14th October 2021

South North Group Architecture Ltd
Greengate Business Centre
2 Greengate Street
Oldham
OL4 1FN

WHITEHAVEN ROAD, CLEATOR MOORS
Flood Risk and Hydraulic Modelling Scoping Exercise

We have undertaken a review of the available flood risk information at and around the site located off Whitehaven Road in Cleator Moors. The purpose of this exercise is to identify the potential flood risks associated with fluvial sources and the potential development constraints that could be associated with the risks identified. This exercise also recommends where additional work or information will be required to support a planning application for residential development.

Site Context & Initial Consultations

The site is located off Whitehaven Road in Cleator Moors, the nearest Ordnance Survey National Grid Reference is E: 385718, N: 363308 and the nearest postcode is CA25 5PY (see the Location Plan in Appendix A). The site is partly greenfield however, there is an existing chapel located onsite with some associated hardstanding, tarmacked areas. The greenfield half of site comprises of low-density vegetation with larger trees and shrubs along the boundaries. Adjacent to the northern boundary is Whitehaven Road and to the east is Crossing Close. The mapping data has also identified an onsite open and culverted Main River crossing the development site from the north to the south, as illustrated in Figure 1.

Figure 1: Site Location and Features (Betts Hydro, 2021)

Old Marsh Farm Barns
Welsh Road, Sealand
Flintshire CH5 2LY

A full topographical survey has been undertaken and included within Appendix B. The topographic survey shows the existing onsite ground levels range from approximately 73.0mAOD within the entrance of the site, down to a level of 70.8mAOD within the southern corner of site.

Initial consultations have been undertaken with the Environment Agency (EA), Cumbria County Council (CCC), Copeland Borough Council (CBC) and United Utilities (UU), to identify historical records of flooding at the site and to obtain the most up-to-date flood data (responses are included within Appendix C, D and E where these have been received). A detailed response from CBC was provided and identified the site has suffered from historical onsite flooding due to an undersized downstream culvert which is also susceptible to blockages (see correspondence within Appendix D).

Development Proposals

The purpose of this exercise is to identify the potential flood risks associated with fluvial sources and the potential development constraints that could be associated with the risks identified. This exercise also recommends where additional work or information will be required to support a change of use planning application. It is understood at this stage that the planning proposals are for residential development up to 11no. houses as illustrated within Figure 2.

Figure 2: Proposed Planning Layout (South North Group Architecture Ltd, 2021)

Old Marsh Farm Barns
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As the proposals are solely 'residential' in nature, the developed is therefore classified as 'more vulnerable' development within the Planning Practice Guidance. In terms of planning policy, there will therefore be a requirement to justify this type of development if it is deemed at risk from flooding. As the development site has been identified to be located within Flood Zone 2 and 3, the planning proposals will therefore need to be supported by the Sequential and Exception Tests, if submitted to the Local Planning authority for approval. See Table 1 below for planning and justification requirements to support development in different flood zones.

Table 1: Flood Risk Vulnerability and Flood Zone Compatibility Extract (NPPF, 2019)

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.

Notes to table 3:
This table does not show:
a. the application of the Sequential Test which guides development to Flood Zone 1 first, then Zone 2, and then Zone 3;
b. flood risk assessment requirements; or
c. the policy aims for each flood zone.

Flood Risk Summary

The key potential sources of flood risk have been considered as part of this initial scoping exercise and categorised in Table 2 below. This is not a detailed assessment, nor will it support any full planning application, but it is a starting point to develop an understanding of the potential flood risks and the associated development constraints. The focus of this exercise will be to consider the primary risks and how they might impact the development proposals.

Table 2: Key Flood Sources and Level of Risk (Betts Hydro, 2021)

SOURCE OF POTENTIAL FLOOD RISK	RISK RATING		COMMENT
Tidal		Low	The coastline is located over 6km west of the development site, therefore the tidal flood risk to site is understood to be low.
Groundwater		Low	The site is located within a low Groundwater Vulnerability Zone and no records of historic flooding at the site due to groundwater have been identified during consultations.

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SOURCE OF POTENTIAL FLOOD RISK		RISK RATING		COMMENT
Artificial Sources	Reservoirs	🟢	Low	The national flood mapping shows that the site is not at risk from reservoir flooding should a breach or failure occur in any of the nearest reservoir(s).
	Canals	🟢	Low	There are no canals located within proximity to site, the potential flood risk associated is therefore low.
	Sewers	🟢	Low	Initial consultation with United Utilities has not identified any historic sewer related flooding onsite or within the vicinity. The potential risk from this source is also therefore low.
Surface Water / Pluvial		🟢	Low to Medium	The online national flood mapping shows that the site is at very low to medium risk from surface water flooding.
Fluvial *Main Rivers* *Ordinary Watercourse* *Land Drainage Features*		🟡	Medium to High	The mapping datasets have identified the site to be located within Flood Zone 1,2 & 3. There is also a culverted and open Main River network located onsite known as the Nor Beck Tributary Link. The culverted Main River crosses the development site from the north to the south and flows in a southerly direction before outfalling into Nor Beck along with the Nor Beck Extension. The Main River is shown to be open channel adjacent to the southern boundary of the site. Due to the proximity of the Main River and existing ground levels onsite, the potential fluvial flood risk is understood to be medium to high. Consultations with the EA have therefore been undertaken and confirmed that the EA do hold an existing model for the Nor Beck Tributary Link. Details of the flood risk to site are discussed subsequently in further detail.
Climate Change		🟡	Medium to High	The impacts of climate change on rainfall intensity and frequency are likely to result in increased flood risk. The potential impacts associated with climate change is likely to have an impact on the level of mitigation required to ensure development can be safeguarded for its design life. As part of the existing modelling undertaken by the EA, up-to-date Climate Change has been accounted for and is discussed further subsequently. It is however understood that the risk to site from Climate Change in Medium to High given the onsite presence of the Nor Beck Tributary Link.

Fluvial Flood Risk

Information relating to flood risk has been obtained from the Environment Agency (EA) and from the Gov.uk website, which has identified the site is located within Flood Zone 1, 2 and 3, as shown in Figure 3. Flood Zone 1 is an area considered to be at little or no fluvial flood risk. Food Zone 2 is an area at risk in the undefended 1 in 1000yr return period event. Flood Zone 3 is an area at risk in the undefended 1 in 100yr fluvial (or 1 in 200yr tidal) return period event. Given the level of flood risk to the site from the onsite Main River, consultations with the EA have been undertaken to obtain the most up-to-date flood risk information to allow a better understanding of the potential flood risk at the site to be gained.

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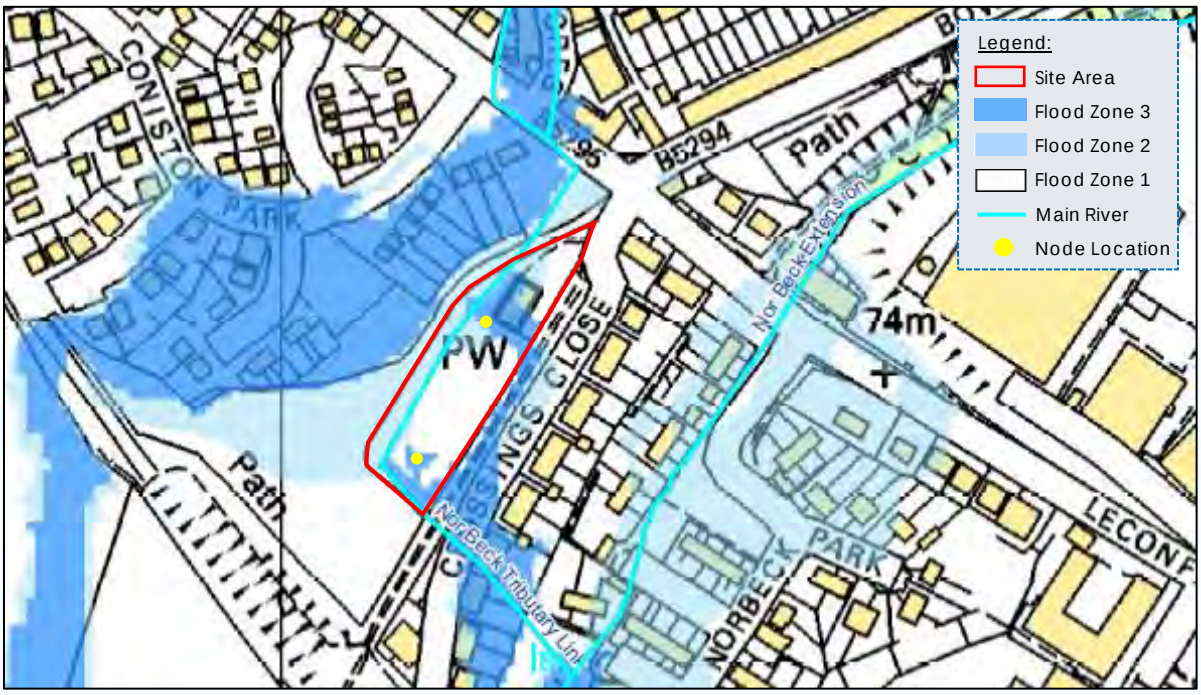

Figure 3: Flood Map for Planning Extract (EA, 2021)

Environment Agency Data Review

The EA has been consulted in order to better understand flood risk at the sites and have provided predicted onsite top water levels for various return period modelled events in both undefended and defended fluvial scenarios, including allowances for Climate Change (CC). This scoping exercise is therefore based on the provided top water levels data taken from the Ehen Study 2015 only (Appendix C).

Undefended Flood Risk

As previously discussed, the EA have provided undefended onsite top water levels (TWL) for a range of modelled events. When the onsite TWL in the undefended and defended scenarios are compared with each other, the potential flood risk to the site has been identified to be reduced up to 10mm in the defended events.

It is therefore understood that the existing defences do not have a substantial impact to the potential flood risk posed to the development site. This scoping exercise considers the real-world scenarios (defended scenarios) when proposing specific mitigation measures for safeguarding future development. The onsite TWL in the undefended scenarios have however been included within Appendix C for completeness.

Defended Flood Risk

The onsite TWL in the defended scenarios, provided by the EA, have been summarised in Table 3 below. The EA have provided two onsite TWL from two separate onsite locations identified within Figure 3. The first TWL has been taken from a flood risk area located adjacent to the existing onsite chapel and the second TWL has been taken from a flood risk

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area located adjacent to the southern boundary of the site where the open channel of the Main River is also located. The full mapping data sets have been included within Appendix C for completeness.

Table 3: Defended Fluvial Onsite Top Water Levels (EA, 2021).

	Return Period Events (mAOD)				
Defended Fluvial	1 in 100yr	1 in 1000yr	1 in 100yr plus CC (30%)	1 in 100yr plus CC (35%)	1 in 100yr plus CC (70%)
Onsite TWL	73.13	73.16	73.15	73.17	73.18
Onsite TWL	71.79	71.82	71.81	71.81	71.82

When the onsite TWL in the 1 in 100yr return period event (73.13mAOD and 71.79mAOD), is compared to the existing onsite ground levels identified by the topographic survey (73.0mAOD and 71.5mAOD). The site is identified to be at risk of flood depths of up to 130mm adjacent to the existing onsite chapel and 290mm adjacent to the southern boundary of the site where the open channel of the Main River is also located.

When the onsite TWL in the more extreme 1 in 1000yr return period event (73.16mAOD and 71.82mAOD), is compared to the existing onsite ground levels identified by the topographic survey (73.0mAOD and 71.5mAOD). The site is identified to be at risk of flood depths of up to 160mm adjacent to the existing onsite chapel and 320mm adjacent to the southern boundary of the site where the open channel of the Main River is also located.

Climate Change Flood Risk

As part of this assessment however, we have reviewed the current Climate Change Allowance for the site and identified, for more vulnerable development, the central allowance should be applied to Main Rivers located within the South-West Lakes Management Catchment area.

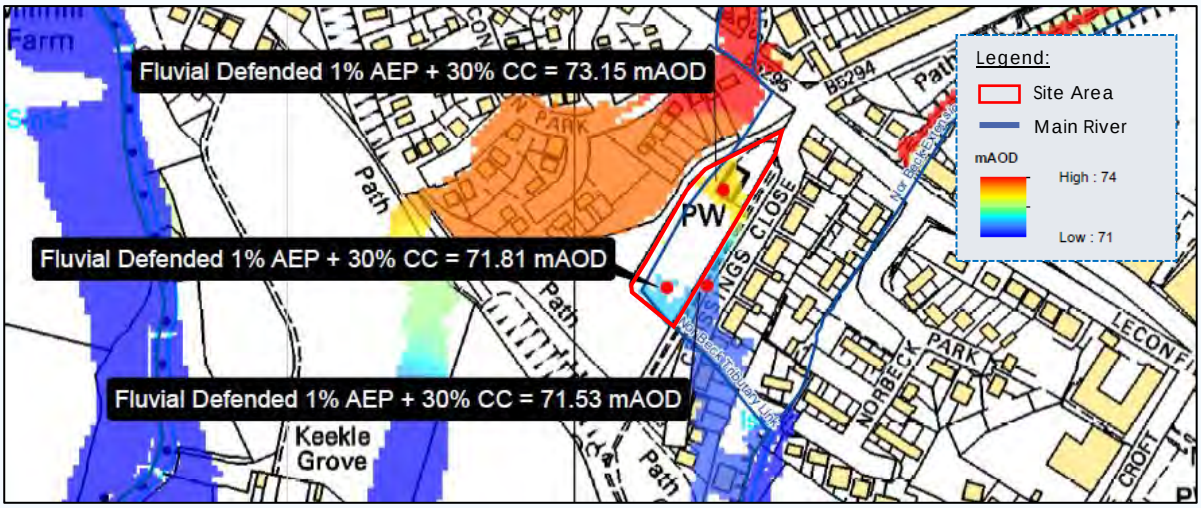

Figure 4: Fluvial Defended 1 in 100yr Flood Risk Scenario plus 30% Climate Change (EA, 2021)

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The central allowance for the peak river flow allowance has been identified to be 30%. The information provided by the EA therefore includes for the most up-to-date Climate Change (CC) allowance in accordance with planning policy, as shown within Figure 4.

When the onsite TWL in the 1 in 100yr plus 30% CC (73.15mAOD and 71.81mAOD), which is also considered to be the design event, is compared to the existing onsite ground levels identified by the topographic survey (73.0mAOD and 71.5mAOD). The site is identified to be at risk of flood depths of up to 150mm adjacent to the existing onsite chapel and 310mm adjacent to the southern boundary of the site where the open channel of the Main River is also located.

Development Constraints and Recommendations

As discussed previously, the PPG identifies those certain types of development would not be acceptable if located in high-risk areas. Policy also notes that justification for locating certain development within the predicted floodplain extents would be required. It is understood that the planning proposals are for residential development. In terms of planning policy, residential development is classified as 'more vulnerable' development. The development site will therefore need to undertake and be supported by the Sequential and Exception Test based on the site's location within Flood Zone 2 and 3.

The typical requirement for safeguarding residential development is to raise Finished Floor Levels (FFL) of the properties above the design event (1 in 100yr plus 30% CC) to ensure it they remain safe and flood free. It is also recommended that internal resilience measures are incorporated inside the properties. These measures will be discussed further as part of a full Flood Risk Assessment.

It should also be noted given the sites location partly within Flood Zone 3 and not within an area that currently benefits from defences, policy states that any alterations within Flood Zone 3 need to be supported, with evidence, that flood risk elsewhere would not occur as a result of the development. If the proposed development results in any increase flood risk elsewhere, then there is a requirement to provide flood storage compensation within Flood Zone 1 on land in control of the developer.

Given the proposed flood risk to site and the historical record of onsite flooding (identified by the LLFA), it recommended that additional hydraulic modelling is undertaken to identify the flood risk to site during a blockage event and to assess if the development would cause flooding to the neighbouring areas resulting in the need for flood storage compensation. A hydraulic modelling fee proposal has been provided within Appendix F, to provide clarity on what would be included as part of a hydraulic modelling assessment and a price estimation.

Once the modelling has been undertaken and the potential risk to site has been assessed and identified can be mitigated for in line with current policy, a full Flood Risk and Drainage Management Strategy report can then be undertaken to support the planning application.

Furthermore, in accordance with the Environment Agency there is a requirement to maintain no-build offsets from culverted and open channel Main Rivers. The EA will therefore

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require an 8m offset from the top of bank/the centreline of the onsite Main River (Nor Beck Tributary Link), into the development site for future maintenance purposes. The offset will be required to provide clear and unimpeded access, meaning no fencing, privately owned land or buildings can be located within this space. Given the existing planning layout it is recommended that early discussion with the EA is undertaken at an early stage to discuss their specific offset requirements. The EA will also require the developer to have an Environmental Permit to carry out works within 16m of a Main River.

