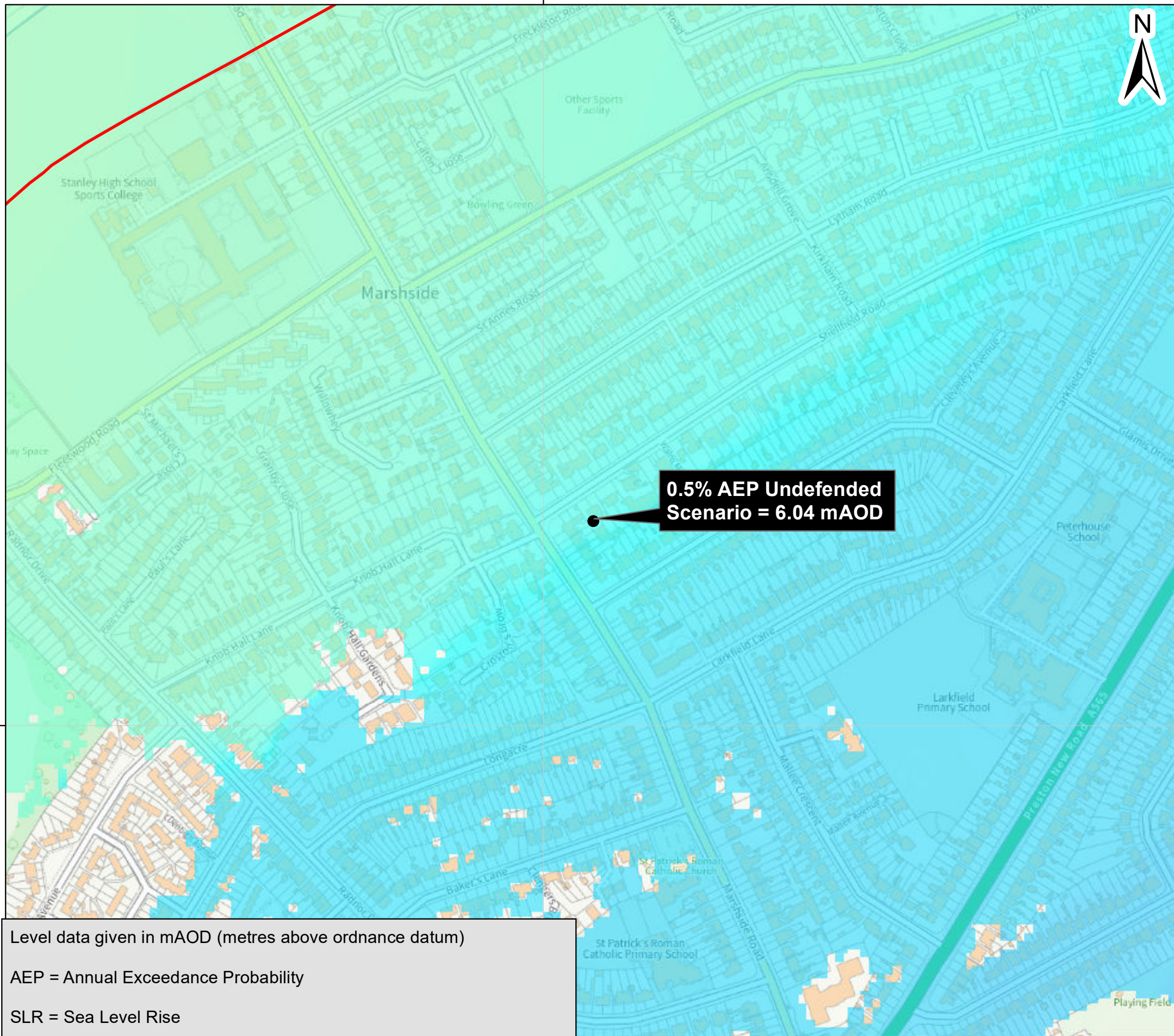
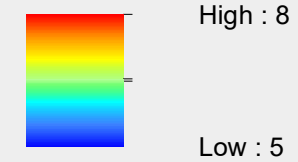