Conclusion

This Flood Risk and Hydraulic Modelling Scoping Exercise has identified the key development constraints in terms of flood risk based on the available information. As previously discussed, given the proposed flood risk to site and the historical records of blockage identified by the LLFA, it is proposed that the next stage should be to undertake additional Hydraulic Modelling of Nor Beck and the onsite Nor Beck Tributary Link.

The hydraulic modelling will be able to more accurately identify the potential flood risk to the site and identify the requirements for flood storage compensation. Once this has been undertaken a full Flood Risk and Drainage Management Strategy report can then be undertaken to support the planning application, should the site pass the Sequential and Exemption Tests.

I trust that the above information is clearly identified the risks and required approach, however if you have any further queries, please do not hesitate to contact us.

Yours sincerely

Megan Berry *BSc (Hons) MCIWEM*
Flood Risk Analyst

Attached:

Appendix A – Location Plan
Appendix B – Topographic Survey
Appendix C – EA Correspondence & Data
Appendix D – Cumbria County Council & Copeland Borough Council Correspondence
Appendix E – UU Correspondence
Appendix F – Hydraulic Modelling Fee Proposal
Appendix G – Flood Risk Assessment and Drainage Management Strategy Fee Proposal

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Welsh Road, Sealand
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APPENDIX A – LOCATION PLAN

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LOCATION PLAN

Whitehaven Road, Cleator Moor, CA25 5PY

OS X (Eastings)	301005
OS Y (Northings)	515520
Nat Grid	NY010155 / NY0100515520
Nearest Post Code	CA25 5PY
Lat (OSGB36)	N54:31:31 (54.5251511108862)
Long (OSGB36)	W3:31:47 (-3.5297541564898722)
Lat, Long (OSGB36)	54.5251511108862, -3.5297541564898722
Lat (WGS84)	N54:31:31 (54.52525838769935)
Long (WGS84)	W3:31:52 (-3.531077221833526)
Lat, Long (WGS84)	54.52525838769935, -3.531077221833526

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APPENDIX B – TOPOGRAPHIC SURVEY

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LEGEND

Buildings
Wall
Kerb line
Line marking
Drop kerb
Centre line
Bank Top
Overhead Cable
Concrete edge
Tarmac edge
Grass verge
Canopy/Overhang
Verge
Bank Bottom
Station and Name Station Level
Tree / Bush / Sapling
Area of Undergrowth
Hedge
Ridge Level
Eaves Level
Flat Roof Level
Gate
Interwoven
Iron Railings
Wire Mesh
Post & Rail
Post & Wire
Chain Link
Wooden Panels
Concrete Panels
Steel Palisade

IC	Inspection chamber	Boll	Bollard
PInv	Pipe invert	IB	Illuminated bollard
Gy	Gully	Bin	Rubbish bin
Dp	Down pipe	Vp	Vent pipe
Pipe	Pipe above ground	Grl	Ground light
MH	Manhole	Lbox	Letter box
WL	Water level	Sty	Stile
Fl	Flood light	IFL	Internal floor level
Lp	Lamp post	THL	Threshold level
Tp	Telegraph post	Sp	Sign post
Ep	Electricity post	TH	Trialhole
Tl	Traffic light	BH	Borehole
Bus	Bus stop	ELEC	Electric
Sv	Stop valve	BT	British Telecom
St	Stop tap	C'box	Control box
Er	Earth rod	IC	Inspection chamber
Wm	Water meter	R/wall	Retaining wall
Gv	Gas valve	UTL	Unable to lift
Av	Air valve	TCL	Tree canopy level
Wo	Wash out	G:	Girth
Re	Rodding eye	MB	Multi Bowl
BB	Belisha beacon	Stmp	Tree Stump
CTV	Cable tv	CL:	Cover level
Mkr	Marker post	IL:	Invert level
Gmkr	Gas marker post		
So	Soffit		

NOTES

This plan should only be used for its original purpose. Axis Surveys accepts no responsibility for this plan if supplied to any party other than the original client. Do not scale, all dimensions should be checked on site prior to design and construction.

Drainage information (where applicable) has been visually inspected from the surface and therefore no allowance has been made for any sub surface entry into manholes, chambers or voids. Therefore any details relating to depths, sizes, ETC will be approximate only.

The contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts.

Should there be any conflict between the details indicated on this drawing and those indicated on other drawings, the engineer should be informed prior to construction on site.

It is important to note that the same accuracies implied by the plotting scale are equally applicable to digital data supplied for CAD

Every effort if made to identify all visible above ground features, however is it should be borne in mind that there may be items obscured at the time of survey.

Visible features in the vicinity if the boundaries, as shown on this survey may not represent the extent of legally conveyed ownership.

THIS SURVEY HAS BEEN ORIENTATED TO THE ORDNANCE SURVEY (O.S) NATIONAL GRID (OSGB36) VIA A GLOBAL POSITION SYSTEM (GPS) AND THE O.S. ACTIVE NETWORK (OS NET).

A TRUE OSGB36 COORDINATE HAS BEEN ESTABLISHED NEAR TO THE SITE CENTRE VIA A TRANSFORMATION USING THE OSTN02 & OSGM02 TRANSFORMATION MODELS. THE SURVEY HAS BEEN CORRELATED TO THIS POINT AND A FURTHER ONE OR MORE OSGB36 POINTS ESTABLISHED TO CREATE A TRUE O.S. BEARING FOR ANGLE ORIENTATION.

SURVEY STATION INFORMATION

Station	Easting	Northing	Level
AX1	301150.265	515568.131	75.495
AX2	301129.009	515527.706	73.546
AX3	301100.679	515480.732	71.630
AX4	301074.354	515437.586	71.680

0 1 2 3 4 5 10 15 20m

axis surveys

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info@axis-surveys.com

www.axis-surveys.com

Laurus House, First Avenue, Centrum 100
Burton-on-Trent, DE14 2WH

CLIENT Elite Ecology

PROJECT St Bega's Chapel
Whitehaven Road
Cleator Moor

TITLE Topographical Survey

SCALE @A0	1:200	DATE	August 2021
DRAWN	LB	CHECKED	MB
REF NO.	3903	STATUS FINAL	SHEET n/a

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CONSULTING ENGINEERS

APPENDIX C – EA CORRESPONDENCE & DATA

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Megan Berry

From: Hannah Buchanan
Sent: 06 October 2021 09:28
To: Megan Berry; Richard Nicholas
Subject: FW: CL232400KR : Products 4, 5, 6 and 7
Attachments: CL232400 - Whitehaven Rd Product 4.pdf

From: CMBLNC Info Requests
Sent: 06 October 2021 08:24:11 (UTC) Coordinated Universal Time
To: Hannah Buchanan
Subject: CL232400KR : Products 4, 5, 6 and 7

Dear Hannah

Enquiry regarding product data

Thank you for your enquiry which was received on 6 September 2021. Apologies for the delay.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

Please see the Product 4 attached and response below for: Cleator Moor.

- The fluvial data has been taken from the Ehen 2015 study. Updated climate change data, including a 30%, 35% and 70% increase in river flows, have been provided from the Ehen Study 2020 climate change update. New climate change allowances can be checked on the following website: www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances. **Please note this guidance was updated on 20th July 2021.** **Please note** that the Node point IDs within the Fluvial levels and flows table (pages 4-9) are filtered in alphabetical/numerical order and **are not** in order of how the node point IDs feature on the fluvial levels and flows map on page 3, i.e. upstream to downstream.

- For all queries relating to flooding from surface water, ordinary watercourses and groundwater flooding, please contact the Lead Local Flood Authority Cumbria County Council.

- Surface Water Maps can be viewed online at https://flood-warning-information.service.gov.uk/long-term-flood-risk/map.

- Please find the Products 5, 6 & 7 at this link: https://ea.sharefile.com/d-s705021584ac94176b47cc0e52bbb0866

  (Please download on receipt as the link will expire on 15th October 2021). This data is being supplied under the terms of our Conditional Licence.

There are no flood defences at this location although there is a culvert which runs underneath the site boundary. The information for the culvert is available if required.

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.

Thanks

Karen

Karen Rooke
Customers and Engagement Officer, Cumbria and Lancashire
Environment Agency | Ghyll Mount, Gillan Way, Penrith 40 Business Park, Penrith, Cumbria, CA11 9BP

inforequests.cmblnc@environment-agency.gov.uk

From: Hannah Buchanan
Sent: 06 September 2021 16:13
To: CMBLNC Info Request
Subject: Products 4, 5, 6 and 7

To whom it may concern,

Whitehaven Road, Cleator Moor, CA25 5PY

Please could you confirm whether you have any information (Products 4, 5, 6 and 7) that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the above site (location plan attached), including details of historical flooding and any predicted flood water levels; this would be greatly appreciated. If there are any specific requirements that you require in a scope of works for this site, please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards,

Hannah Buchanan *BSc (Hons)*
Graduate Flood Risk Analyst

BETTS HYDRO
Consulting Engineers
Old Marsh Farm Barns. Welsh Road, Sealand, Flintshire, CH5 2LY
Cheste

CIVIL | STRUCTURAL | GEO-ENVIRONMENTAL | HYDROLOGY | FLOOD RISK MANAGEMENT
SUDS | STRUCTURAL SURVEYS | PARTY WALL DUTIES | INFILTRATION | GEOTECHNICAL

email and its attachments for viruses. But you should still check any attachment before opening it. We may have to make this message and any reply to it public if asked to under the Freedom of Information Act, Data Protection Act or for litigation. Email messages and attachments sent to or from any Environment Agency address may also be accessed by someone other than the sender or recipient, for business purposes.

NATIONAL FLOOD MAPPING

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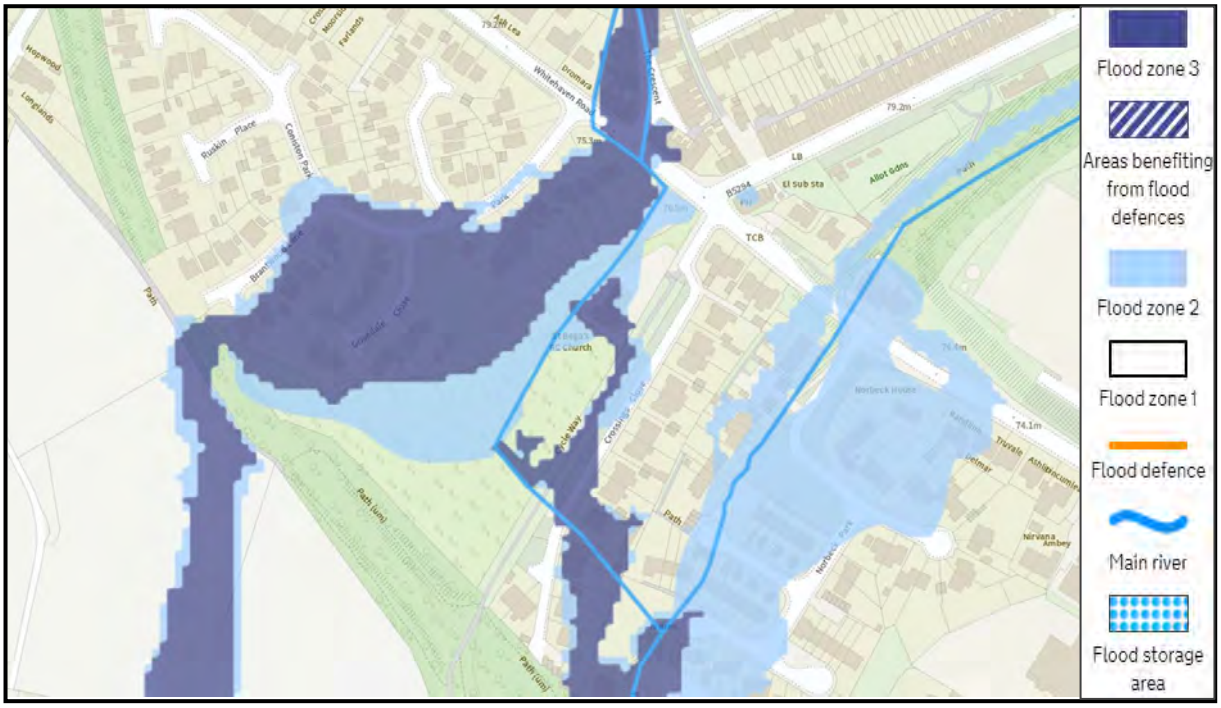
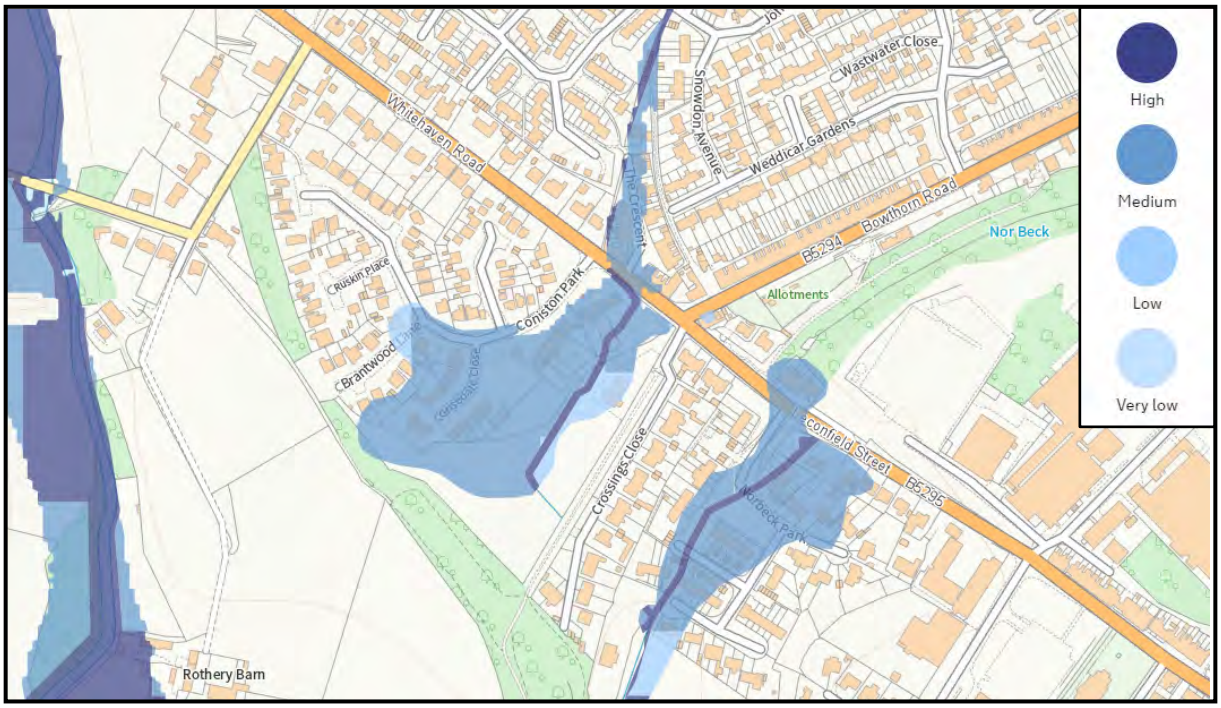
Flood Map for Planning



Long Term Flood Risk – Rivers or Sea



NATIONAL FLOOD MAPPING

BETTS HYDRO
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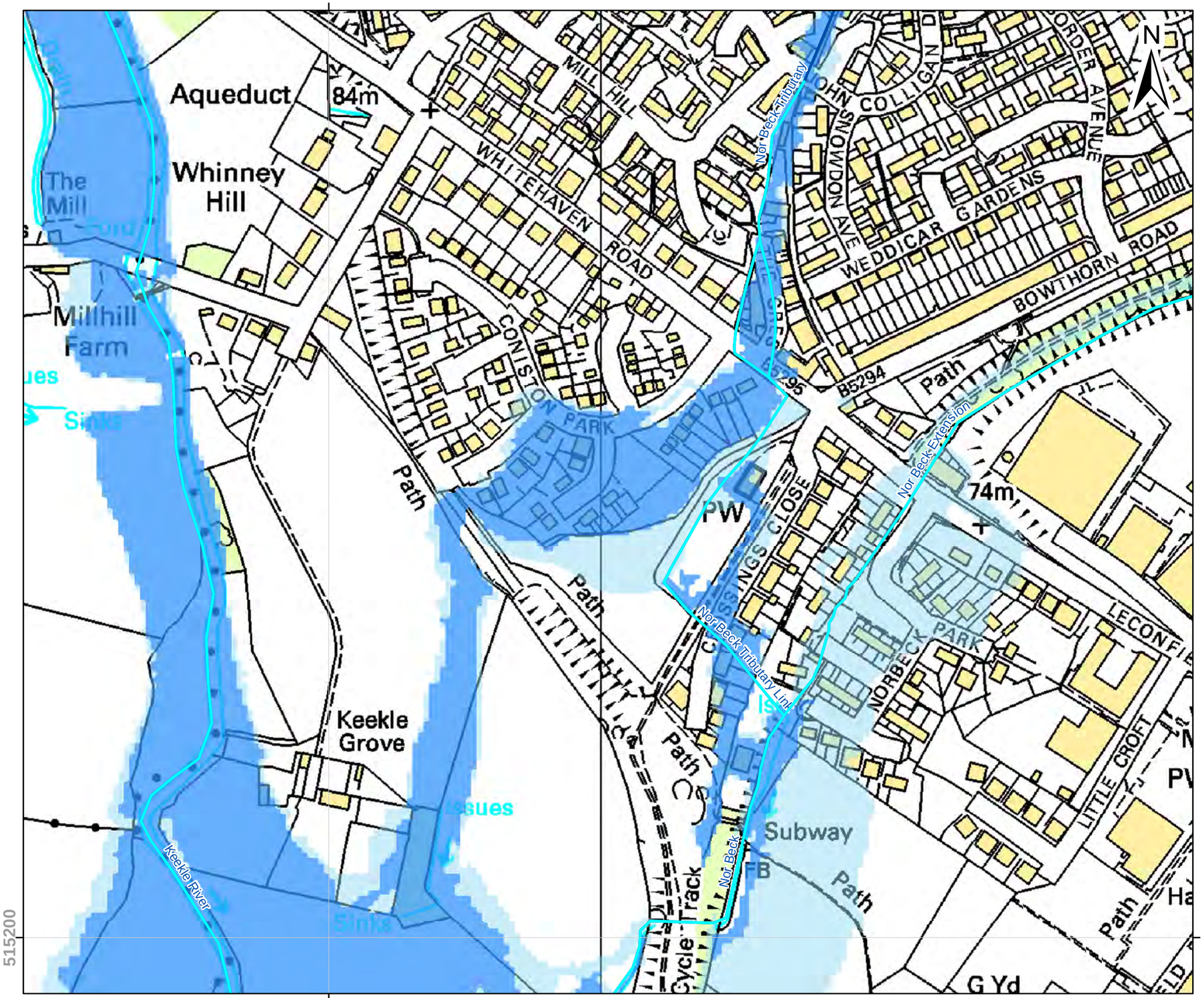
Long Term Flood Risk – Surface Water

Long Term Flood Risk - Reservoirs

Flood Zones Map: Whitehaven Road, Cleator Moor, CA25 5PY

Produced: 14 September 2021
Our Ref: CL232400
NGR: NY0111215532



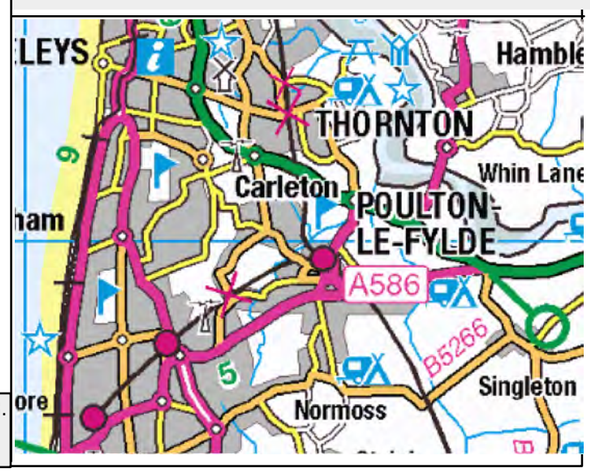
Key

- Main River
- Areas Benefitting from Defences
- Flood Zone 3
- Flood Zone 2

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 0.5% or greater chance of happening each year
- or from a river with a 1.0% or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to 0.1% chance of occurring each year.

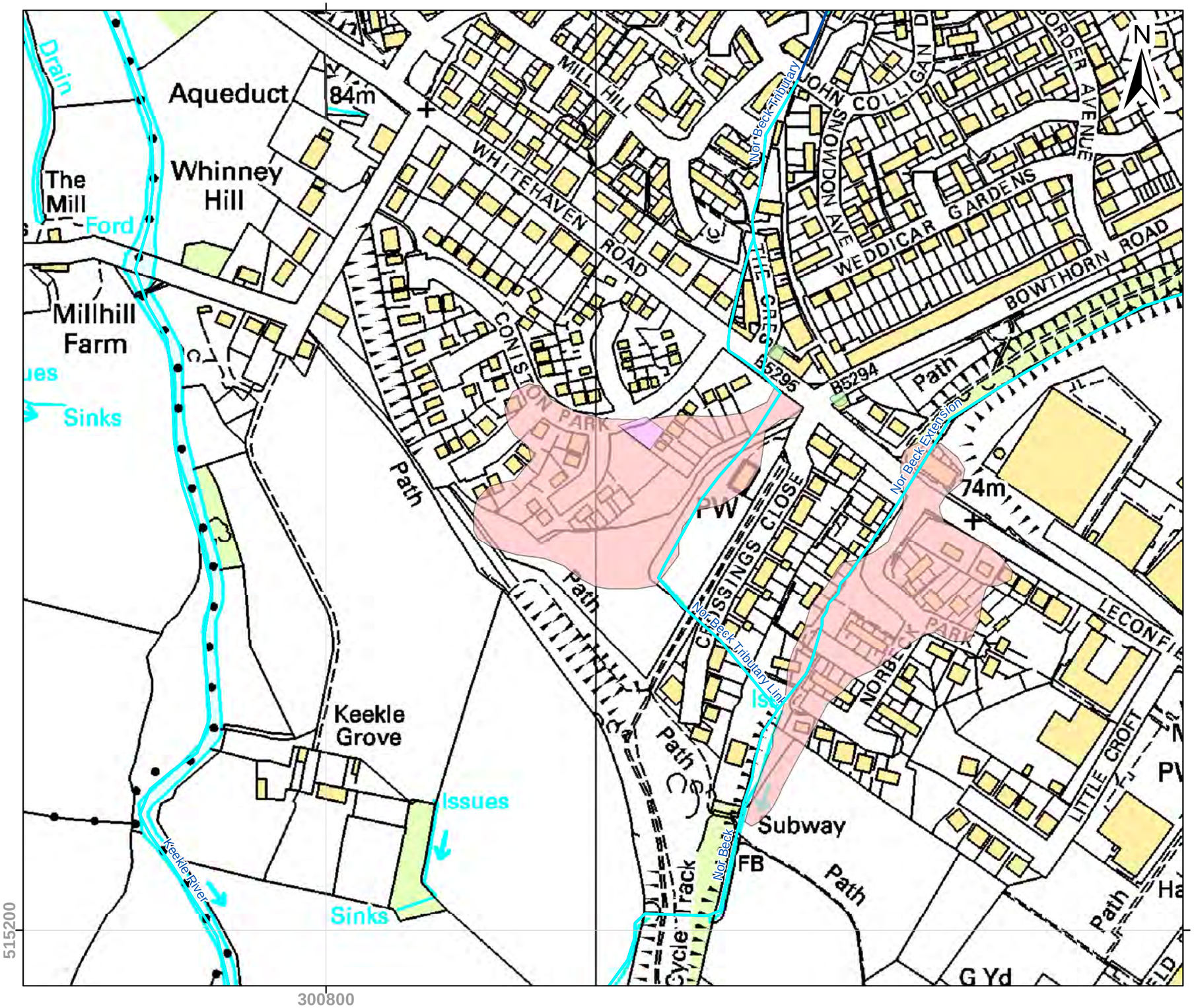
ABDs (Areas Benefiting from Defences) show the area benefiting from defences during a 0.5% tidal, or 1.0% fluvial flood event.



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

Flood History Map: Whitehaven Road, Cleator Moor, CA25 5PY

Produced: 14 September 2021
Our Ref: CL232400
NGR: NY0111215532



Key

Main River

11/10/2017

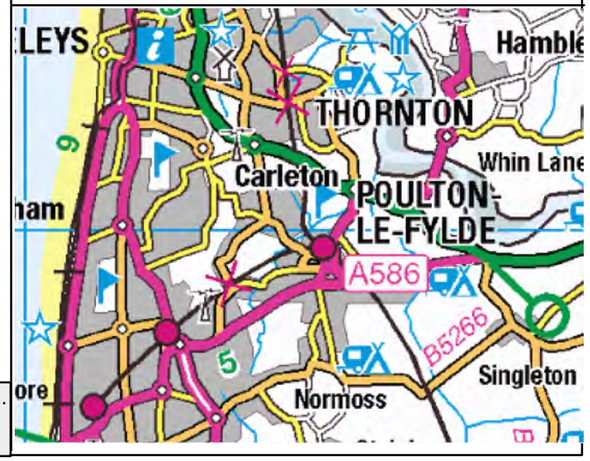
11/10/2005

05/11/1999

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 0.5% or greater chance of happening each year
- or from a river with a 1.0% or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to 0.1% chance of occurring each year.

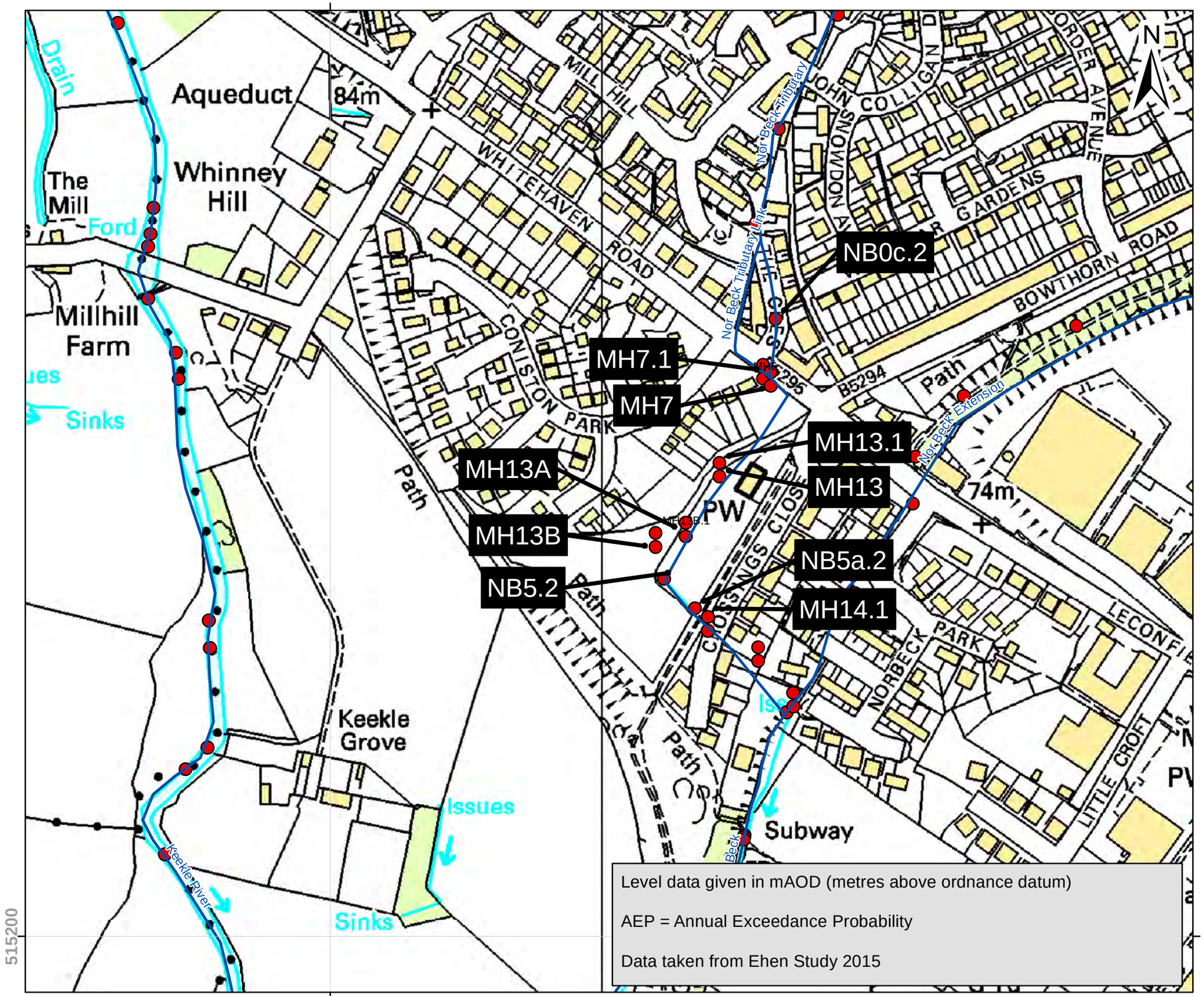
ABDs (Areas Benefiting from Defences) show the area benefiting from defences during a 0.5% tidal, or 1.0% fluvial flood event.



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

Fluvial Levels and Flows Map: Whitehaven Road, Cleator Moor, CA25 5PY

Produced: 14 September 2021
Our Ref: CL232400
NGR: NY0111215532



Level data given in mAOD (metres above ordnance datum)

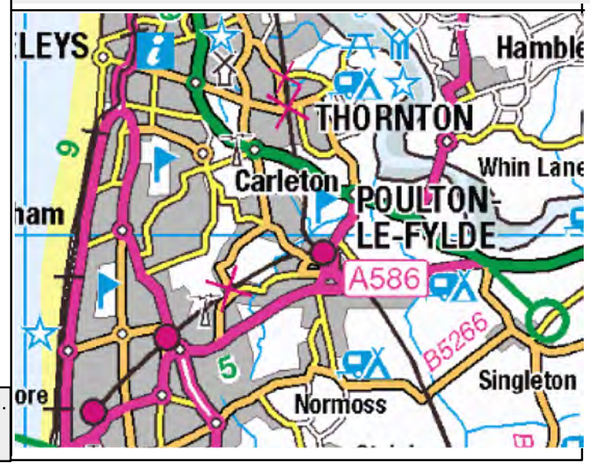
AEP = Annual Exceedance Probability

Data taken from Ehen Study 2015

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 0.5% or greater chance of happening each year
- or from a river with a 1.0% or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to 0.1% chance of occurring each year.

ABDs (Areas Benefiting from Defences) show the area benefiting from defences during a 0.5% tidal, or 1.0% fluvial flood event.