Key

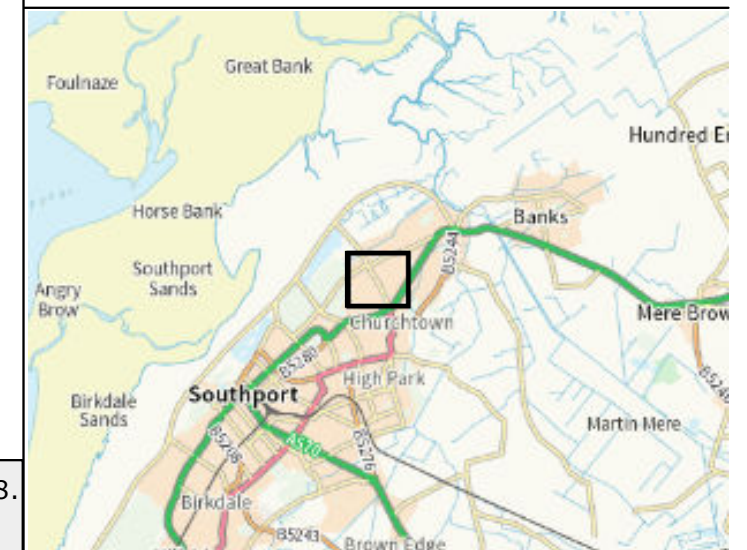
 Statutory Main Rivers

**0.5% Annual Exceedance Probability
Undefended Scenario**


mAOD



Level data given in mAOD (metres above ordnance datum)
AEP = Annual Exceedance Probability
SLR = Sea Level Rise

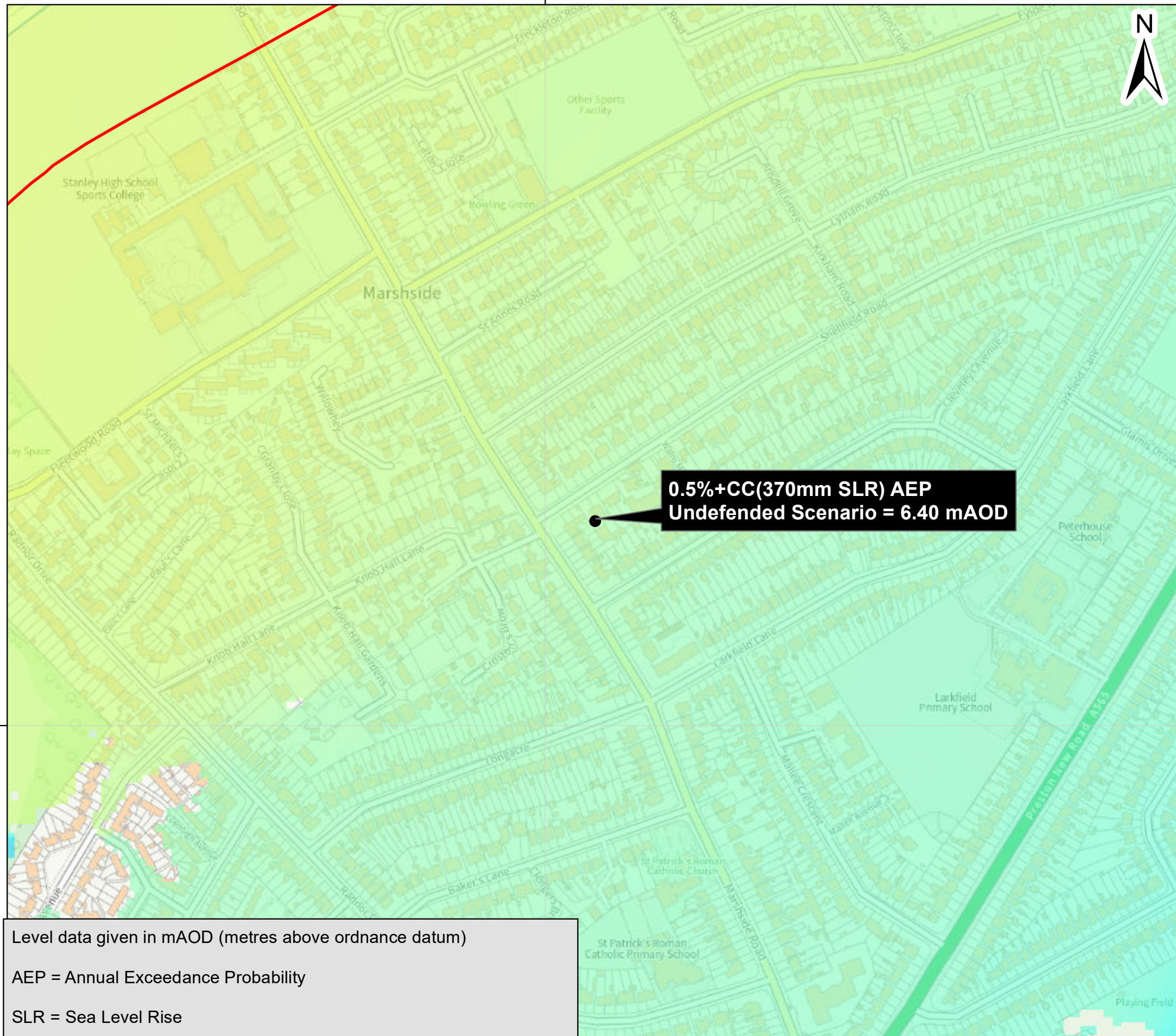
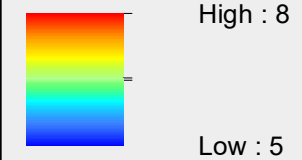