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

Node Point ID	Defended (D), Undefended (UD), Climate Change (CC)	Return Period (years)	Water Level (mAOD)	Flow (Cumecs)
MH13	Ehen2015_U	5	73.30	0.48
MH13	Ehen2015_D	5	73.30	0.48
MH13	Ehen2015_D	10	73.32	0.48
MH13	Ehen2015_U	10	73.32	0.48
MH13	Ehen2015_D	15	73.32	0.48
MH13	Ehen2015_U	20	73.33	0.48
MH13	Ehen2015_D	20	73.33	0.48
MH13	Ehen2015_U	25	73.33	0.48
MH13	Ehen2015_D	25	73.33	0.48
MH13	Ehen2015_D	30	73.33	0.48
MH13	Ehen2015_U	30	73.33	0.48
MH13	Ehen2015_D	40	73.34	0.48
MH13	Ehen2015_D	50	73.35	0.48
MH13	Ehen2015_U	50	73.35	0.48
MH13	Ehen2015_D	75	73.35	0.48
MH13	Ehen2015_U	75	73.35	0.48
MH13	Ehen2015_U	100	73.36	0.48
MH13	Ehen2015_D	100	73.36	0.48
MH13	Ehen2015_U_35%CC	100	73.39	0.47
MH13	Ehen2015_U_30%CC	100	73.39	0.47
MH13	Ehen2015_U_70%CC	100	73.42	0.47
MH13	Ehen2015_D_35%CC	100	73.39	0.47
MH13	Ehen2015_D_30%CC	100	73.39	0.47
MH13	Ehen2015_D_70%CC	100	73.42	0.47
MH13	Ehen2015_U	200	73.38	0.48
MH13	Ehen2015_D	200	73.38	0.48
MH13	Ehen2015_D	500	73.40	0.48
MH13	Ehen2015_D	1000	73.42	0.48
MH13	Ehen2015_U	1000	73.42	0.48
MH13.1	Ehen2015_U	5	73.14	0.00
MH13.1	Ehen2015_D	5	73.14	0.00
MH13.1	Ehen2015_D	10	73.14	0.00
MH13.1	Ehen2015_U	10	73.14	0.00
MH13.1	Ehen2015_D	15	73.15	0.00
MH13.1	Ehen2015_U	20	73.15	0.00
MH13.1	Ehen2015_D	20	73.15	0.00
MH13.1	Ehen2015_U	25	73.15	0.00
MH13.1	Ehen2015_D	25	73.15	0.00
MH13.1	Ehen2015_D	30	73.15	0.00
MH13.1	Ehen2015_U	30	73.15	0.00
MH13.1	Ehen2015_D	40	73.15	0.00
MH13.1	Ehen2015_D	50	73.16	0.00
MH13.1	Ehen2015_U	50	73.16	0.00
MH13.1	Ehen2015_D	75	73.16	0.00
MH13.1	Ehen2015_U	75	73.16	0.00
MH13.1	Ehen2015_U	100	73.16	0.00

MH13.1	Ehen2015_D	100	73.16	0.00
MH13.1	Ehen2015_U_35%CC	100	73.18	0.00
MH13.1	Ehen2015_U_30%CC	100	73.17	0.00
MH13.1	Ehen2015_U_70%CC	100	73.19	0.00
MH13.1	Ehen2015_D_35%CC	100	73.18	0.00
MH13.1	Ehen2015_D_30%CC	100	73.17	0.00
MH13.1	Ehen2015_D_70%CC	100	73.19	0.00
MH13.1	Ehen2015_U	200	73.17	0.00
MH13.1	Ehen2015_D	200	73.17	0.00
MH13.1	Ehen2015_D	500	73.18	0.00
MH13.1	Ehen2015_D	1000	73.19	0.00
MH13.1	Ehen2015_U	1000	73.19	0.00
MH13A	Ehen2015_U	5	72.65	0.50
MH13A	Ehen2015_D	5	72.65	0.50
MH13A	Ehen2015_D	10	72.67	0.50
MH13A	Ehen2015_U	10	72.67	0.50
MH13A	Ehen2015_D	15	72.68	0.50
MH13A	Ehen2015_U	20	72.69	0.50
MH13A	Ehen2015_D	20	72.69	0.50
MH13A	Ehen2015_U	25	72.70	0.50
MH13A	Ehen2015_D	25	72.70	0.50
MH13A	Ehen2015_D	30	72.71	0.50
MH13A	Ehen2015_U	30	72.71	0.50
MH13A	Ehen2015_D	40	72.72	0.50
MH13A	Ehen2015_D	50	72.73	0.50
MH13A	Ehen2015_U	50	72.73	0.50
MH13A	Ehen2015_D	75	72.75	0.50
MH13A	Ehen2015_U	75	72.75	0.50
MH13A	Ehen2015_U	100	72.76	0.50
MH13A	Ehen2015_D	100	72.76	0.50
MH13A	Ehen2015_U_35%CC	100	72.83	0.49
MH13A	Ehen2015_U_30%CC	100	72.82	0.49
MH13A	Ehen2015_U_70%CC	100	72.91	0.49
MH13A	Ehen2015_D_35%CC	100	72.83	0.49
MH13A	Ehen2015_D_30%CC	100	72.82	0.49
MH13A	Ehen2015_D_70%CC	100	72.91	0.49
MH13A	Ehen2015_U	200	72.79	0.50
MH13A	Ehen2015_D	200	72.79	0.50
MH13A	Ehen2015_D	500	72.85	0.50
MH13A	Ehen2015_D	1000	72.90	0.50
MH13A	Ehen2015_U	1000	72.90	0.50
MH13B	Ehen2015_U	5	72.23	0.52
MH13B	Ehen2015_D	5	72.23	0.52
MH13B	Ehen2015_D	10	72.26	0.52
MH13B	Ehen2015_U	10	72.26	0.52
MH13B	Ehen2015_D	15	72.27	0.52
MH13B	Ehen2015_U	20	72.28	0.52
MH13B	Ehen2015_D	20	72.28	0.52
MH13B	Ehen2015_U	25	72.29	0.52

MH13B	Ehen2015_D	25	72.29	0.52
MH13B	Ehen2015_D	30	72.29	0.52
MH13B	Ehen2015_U	30	72.29	0.52
MH13B	Ehen2015_D	40	72.30	0.52
MH13B	Ehen2015_D	50	72.31	0.52
MH13B	Ehen2015_U	50	72.31	0.52
MH13B	Ehen2015_D	75	72.32	0.52
MH13B	Ehen2015_U	75	72.32	0.52
MH13B	Ehen2015_U	100	72.34	0.52
MH13B	Ehen2015_D	100	72.34	0.52
MH13B	Ehen2015_U_35%CC	100	72.40	0.54
MH13B	Ehen2015_U_30%CC	100	72.39	0.53
MH13B	Ehen2015_U_70%CC	100	72.47	0.56
MH13B	Ehen2015_D_35%CC	100	72.40	0.54
MH13B	Ehen2015_D_30%CC	100	72.39	0.53
MH13B	Ehen2015_D_70%CC	100	72.47	0.56
MH13B	Ehen2015_U	200	72.37	0.52
MH13B	Ehen2015_D	200	72.37	0.52
MH13B	Ehen2015_D	500	72.42	0.54
MH13B	Ehen2015_D	1000	72.46	0.56
MH13B	Ehen2015_U	1000	72.46	0.56
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MH14.1	Ehen2015_D	5	71.44	0.00
MH14.1	Ehen2015_D	10	71.44	0.00
MH14.1	Ehen2015_U	10	71.44	0.00
MH14.1	Ehen2015_D	15	71.44	0.00
MH14.1	Ehen2015_U	20	71.44	0.00
MH14.1	Ehen2015_D	20	71.44	0.00
MH14.1	Ehen2015_U	25	71.44	0.00
MH14.1	Ehen2015_D	25	71.44	0.00
MH14.1	Ehen2015_D	30	71.44	0.00
MH14.1	Ehen2015_U	30	71.44	0.00
MH14.1	Ehen2015_D	40	71.44	0.00
MH14.1	Ehen2015_D	50	71.44	0.00
MH14.1	Ehen2015_U	50	71.44	0.00
MH14.1	Ehen2015_D	75	71.44	0.00
MH14.1	Ehen2015_U	75	71.44	0.00
MH14.1	Ehen2015_U	100	71.44	0.00
MH14.1	Ehen2015_D	100	71.44	0.00
MH14.1	Ehen2015_U_35%CC	100	71.44	0.00
MH14.1	Ehen2015_U_30%CC	100	71.44	0.00
MH14.1	Ehen2015_U_70%CC	100	71.44	0.00
MH14.1	Ehen2015_D_35%CC	100	71.44	0.00
MH14.1	Ehen2015_D_30%CC	100	71.44	0.00
MH14.1	Ehen2015_D_70%CC	100	71.44	0.00
MH14.1	Ehen2015_U	200	71.44	0.00
MH14.1	Ehen2015_D	200	71.44	0.00
MH14.1	Ehen2015_D	500	71.44	0.00
MH14.1	Ehen2015_D	1000	71.44	0.00

MH14.1	Ehen2015_U	1000	71.44	0.00
MH7	Ehen2015_U	5	74.69	0.49
MH7	Ehen2015_D	5	74.69	0.49
MH7	Ehen2015_D	10	74.71	0.49
MH7	Ehen2015_U	10	74.71	0.49
MH7	Ehen2015_D	15	74.73	0.49
MH7	Ehen2015_U	20	74.74	0.50
MH7	Ehen2015_D	20	74.74	0.50
MH7	Ehen2015_U	25	74.75	0.50
MH7	Ehen2015_D	25	74.75	0.50
MH7	Ehen2015_D	30	74.75	0.50
MH7	Ehen2015_U	30	74.75	0.50
MH7	Ehen2015_D	40	74.77	0.50
MH7	Ehen2015_D	50	74.78	0.50
MH7	Ehen2015_U	50	74.78	0.50
MH7	Ehen2015_D	75	74.79	0.50
MH7	Ehen2015_U	75	74.79	0.50
MH7	Ehen2015_U	100	74.81	0.50
MH7	Ehen2015_D	100	74.81	0.50
MH7	Ehen2015_U_35%CC	100	74.88	0.51
MH7	Ehen2015_U_30%CC	100	74.87	0.51
MH7	Ehen2015_U_70%CC	100	74.93	0.52
MH7	Ehen2015_D_35%CC	100	74.88	0.51
MH7	Ehen2015_D_30%CC	100	74.87	0.51
MH7	Ehen2015_D_70%CC	100	74.93	0.52
MH7	Ehen2015_U	200	74.84	0.51
MH7	Ehen2015_D	200	74.84	0.51
MH7	Ehen2015_D	500	74.90	0.51
MH7	Ehen2015_D	1000	74.93	0.52
MH7	Ehen2015_U	1000	74.93	0.52
MH7.1	Ehen2015_U	5	74.88	0.00
MH7.1	Ehen2015_D	5	74.88	0.00
MH7.1	Ehen2015_D	10	74.88	0.00
MH7.1	Ehen2015_U	10	74.88	0.00
MH7.1	Ehen2015_D	15	74.88	0.00
MH7.1	Ehen2015_U	20	74.88	0.00
MH7.1	Ehen2015_D	20	74.88	0.00
MH7.1	Ehen2015_U	25	74.88	0.00
MH7.1	Ehen2015_D	25	74.88	0.00
MH7.1	Ehen2015_D	30	74.88	0.00
MH7.1	Ehen2015_U	30	74.88	0.00
MH7.1	Ehen2015_D	40	74.88	0.00
MH7.1	Ehen2015_D	50	74.88	0.00
MH7.1	Ehen2015_U	50	74.88	0.00
MH7.1	Ehen2015_D	75	74.88	0.00
MH7.1	Ehen2015_U	75	74.88	0.00
MH7.1	Ehen2015_U	100	74.88	0.00
MH7.1	Ehen2015_D	100	74.88	0.00
MH7.1	Ehen2015_U_35%CC	100	74.88	0.00

MH7.1	Ehen2015_U_30%CC	100	74.88	0.00
MH7.1	Ehen2015_U_70%CC	100	74.88	0.00
MH7.1	Ehen2015_D_35%CC	100	74.88	0.00
MH7.1	Ehen2015_D_30%CC	100	74.88	0.00
MH7.1	Ehen2015_D_70%CC	100	74.88	0.00
MH7.1	Ehen2015_U	200	74.88	0.00
MH7.1	Ehen2015_D	200	74.88	0.00
MH7.1	Ehen2015_D	500	74.88	0.00
MH7.1	Ehen2015_D	1000	74.88	0.00
MH7.1	Ehen2015_U	1000	74.88	0.00
NB0c.2	Ehen2015_U	5	76.32	0.47
NB0c.2	Ehen2015_D	5	76.32	0.47
NB0c.2	Ehen2015_D	10	76.39	0.48
NB0c.2	Ehen2015_U	10	76.39	0.48
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NB0c.2	Ehen2015_U	30	76.50	0.49
NB0c.2	Ehen2015_D	40	76.54	0.50
NB0c.2	Ehen2015_D	50	76.57	0.50
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NB0c.2	Ehen2015_D	75	76.61	0.51
NB0c.2	Ehen2015_U	75	76.61	0.51
NB0c.2	Ehen2015_U	100	76.65	0.51
NB0c.2	Ehen2015_D	100	76.65	0.51
NB0c.2	Ehen2015_U_35%CC	100	76.90	0.54
NB0c.2	Ehen2015_U_30%CC	100	76.86	0.54
NB0c.2	Ehen2015_U_70%CC	100	77.13	0.57
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NB0c.2	Ehen2015_U	200	76.76	0.53
NB0c.2	Ehen2015_D	200	76.76	0.53
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NB0c.2	Ehen2015_U	1000	77.10	0.57
NB5.2	Ehen2015_U	5	71.75	0.53
NB5.2	Ehen2015_D	5	71.75	0.53
NB5.2	Ehen2015_D	10	71.77	0.53
NB5.2	Ehen2015_U	10	71.77	0.53
NB5.2	Ehen2015_D	15	71.77	0.53
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NB5.2	Ehen2015_D	20	71.78	0.53
NB5.2	Ehen2015_U	25	71.78	0.54
NB5.2	Ehen2015_D	25	71.78	0.54
NB5.2	Ehen2015_D	30	71.78	0.54

NB5.2	Ehen2015_U	30	71.78	0.54
NB5.2	Ehen2015_D	40	71.78	0.55
NB5.2	Ehen2015_D	50	71.79	0.56
NB5.2	Ehen2015_U	50	71.79	0.56
NB5.2	Ehen2015_D	75	71.79	0.56
NB5.2	Ehen2015_U	75	71.79	0.56
NB5.2	Ehen2015_U	100	71.80	0.57
NB5.2	Ehen2015_D	100	71.80	0.57
NB5.2	Ehen2015_U_35%CC	100	71.81	0.61
NB5.2	Ehen2015_U_30%CC	100	71.81	0.60
NB5.2	Ehen2015_U_70%CC	100	71.82	0.65
NB5.2	Ehen2015_D_35%CC	100	71.81	0.61
NB5.2	Ehen2015_D_30%CC	100	71.81	0.60
NB5.2	Ehen2015_D_70%CC	100	71.82	0.65
NB5.2	Ehen2015_U	200	71.80	0.59
NB5.2	Ehen2015_D	200	71.80	0.59
NB5.2	Ehen2015_D	500	71.81	0.62
NB5.2	Ehen2015_D	1000	71.82	0.65
NB5.2	Ehen2015_U	1000	71.82	0.65
NB5a.2	Ehen2015_U	5	71.75	0.55
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NB5a.2	Ehen2015_U	10	71.76	0.55
NB5a.2	Ehen2015_D	15	71.77	0.55
NB5a.2	Ehen2015_U	20	71.78	0.55
NB5a.2	Ehen2015_D	20	71.78	0.55
NB5a.2	Ehen2015_U	25	71.78	0.55
NB5a.2	Ehen2015_D	25	71.78	0.55
NB5a.2	Ehen2015_D	30	71.78	0.55
NB5a.2	Ehen2015_U	30	71.78	0.55
NB5a.2	Ehen2015_D	40	71.78	0.55
NB5a.2	Ehen2015_D	50	71.79	0.55
NB5a.2	Ehen2015_U	50	71.79	0.55
NB5a.2	Ehen2015_D	75	71.79	0.55
NB5a.2	Ehen2015_U	75	71.79	0.55
NB5a.2	Ehen2015_U	100	71.79	0.55
NB5a.2	Ehen2015_D	100	71.79	0.55
NB5a.2	Ehen2015_U_35%CC	100	71.81	0.55
NB5a.2	Ehen2015_U_30%CC	100	71.81	0.55
NB5a.2	Ehen2015_U_70%CC	100	71.82	0.54
NB5a.2	Ehen2015_D_35%CC	100	71.81	0.55
NB5a.2	Ehen2015_D_30%CC	100	71.81	0.55
NB5a.2	Ehen2015_D_70%CC	100	71.82	0.54
NB5a.2	Ehen2015_U	200	71.80	0.55
NB5a.2	Ehen2015_D	200	71.80	0.55
NB5a.2	Ehen2015_D	500	71.81	0.55
NB5a.2	Ehen2015_D	1000	71.82	0.55
NB5a.2	Ehen2015_U	1000	71.82	0.55

Fluvial Flood Map: Whitehaven Road, Cleator Moor, CA25 5PY

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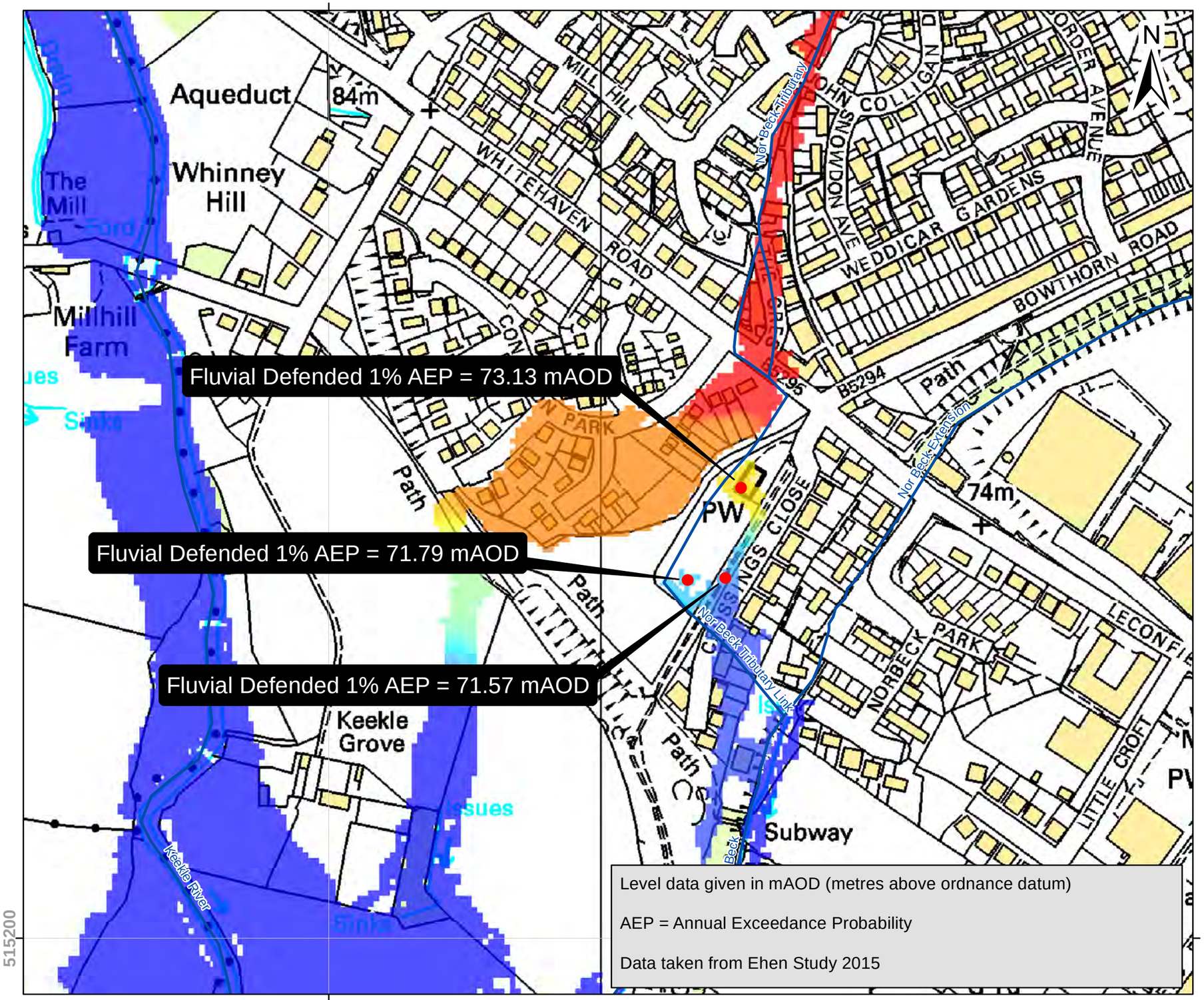


Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

Data taken from Ehen Study 2015

Key

Main River

Fluvial Defended 1% annual probability of flooding scenario

mAOD

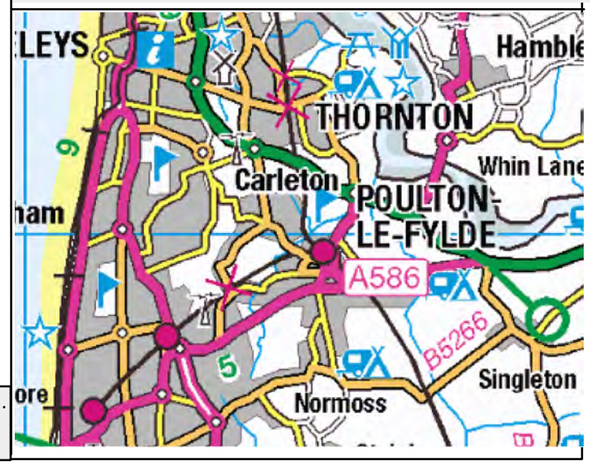
High : 74

Low : 71

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 0.5% or greater chance of happening each year
- or from a river with a 1.0% or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to 0.1% chance of occurring each year.

ABDs (Areas Benefiting from Defences) show the area benefiting from defences during a 0.5% tidal, or 1.0% fluvial flood event.



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Fluvial Flood Map: Whitehaven Road, Cleator Moor, CA25 5PY

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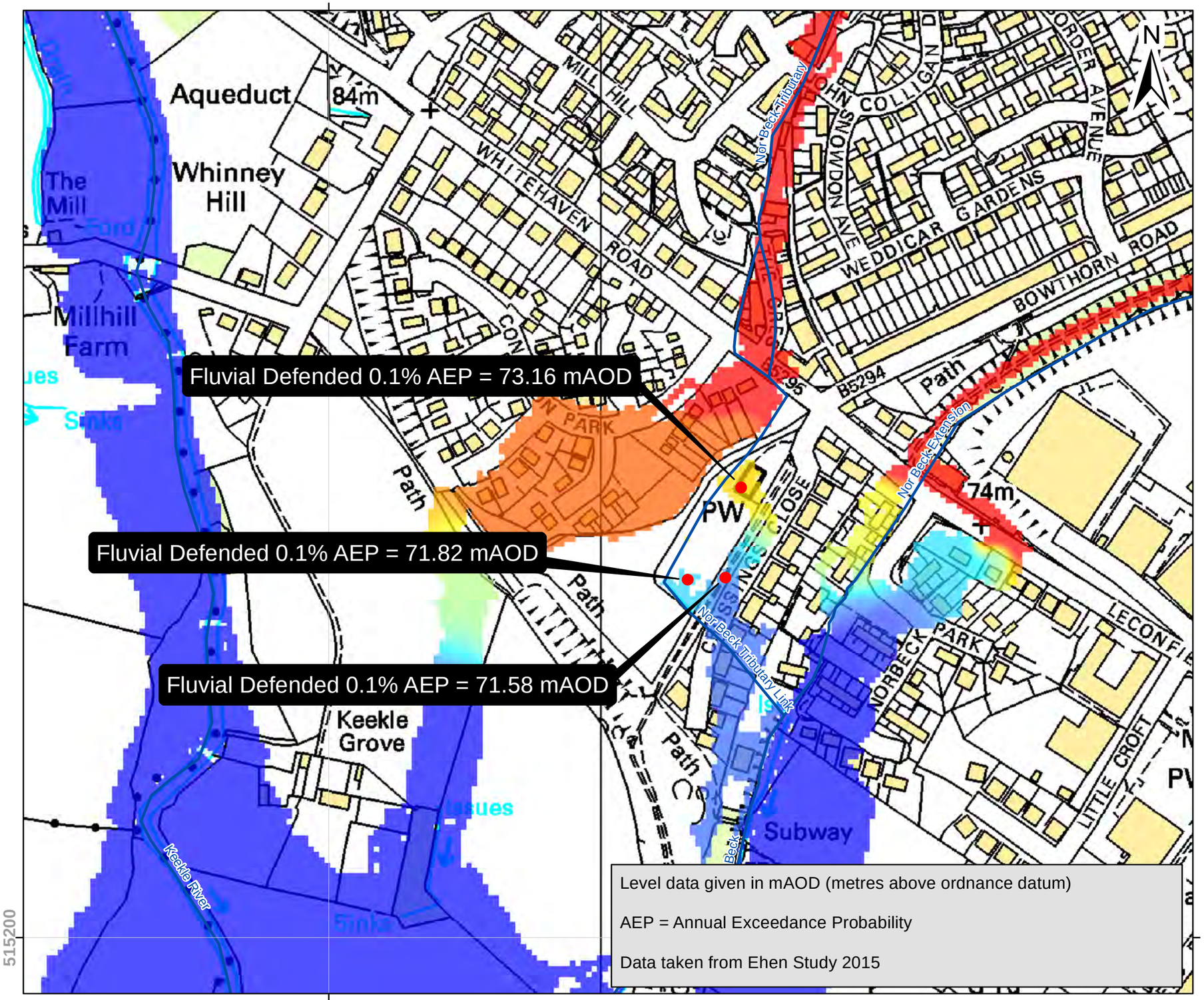


Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

Data taken from Ehen Study 2015

Key

Main River

Fluvial Defended 0.1% annual probability of flooding scenario

mAOD

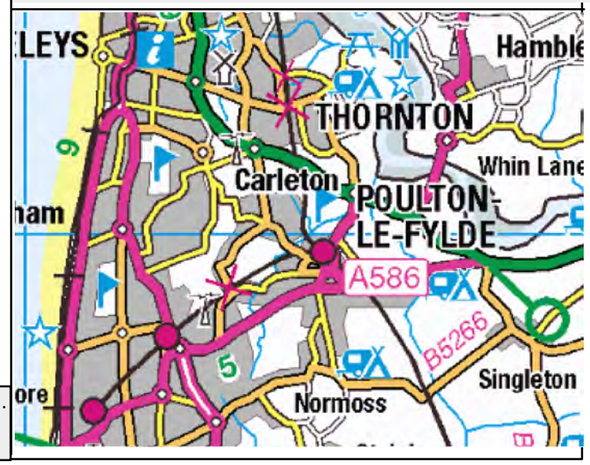
High : 74

Low : 71

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 0.5% or greater chance of happening each year
- or from a river with a 1.0% or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to 0.1% chance of occurring each year.

ABDs (Areas Benefiting from Defences) show the area benefiting from defences during a 0.5% tidal, or 1.0% fluvial flood event.



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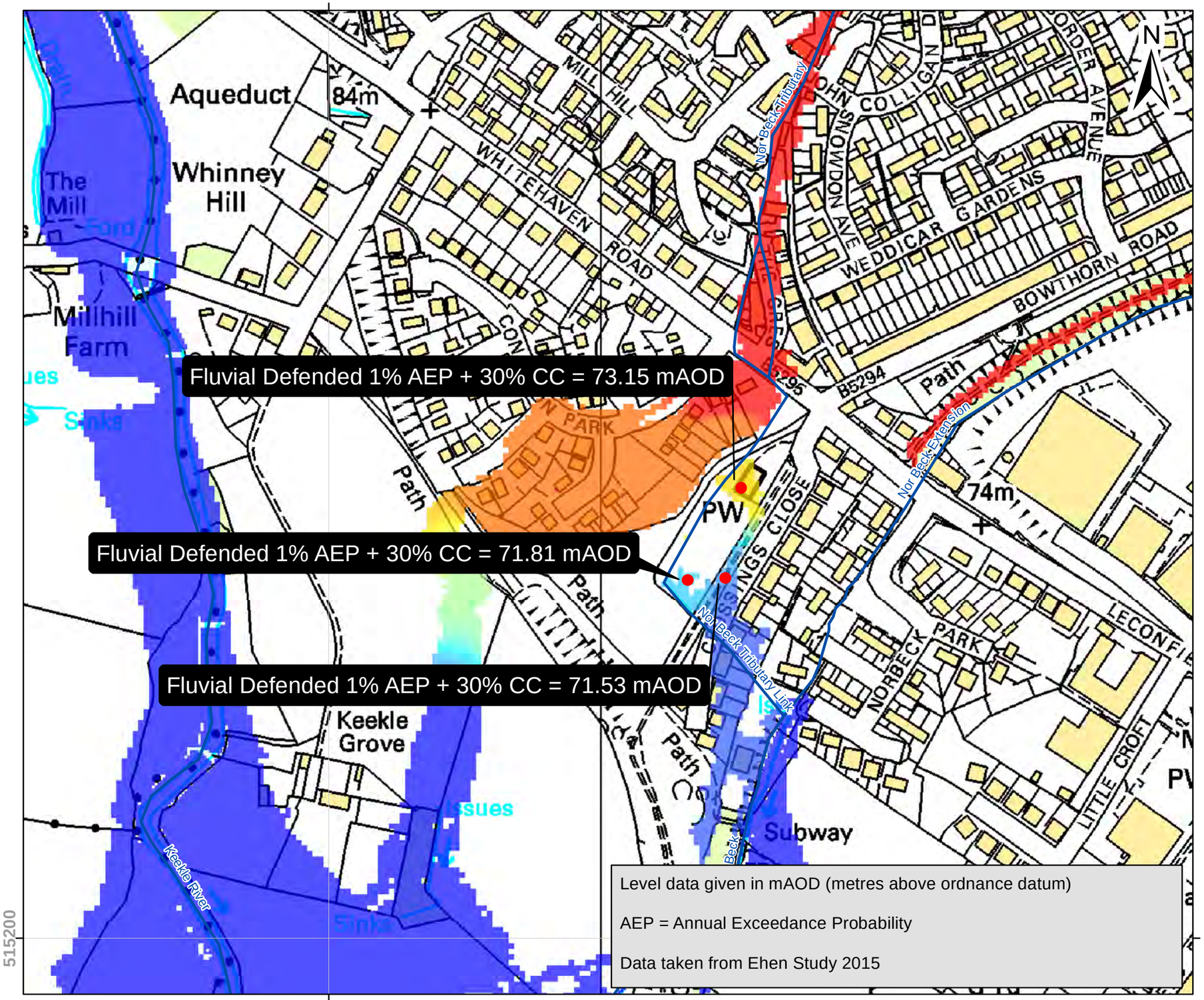
Fluvial Flood Map: Whitehaven Road, Cleator Moor, CA25 5PY

Produced: 14 September 2021
Our Ref: CL232400
NGR: NY0111215532



Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

Data taken from Ehen Study 2015

Key

Main River

Fluvial Defended 1% annual probability of flooding scenario + 30% Climate change

mAOD

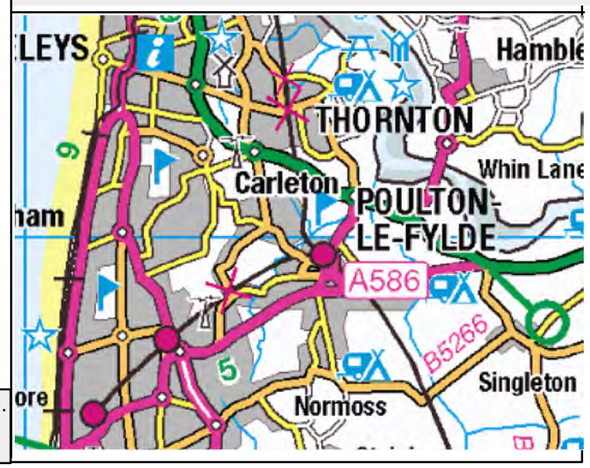
High : 74

Low : 71

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 0.5% or greater chance of happening each year
- or from a river with a 1.0% or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to 0.1% chance of occurring each year.

ABDs (Areas Benefiting from Defences) show the area benefiting from defences during a 0.5% tidal, or 1.0% fluvial flood event.



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

Fluvial Flood Map: Whitehaven Road, Cleator Moor, CA25 5PY

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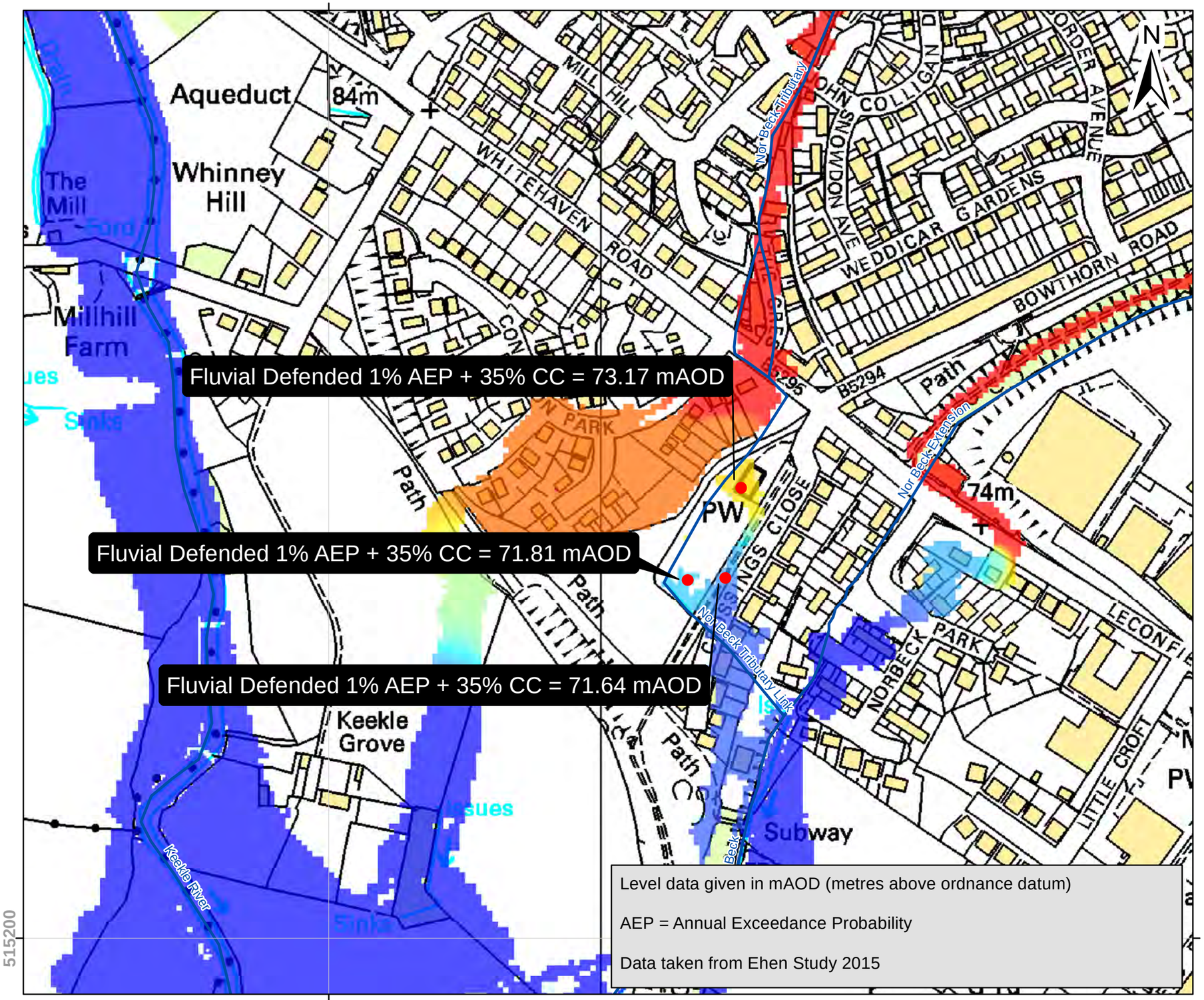