Key

 Statutory Main Rivers

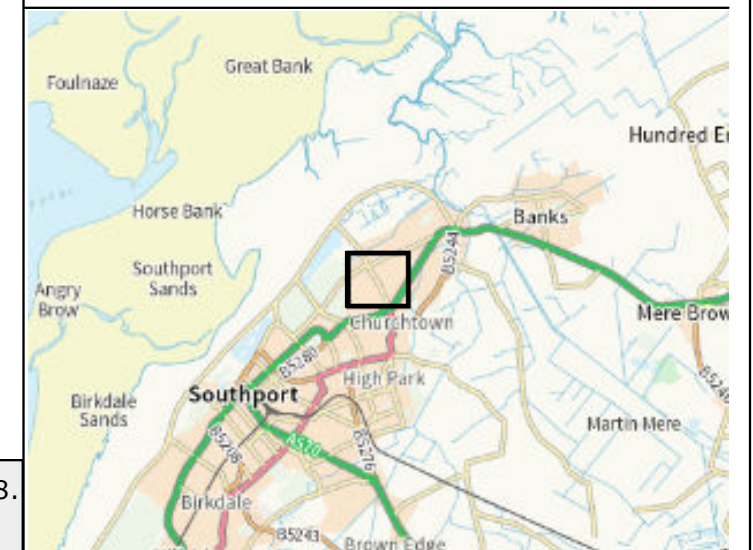
**0.5%+Climate Change (+370mm SLR)
Annual Exceedance Probability
Undefended Scenario**

mAOD



**0.5%+CC(370mm SLR) AEP
Undefended Scenario = 6.40 mAOD**

Level data given in mAOD (metres above ordnance datum)
AEP = Annual Exceedance Probability
SLR = Sea Level Rise