Level data given in mAOD (metres above ordnance datum)

AEP = Annual Exceedance Probability

Data taken from Ehen Study 2015

Key

Main River

Fluvial Defended 1% annual probability of flooding scenario + 35% Climate change

mAOD

High : 74

Low : 71

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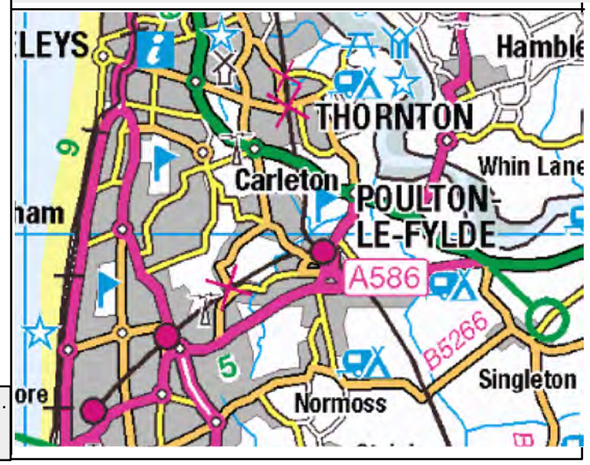

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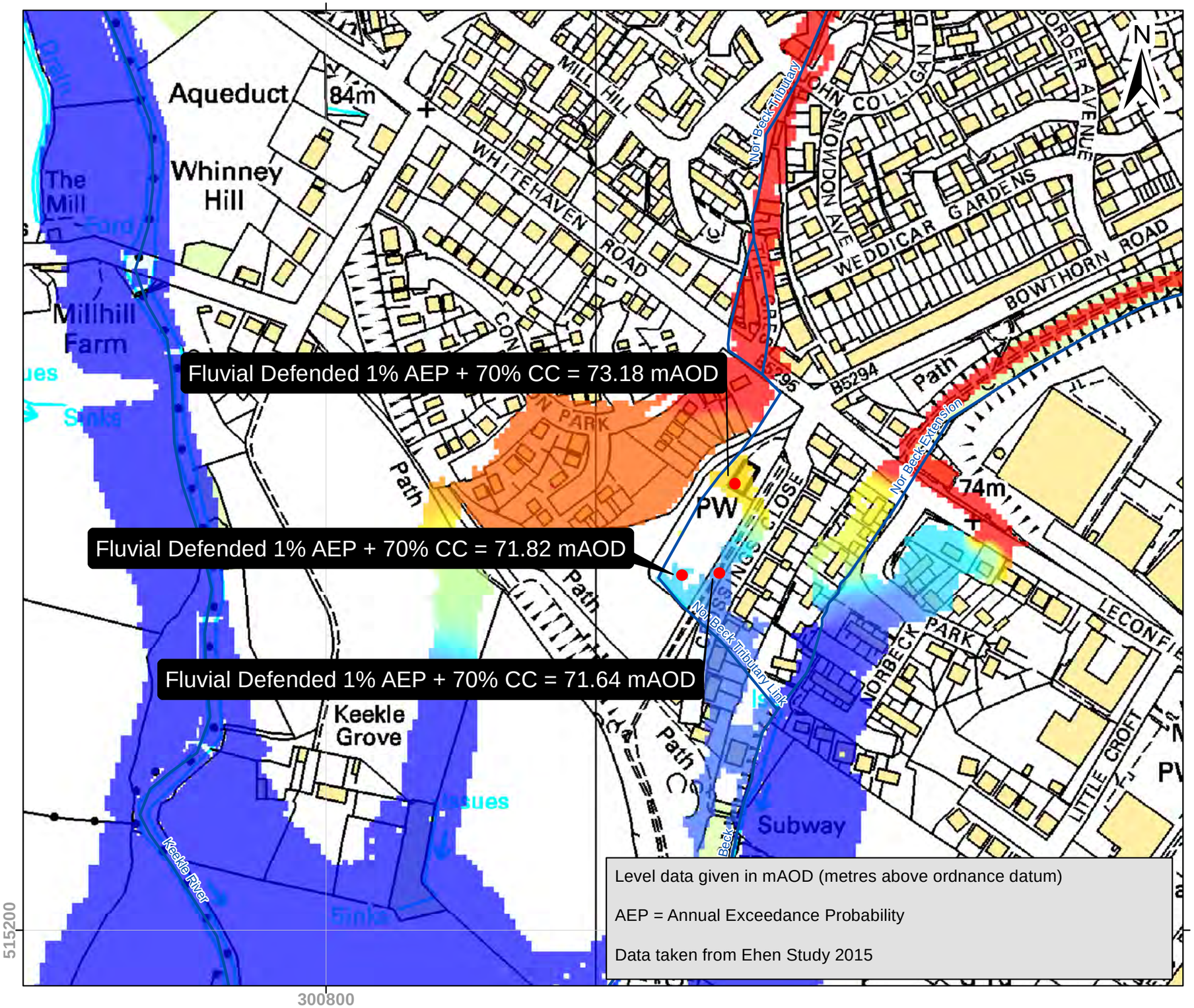

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Environment Agency

Fluvial Flood Map: Whitehaven Road, Cleator Moor, CA25 5PY

Produced: 14 September 2021
Our Ref: CL232400
NGR: NY0111215532

Key

Main River

Fluvial Defended 1% annual probability of flooding scenario + 70% Climate change

mAOD

High : 74

Low : 71

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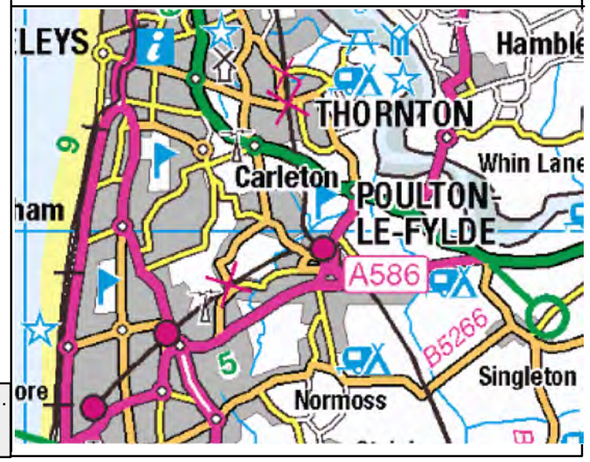

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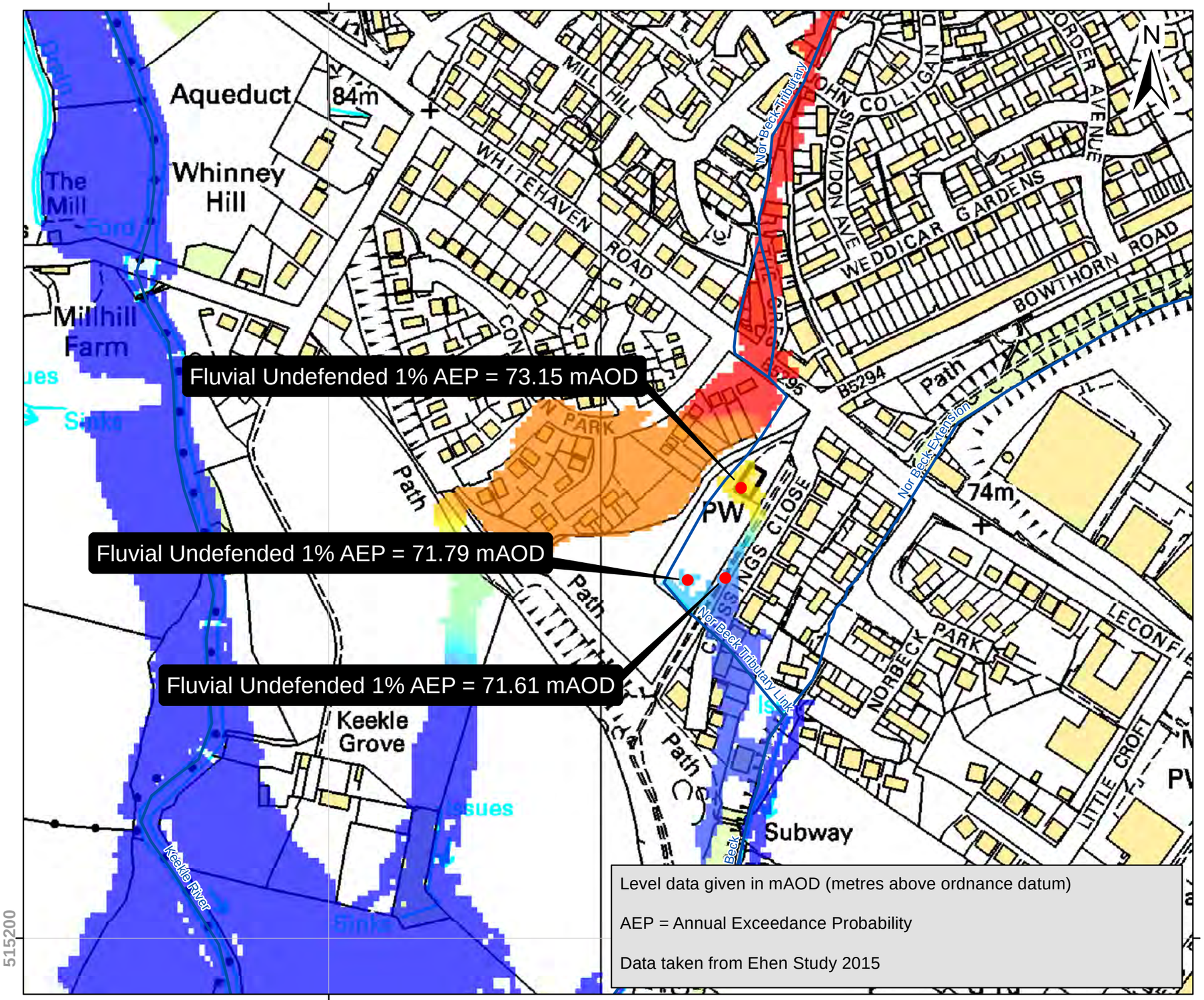

Level data given in mAOD (metres above ordnance datum)

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Key

Main River

Fluvial Undefended 1% annual probability of flooding scenario

mAOD

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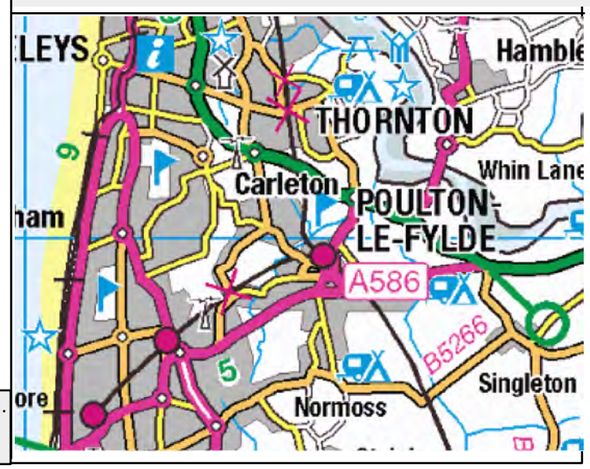

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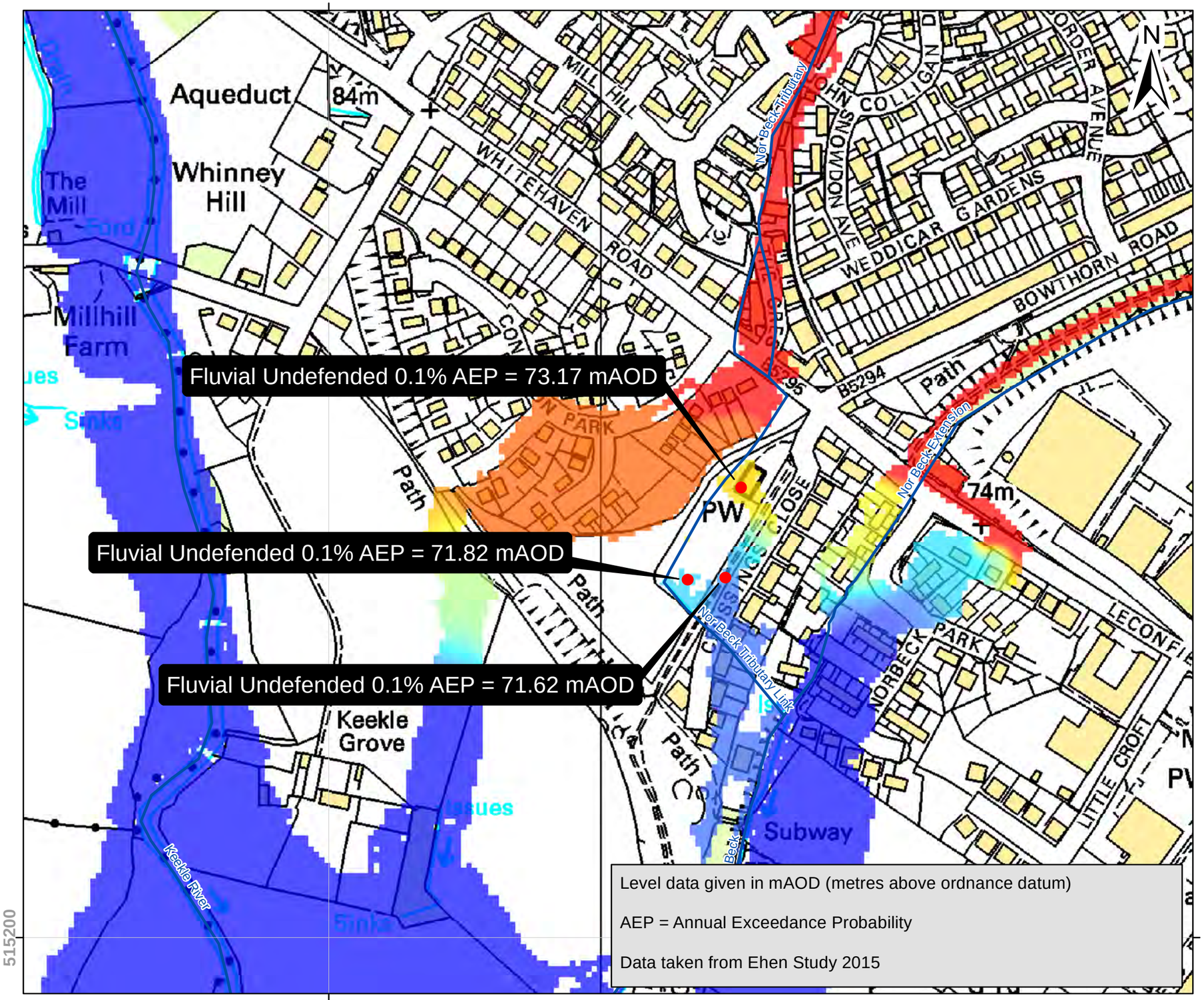

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AEP = Annual Exceedance Probability