419200

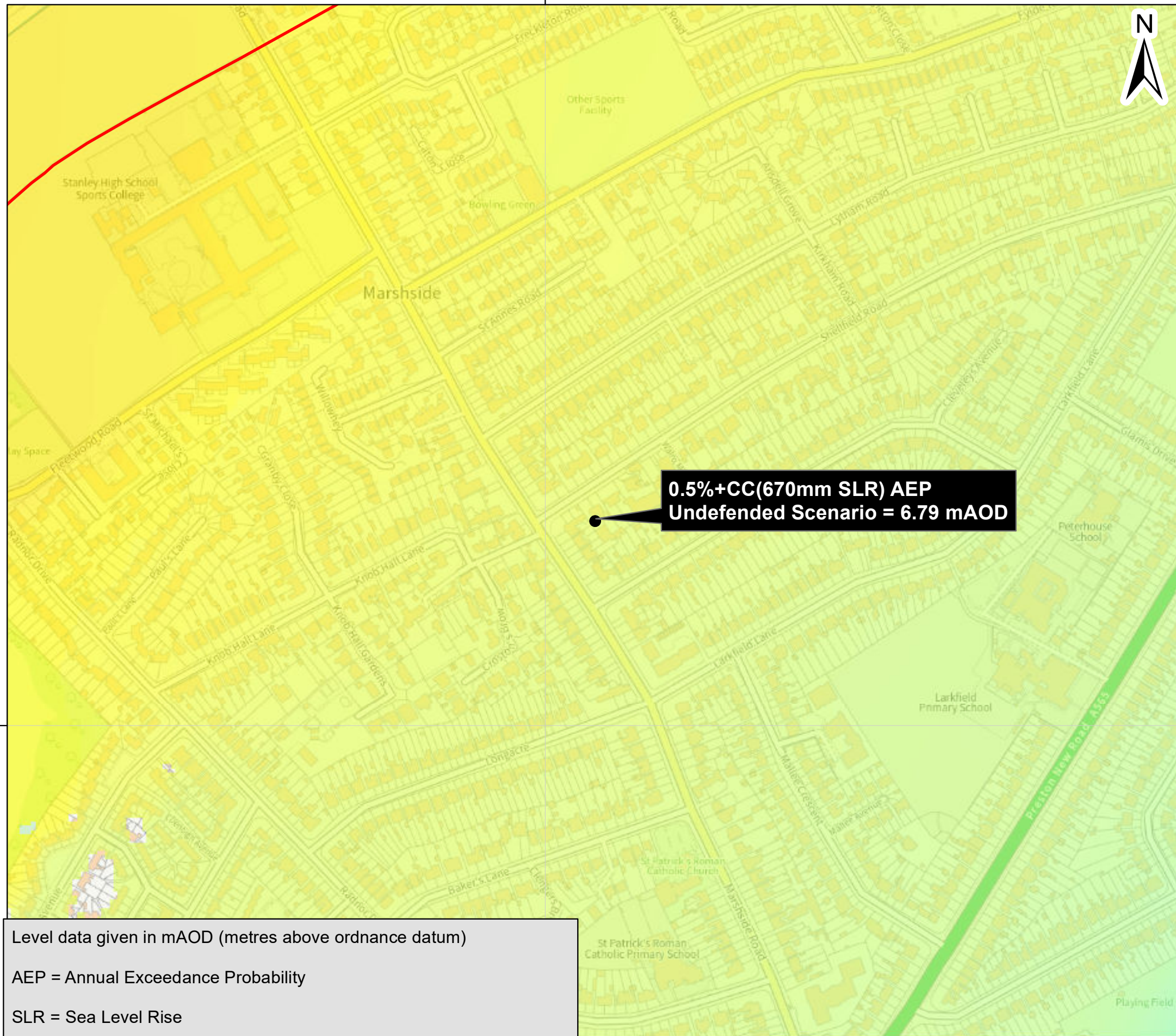
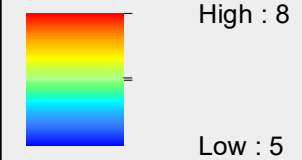
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Key