Data taken from Ehen Study 2015

Key

Main River

Fluvial Undefended 0.1% annual probability of flooding scenario

mAOD

High : 74

Low : 71

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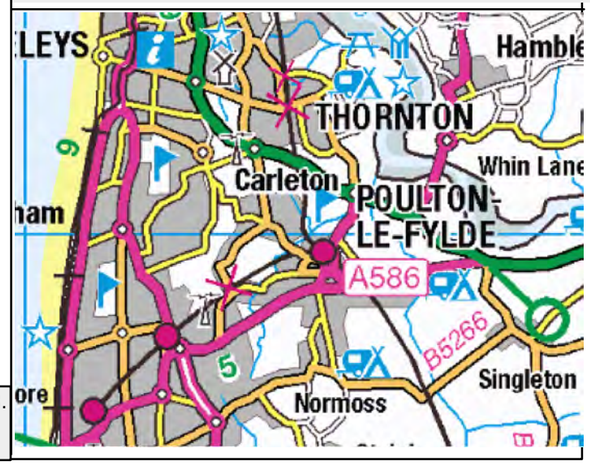

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Fluvial Flood Map: Whitehaven Road, Cleator Moor, CA25 5PY

Produced: 15 September 2021
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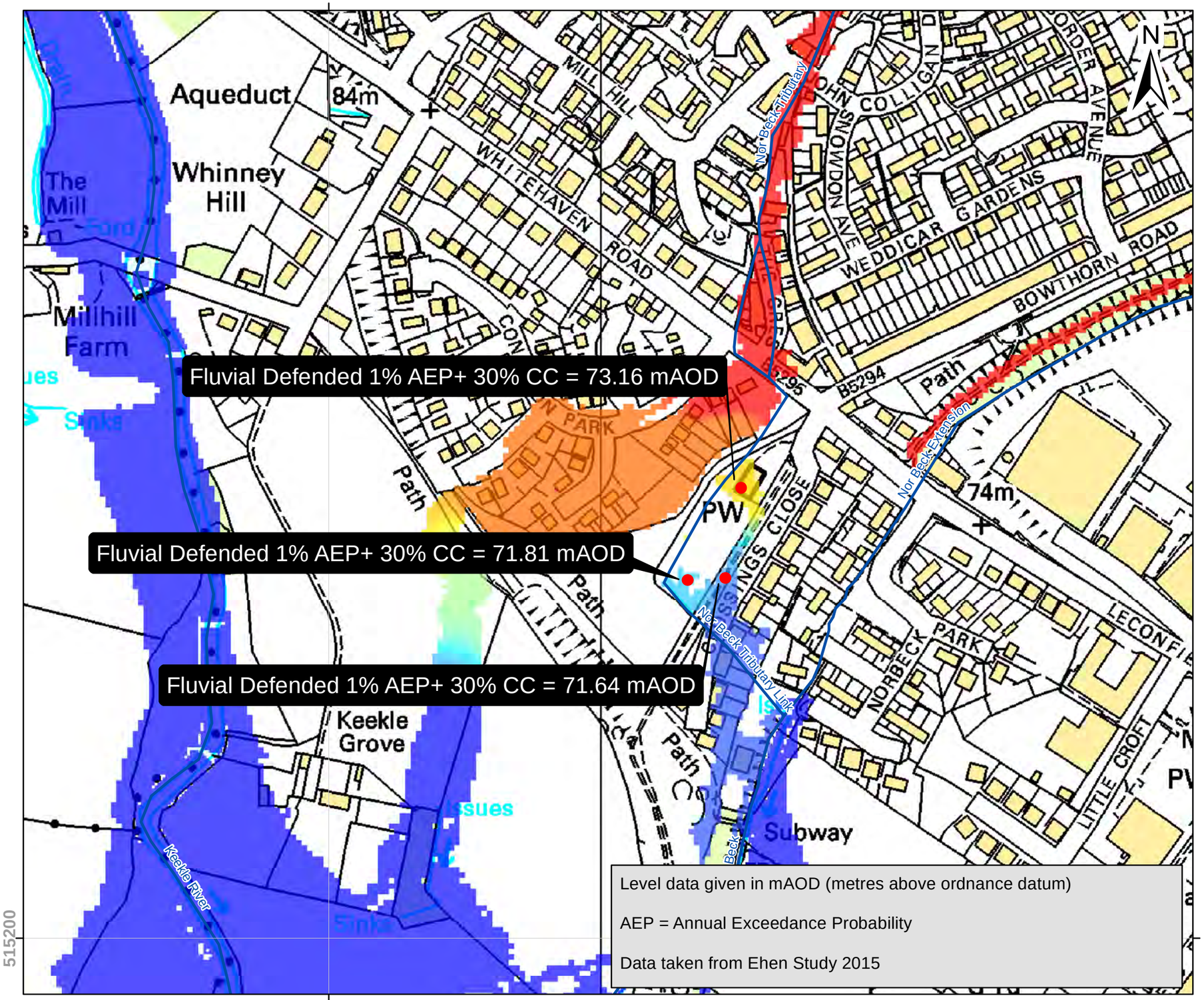

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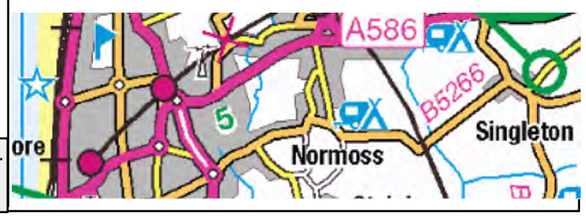

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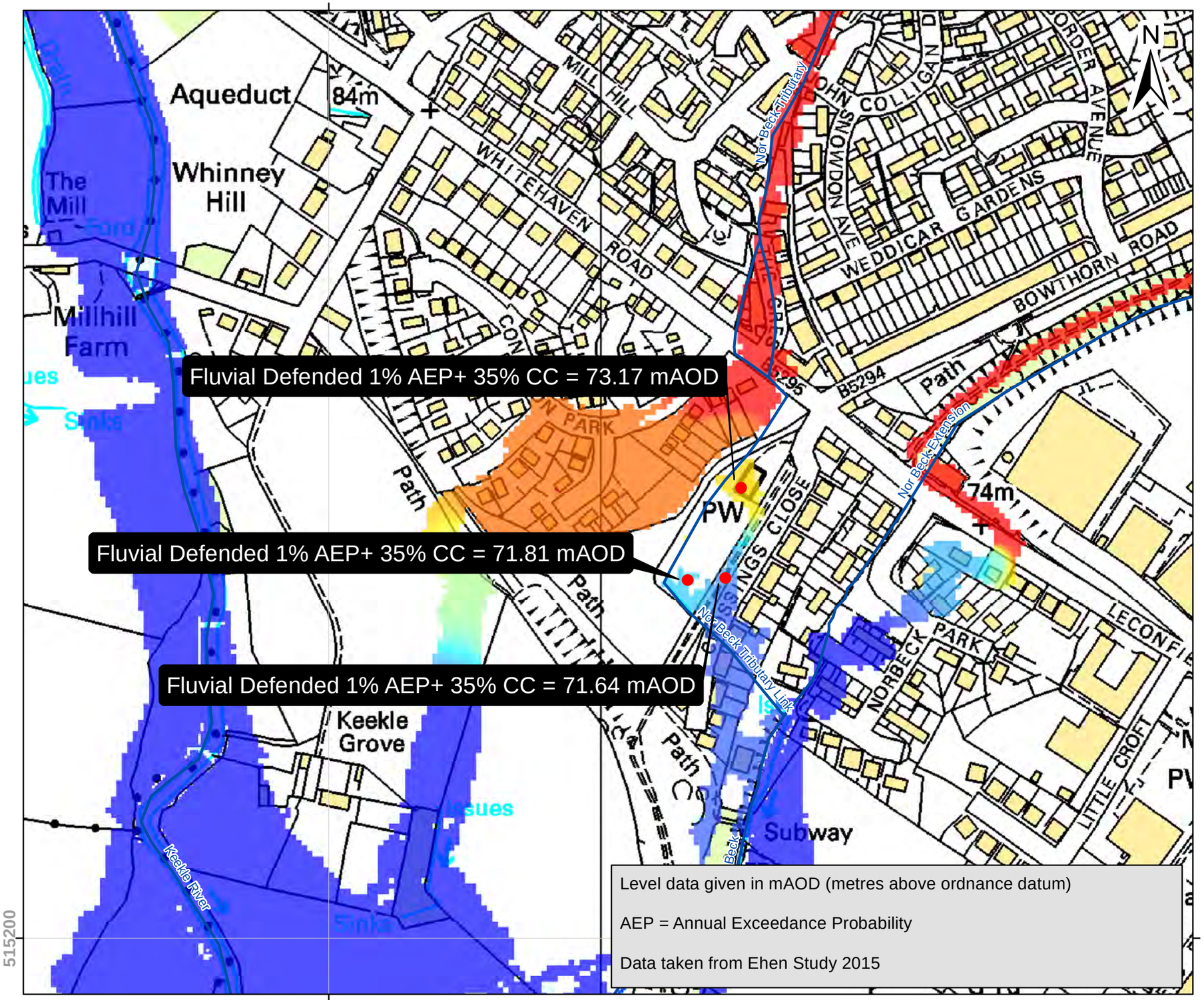

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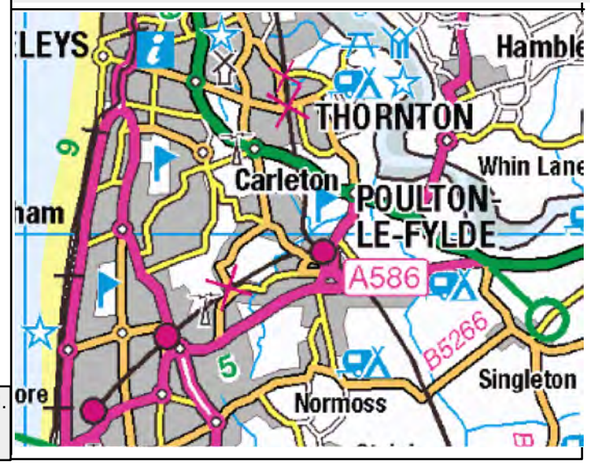

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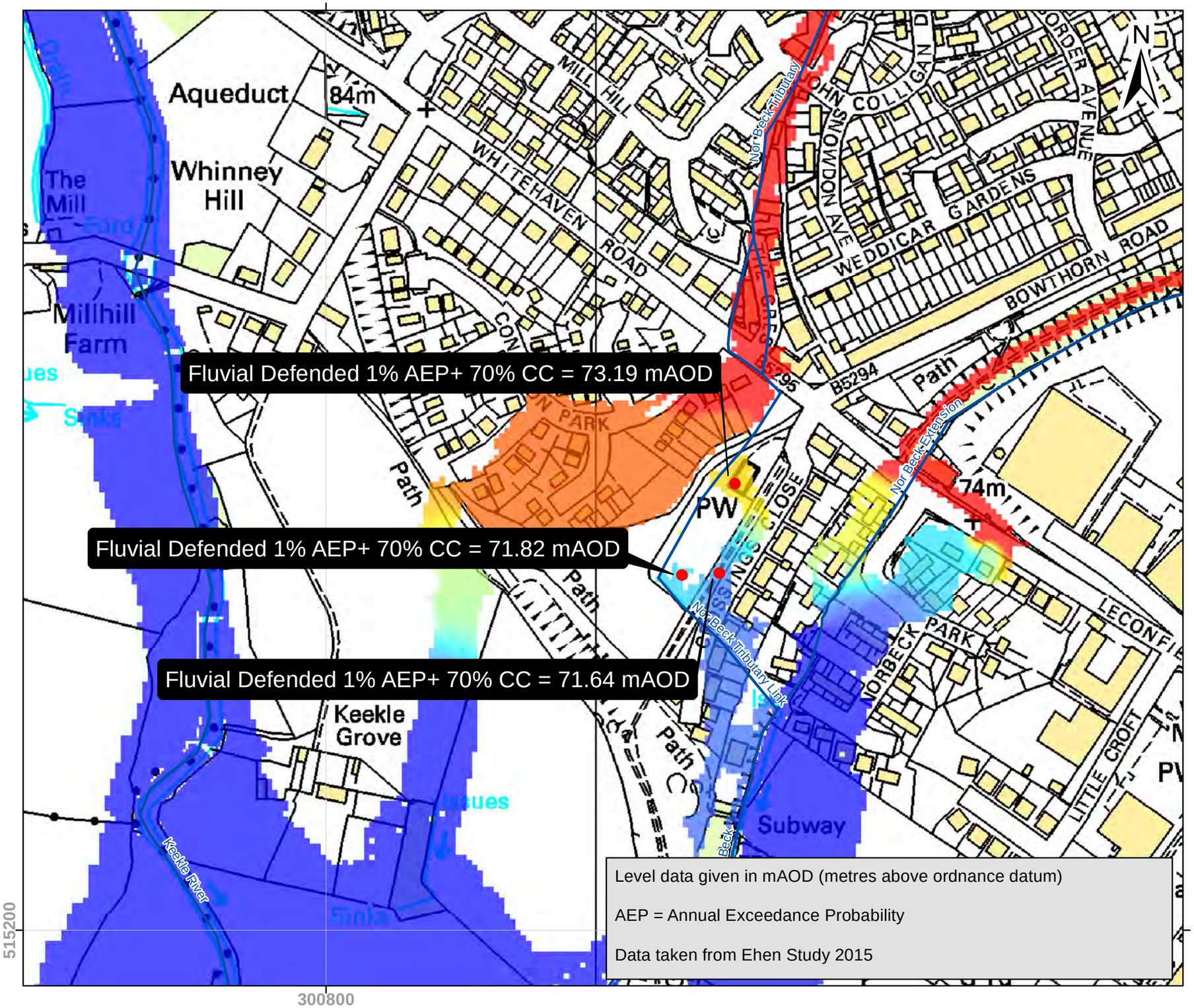

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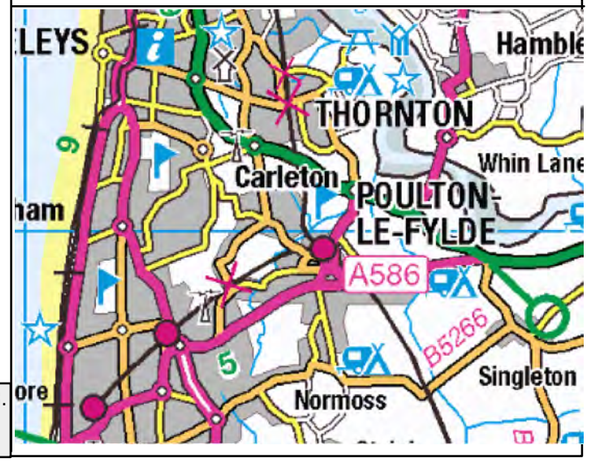

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BETTS HYDRO
CONSULTING ENGINEERS

APPENDIX D – CUMBRIA COUNTY COUNCIL & COPELAND BOROUGH COUNCIL CORRESPONDENCE

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Hannah Buchanan

From: David Bechelli
Sent: 13 September 2021 15:03
To: Hannah Buchanan
Subject: RE: Historic Flood Risk Information - Whitehaven Road, Cleator Moor, CA25 5PY

Hi Hannah,

Thanks.

You may have sent the location plan previously, but sometimes, the way e-mails are sent on, the attachments are lost.

I'm sure I've seen previous FRA's for proposed development of the site and as for the site itself, I don't hold any data, as the watercourse, open and culverted is main river and is referred to as Nor Beck Tributary or Nor Beck Drain.

I'm sure that the EA will have some information and likely some historic flood outlines.

However, I understand that there has been flooding associated with this watercourse and I can provide some rough background info:

- Due to a blockage caused by a matrass at the upstream end of the culvert (301171 515879), severe flooding occurred affecting a number of properties on the Coniston Park estate, immediately north west of the site. I think this may have been in 1999, before the watercourse was enmained.
- I think there may have been some more localised flooding affecting Crossing Close, immediately south east of the site, due to blockages of the trash screen on site (301067 515437).
- I think it was following surveys, the EA determined that culvert was not up to standard and undertook works to bring it up to standard, possibly 2011.
- I think further modelling have raised concerns that Nor Beck and Tributary culverts may be undersized and/or susceptible to blockages.

With previous FRA's for proposed development of the site, I think there may have been queries about the extent of Flood Zone, which could be based on historic flooding, rather than flood modelling, as from memory there is an old railway embankment forming the boundary of the site.

Regards

Dave

David Bechelli
Flood and Coastal Defence Engineer
Environmental Health
Copeland Borough Council

Copeland Borough Council, Whitehaven Commercial Park, Moresby Parks, Whitehaven, Cumbria, CA28 8YD. Tel: 01946 598300. Fax: 01946 598303. www.copeland.gov.uk, info@copeland.gov.uk

From: Hannah Buchana
Sent: 13 September 2021 14:07
To: David Bechel
Subject: RE: Historic Flood Risk Information - Whitehaven Road, Cleator Moor, CA25 5PY

Hi David,

Thank you for contacting me, sorry that it didn't work previously!