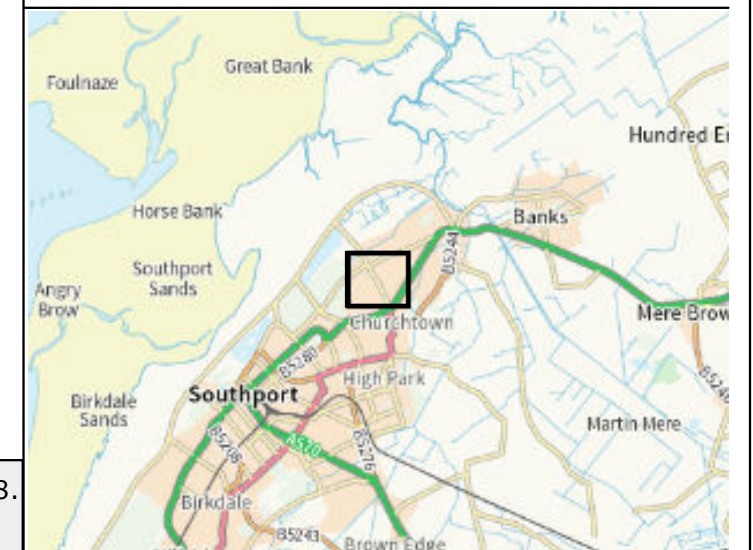
 Statutory Main Rivers

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

mAOD



Level data given in mAOD (metres above ordnance datum)
AEP = Annual Exceedance Probability
SLR = Sea Level Rise

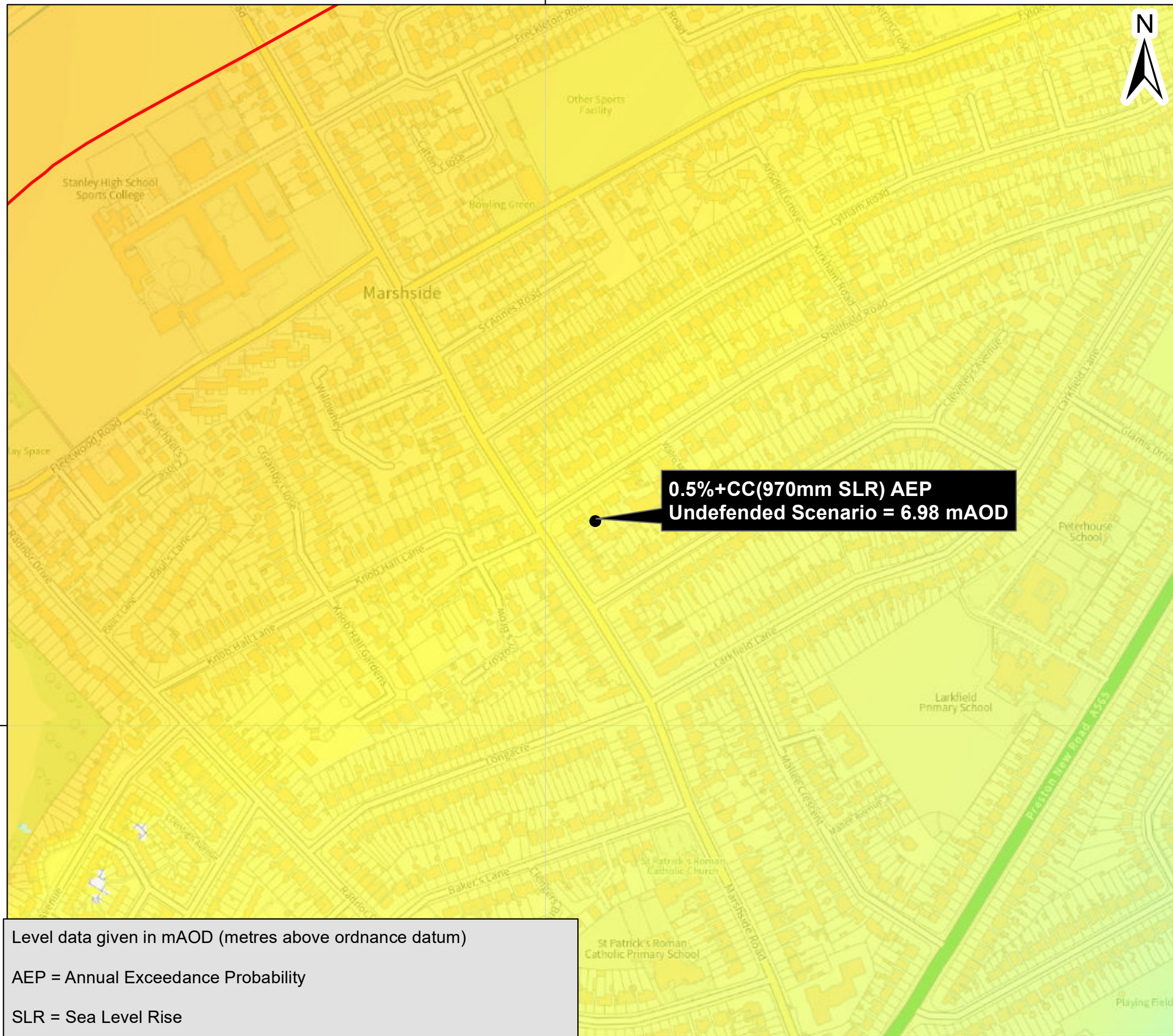
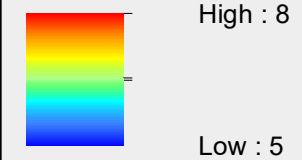


Key

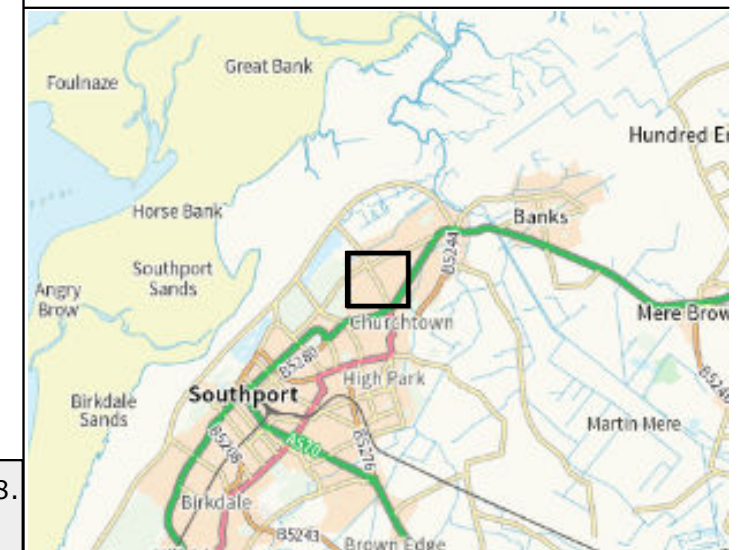
 Statutory Main Rivers

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

mAOD



Level data given in mAOD (metres above ordnance datum)
AEP = Annual Exceedance Probability
SLR = Sea Level Rise

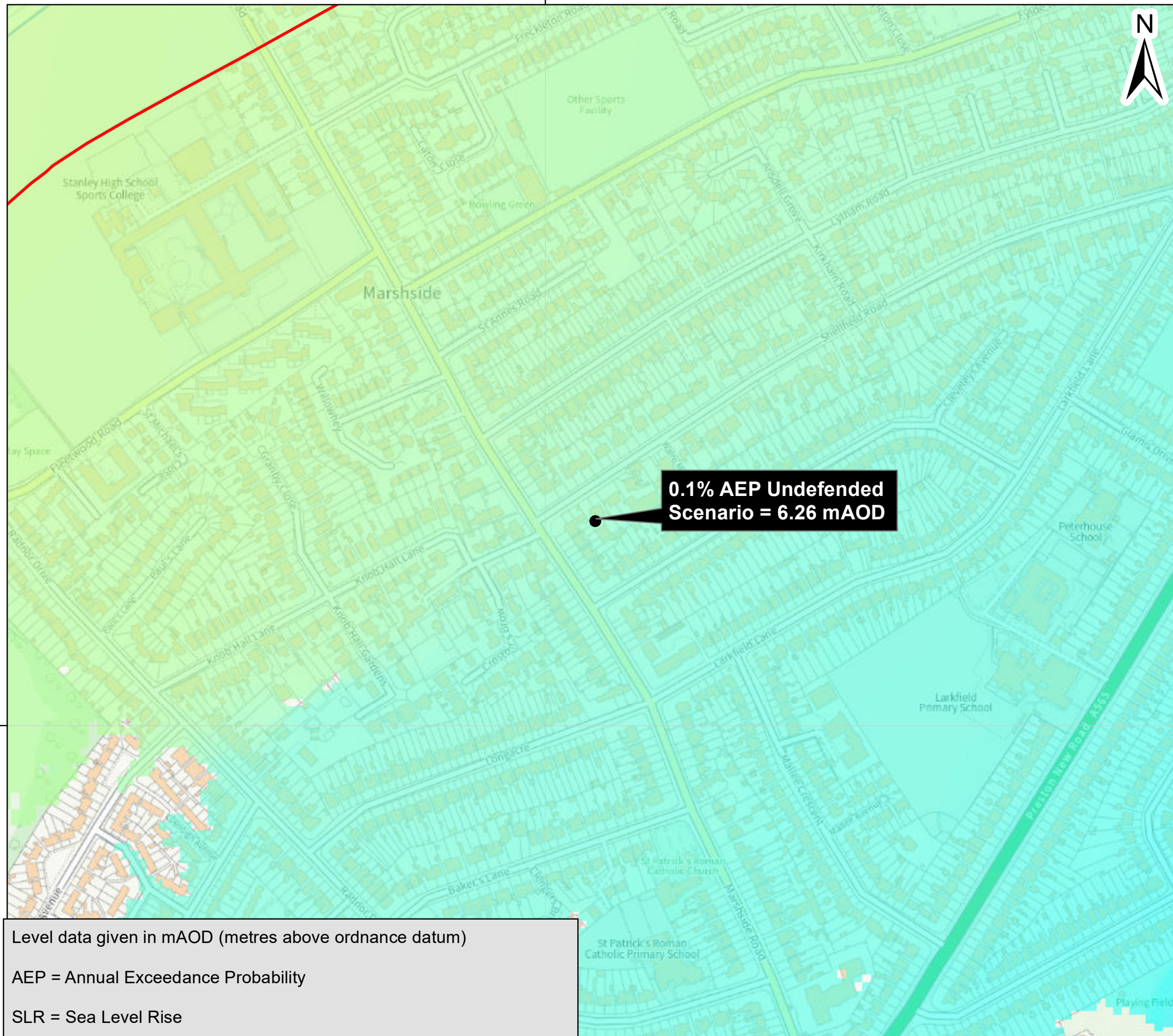
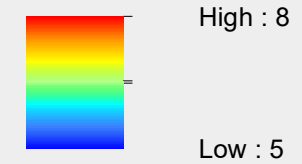


Key

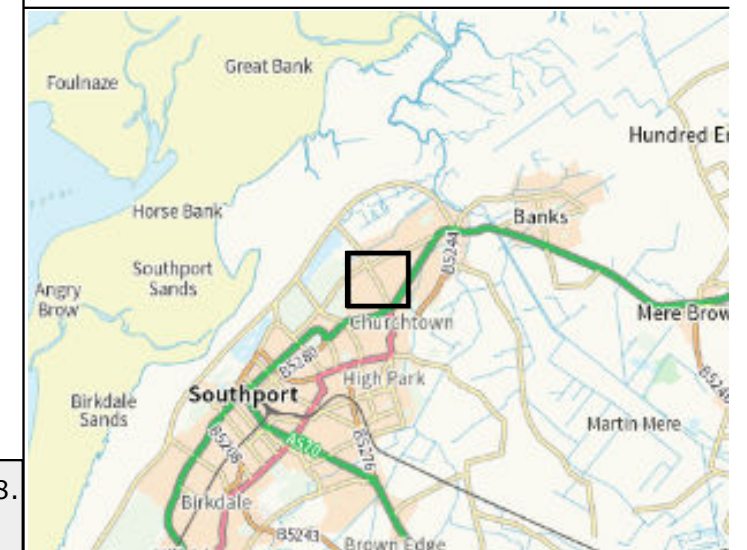
 Statutory Main Rivers

**0.1% Annual Exceedance Probability
Undefended Scenario**

mAOD



Level data given in mAOD (metres above ordnance datum)
AEP = Annual Exceedance Probability
SLR = Sea Level Rise



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