I've attached the location plan here for you.

Kind Regards,

Hannah Buchanan *BSc (Hons)*
Graduate Flood Risk Analyst

BETTS HYDRO
Consulting Engineers
Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

CIVIL | STRUCTURAL | GEO-ENVIRONMENTAL | HYDROLOGY | FLOOD RISK MANAGEMENT
SUDS | STRUCTURAL SURVEYS | PARTY WALL DUTIES | INFILTRATION | GEOTECHNICAL

From: David Bechelli
Sent: 13 September 2021 14:01
To: Hannah Buchana
Subject: Historic Flood Risk Information - Whitehaven Road, Cleator Moor, CA25 5PY

Hi Hannah,

Your request for the above was forwarded to me, but unfortunately the location plan wasn't attached.

Could you send me the location plan directly.

Regards

Dave

David Bechelli
Flood and Coastal Defence Engineer
Environmental Health
Copeland Borough Council

Copeland Borough Council, Whitehaven Commercial Park, Moresby Parks, Whitehaven, Cumbria, CA28 8YD. Tel: 01946 598300. Fax: 01946 598303. www.copeland.gov.uk, info@copeland.gov.uk

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Hannah Buchanan

From: Hannah Buchanan
Sent: 06 September 2021 16:08
To:
Subject: Historic Flood Risk Information
Attachments: Location Plan.pdf

To whom it may concern,

Whitehaven Road, Cleator Moor, CA25 5PY

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the above site (location plan attached), including details of historical flooding and any predicted flood water levels; this would be greatly appreciated. If there are any specific requirements that you require in a scope of works for this site, please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards,

Hannah Buchanan *BSc (Hons)*
Graduate Flood Risk Analyst

BETTS HYDRO
Consulting Engineers
Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

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CONSULTING ENGINEERS

APPENDIX E – UU CORRESPONDENCE

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Hannah Buchanan

From: Duckworth, Mike
Sent: 08 September 2021 17:08
To: Hannah Buchanan
Cc: Wastewater Developer Services
Subject: Pre Development Enquiry for : Whitehaven Road, Cleator Moor, CA25 5PY UU reference Number : 4200043306

Good morning Hannah,

Pre Development Enquiry for: Whitehaven Road, Cleator Moor, CA25 5PY UU Reference Number : 4200043306

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:

https://www.unitedutilities.com/builders-developers/working-near-our-assets/

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Our preferred point of discharge would be to the 675mm diameter public combined sewer adjacent to Crossings Close located to the East of your proposed development at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

https://www.gov.uk/government/publications/groundwater-protection-position-statements

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 600mm diameter public surface water sewer West of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5l/s.

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the pubic sewerage network under any circumstances

Sewer Adoptions

You have indicated on your application form that you intend to put the sewers forward for adoption (including any SuDS components that can come within the meaning of a sewer).

United Utilities assess adoption applications based on the current Design & Construction Guidance and local practices which have now replaced 'Sewers For Adoption 6th Edition'.

We recommend that you submit a pre design assessment to the sewer adoption mailbox (SewerAdoptions@uuplc.co.uk) stating pre design assessment in the title

Please refer to links below to obtain further guidance:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-adoptions/

Site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines, we would recommend that you speak and make suitable agreements with the relevant statutory bodies.

If you intend to put forward your wastewater assets for adoption by United Utilities, the proposed detail design will be subject to a technical appraisal by an Adoption Engineer as we need to be sure that the proposals meets the requirements set out in the Design & Construction Guidance. The proposed design should give consideration to long term operability and give United Utilities a safe and cost effective proposal for the lifetime of the assets. In these cases, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 application, has been assessed and accepted in writing by United Utilities. Any work carried out

prior to the technical assessment being approved is done entirely at the developer's own risk and could be subject to change.

Codes For Adoption

The new Codes for Adoption are outlined on the Water UK Website. The link below takes you to their webpage:

https://www.water.org.uk/technical-guidance/developers-services/codes-for-adoption/

A free copy of the new Design & Construction Guidance can be downloaded via the link below**:**

https://www.water.org.uk/wp-content/uploads/2020/03/SSG-App-C-Des-Con-Guide-v-2-100320-C.pdf

Existing Wastewater Assets Crossing the Site

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewers for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipes unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting the public sewers.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: **DeveloperServicesWater@uuplc.co.uk**. Further information for this service can be found on our website via the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

Kind regards

United Utilities
Water for the North West

Mike Duckworth
Developer Services Engineer
Developer Services & Metering
Customer Services
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APPENDIX F – HYDRAULIC MODELLING FEE PROPOSAL

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APPENDIX F – FLOOD RISK ASSESSMENT AND DRAINAGE MANAGEMENT STRATEGY FEE PROPOSAL

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HYD662/WhitehavenRoad/MB/SF/01/FP01

14th October 2021

South North Group Architecture Ltd
Greengate Business Centre
2 Greengate Street
Oldham
OL4 1FN

Dear Spencer,

LAND OFF WHITEHAVEN ROAD, CLEATOR MOOR
FLOOD RISK ASSESSMENT AND DRAINAGE MANAGEMENT STRATEGY

I have the pleasure of providing our fee proposal for undertaking the Flood Risk & Drainage Management Strategy, to support the proposed planning application for the site above. I have undertaken some brief research and believe that a staged approach would be most appropriate in this case given the flood risk classifications, I have allowed for the necessary updates within our quotation.

- Flood Risk Assessment & Drainage Management Strategy – £2,000 plus VAT

Outline Assessment
Review of the Environment Agency Flood Map for Planning indicates that the site is located within Flood Zone 1, 2 and 3, as defined by the Environment Agency). Flood Zone 1 is an area at low risk of flooding from fluvial/tidal sources and Flood Zone 2 is an area at risk of flooding from fluvial/tidal sources in the undefended 1 in 1000yr return period event. Flood Zone 3 is an area at fluvial risk during the 1 in 100yr return period (1% Annual Exceedance Probability) event or the tidal 1 in 200yr (0.5% AEP) event.

The mapping has also identified an Environment Agency designated Main River (Nor Beck) crossing the development site from the northern to the southern boundary of site. The long-term government flood risk mapping also shows the site to be at medium to high risk of fluvial flooding. The Environment Agency Flood Zone Maps and long-term government flood risk mapping are based on the outputs derived from the national flood modelling datasets, which typically include the Main River networks and any Ordinary Watercourses with contributing catchments greater than 2km^2. It is assumed that the Main River onsite has been included within the national mapping and the flood risks are reflected.

In terms of other sources of flood risk, the long-term flood risk mapping suggests that the site is at low risk from flooding associated with a potential breach or failure in any nearby reservoirs. The potential flood risks from surface water at the site have also been identified as low, this means each year this road has a chance of flooding of greater than 3.3% and may potentially impact site. All potential flood risk sources will need to be considered further as part of the full assessment in due course.

Proposed Approach
Our initial approach will be to consult with the Environment Agency, Cumbria County Council, Copeland Borough Council and United Utilities to see whether they can provide any information regarding historical flooding or predicted top water flood levels data near to the development site. Any Third-Party charges are not included.

The emphasis of the Flood Risk Assessment will be on the potential flood risk from fluvial and surface water flood risks, although the assessment will review all forms of flood risk. The FRA will advise on the appropriate mitigation measures and aim to achieve the EA/LLFA/LPA development requirements. This fee proposal assumes that the available flood modelling

information is correct and can be applied to the site as part of the FRA. Further discussion will be required with the EA to ascertain whether additional hydraulic analysis is required to support a full planning application at the site.

The focus of the Drainage Management Strategy will be on the effective management of surface water run-off generated by the proposed buildings and hardstanding areas only. This is to ensure no increased flood risk will result from the proposals and show conformance with national and local planning policy. It may also be beneficial to consider the drainage in more detail depending on the nature of planning application being submitted. This fee allows for a written drainage strategy only and should the LPA/LLFA require more detail on the deliverability of the proposed scheme a separate fee will need to be provided.

Scope of Works

The Flood Risk Assessment & Drainage Management Strategy will include:

- Review of available data, including any Hydraulic Modeling outputs/reports
- Purchase Sewer Records *Third-Party charges are not included
- Review of the Preliminary/Strategic Flood Risk Assessment
- Assessment of the existing site flood risk mechanisms both to and from the site
- Identification of development constraints because of flood risk and possible mitigation measures
- Pre-development assessment of the drainage characteristics of the site
- Post-development assessment of drainage options, impacts and recommendations for mitigation
- Stormwater storage estimates using Microdrainage (Quick Storage Estimates)
- Assessment of suitability for the application of Sustainable Drainage Solutions (SuDS)
- Assessment of suitability for infiltration drainage solutions
- Assessment of surface water connection to watercourse
- Assessment of suitability for SW/FW connections to the public sewer network
- Pre-development enquiry with Water Company if a connection to public sewer is required (foul and/or surface water) *Water Company charges are not included
- A comprehensive assessment of SuDS opportunities (where appropriate)
- Production of a Flood Risk Assessment & Drainage Management Strategy report to accompany a planning application

Required Information

We will require the following information to be provided to support the preparation of our assessment.

- Full topographic survey to Ordinance Survey (OS Datum), and planning layout in both pdf and AutoCAD compatible format (georeferenced and scaled correctly)
- Existing drainage layout for the wider site (including land drainage) providing details on routing, condition, size, and capacity of any existing systems
- Soakaway Testing is recommended to be carried out to support the written drainage management strategy

Exclusions

This fee proposal does not include any third-party consultee costs for data, advice or pre-application reviews, or intrusive site investigations. It is noted that this initial assessment

does not include for any hydraulic modelling and will review the information available at this time. Should the Environment Agency or Lead Local Flood Authority request that this work be undertaken during our consultations, then we can provide an additional fee.

There will be a requirement for the client to obtain, if not already, some onsite ground levels information (to OS Datum) for comparison to be carried out when the flood mapping data is obtained as part of the full assessment.

The fee proposal also does not include for any meetings, consultations or walkovers, above that which is identified in the scope of works. These are chargeable based on the site specifics and cannot be determined until more detail is provided. Any additional fee for attendance will be identified in writing and agreed with the client prior to the event.

Delivery
The outputs will be provided in PDF format electronically; should hard copies be required these can be provided at cost. Timescales for delivery will need to be reviewed at the time of instruction; however, the initial scoping exercise will typically take 4-6 weeks depending upon the consultee response times. The EA typically have a 20 working days response time; however, this may be extended due to the current Covid19 crisis.

Please note that the findings and conclusions are not always supportive of the development proposals, and we will advise if this is likely to be the case as the project progresses to allow opportunity for the proposals to be adapted to reflect the findings of the assessment.

In the absence of any formal appointment documentation our services are offered in accordance with the attached terms & conditions and ACE Agreement 1: Design 2009 Editions, 2nd Revision & Agreement 2: Advisory, Investigatory and other services 2009 Edition, 2nd Revision.

This letter should be read in conjunction with our Project Management Plan and our terms and conditions. Instruction should be made using the appropriate part of the Project Management Plan form.

I trust you will find the above of assistance, however, if you have any queries or require further information, please do not hesitate to contact me.

Yours sincerely,

Megan Berry *BSc(Hons) MCIWEM*
Flood Risk Analyst
BETTS HYDRO

Enc. Terms of Business

BETTS HYDRO
CONSULTING ENGINEERS

BETTS HYDRO LTD
TERMS OF BUSINESS

1. SERVICES

1.1 The scope of the Services to be provided to the Client by the Consultant will be agreed in writing between them.

1.2 If the Client requires any additional services or any change to the agreed Services, the Consultant will be entitled to an adjustment of the fees and an estimate of the additional fees which may be due will be provided to the Client upon request.

2. COMMENCEMENT / DURATION OF SERVICES

2.1 If the commencement date for the Services is not agreed in advance, the Services will be treated as having commenced on the date the Consultant begins to carry out any of the Services.

2.2 The Services will continue until they are completed, unless the Appointment is terminated early in accordance with these Terms of Business.

3. FEES AND EXPENSES

3.1 The fees payable for the Services will be as agreed in writing between the Client and the Consultant. Should the client not formally respond to the consultants fee proposal but services commence (see item 2) such fees are deemed to be accepted.

3.2 Out of pocket expenses (including travel, telecommunications and other costs) will be recoverable in addition to fees and the appropriate amounts will be added to the Consultant's invoices, unless stated otherwise.

3.3 The daily and hourly rates quoted to the Client are subject to review annually on [*1st January*].

3.4 The client may not withhold any payment after the final date for payment of any sum due under this Agreement unless the Client gives not later than 7 days before such final date a notice specifying the amount proposed to be withheld and the ground for withholding payment or if there is more than one ground each ground and the amount attributable to it. Our standard payment terms are 07/14/21 days. New clients will be subject to Proforma / Payment On Delivery.

3.5 The Consultant will be entitled to interest on overdue accounts at the rate of [*4%*] above the Base Rate of [*Royal Bank of Scotland*], calculated on a daily basis from the due date until payment is received by the Consultant.

3.6 The daily and hourly rates of the Consultant's personnel quoted to the Client will, unless otherwise agreed, apply to any additional services.

3.7 Fees are quoted exclusive of VAT. If applicable, this will be added to each invoice and payable by the Client.

4. INFORMATION & APPROVAL

4.1 The Client will ensure that the Consultant is provided in good time with all information needed to enable the Consultant to perform the Services and the Consultant will be entitled to rely on that information.

4.2 The Client will give all decisions and approvals in a timely manner and provide any additional assistance which the Consultant may reasonably request.

5. STANDARD OF CARE

5.1 The Consultant will exercise reasonable skill, care and diligence in the performance of the Services in accordance with the standards of the Consultant's profession.

5.2 The Consultant will also use reasonable endeavours to adhere to the programmes (if any) agreed with the Client for the provision of the Services, but will not be responsible for any delay which is due to reasons attributable to the Client or otherwise beyond the Consultant's control.

6. INTELLECTUAL PROPERTY

6.1 Copyright in all drawings, reports, documents and computer-generated data prepared by the Consultant will remain the property of the Consultant. Subject to the Client paying all fees and expenses which are due, the Client will have a licence to copy and use those documents and data for any purpose related to the project for which the Services are provided, but not for any other purpose.

6.2 In the event of the Client being in default of payment of any fees or other amounts due under this Agreement, the Consultant may revoke the licence herein granted on giving seven days' notice. The Consultant shall not be liable for the use by any person of any such drawings or other documents for any purpose.

7. PERSONNEL

7.1 The Consultant will designate an individual to act as the principal representative of the Consultant in dealings with the Client concerning the Services. The Consultant reserves the right to change that individual but will not do so without good reason and will inform the Client of any such change.

7.2 The Consultant will provide the Client with details of the professional qualifications and experience of staff engaged on the Services upon request.

8. LIABILITY & INSURANCE

8.1 The Consultant will take appropriate steps to remedy any defect in the Services for which the Consultant is responsible and which is immediately notified by the Client at any time up to [*6 months*] following completion of the Services unless otherwise noted agreed at a max [12months].

8.2 The Consultant maintains professional indemnity insurance and will use its reasonable endeavours to maintain such insurance for so long as it has any liability under the Appointment. The Consultant will have no liability to the Client whether in contract or in tort except to the extent that such liability is covered by its professional indemnity insurance and the Consultant shall, in any event, have no liability to the Client for any indirect or consequential loss suffered by the Client including, but not limited to, loss of profits. Unless noted otherwise the limit of Professional Indemnity insurance will be £1,000,000.

9. TERMINATION

9.1 The Consultant may terminate the Appointment at any time by giving notice to the Client if the Client commits a material breach of any of the terms agreed between them which is not remedied within 14 days. Failure to pay fees and expenses on the due date will constitute a material breach.

9.2 The Client may terminate the Appointment by notice to the Consultant if the Consultant commits a material breach of any of the terms agreed between them and fails to take steps to remedy the breach within 14 days of notice requiring it to do so from the Client.

9.3 Upon termination the Client will pay the Consultant all fees and expenses due up to the termination date. In the event of wrongful termination by the Client, the Client will in addition pay the Consultant an appropriate amount of compensation for the Consultant's loss of anticipated profit.

9.4 Termination will not prejudice the accrued rights and liabilities of the parties.

10. ASSIGNMENT & SUBCONTRACTING

Neither party will assign or subcontract its obligations without the consent of the other. In the event of the Consultant wishing to subcontract any of the Services, the Client will not unreasonably withhold its consent. The Consultant will not be relieved of any of its liabilities to the Client in the event of any subcontracting.

11. LAW & JURISDICTION

11.1 The agreement between the parties is governed by [English] law.

11.2 Any disputes which cannot be resolved amicably will be resolved by the [*courts of England and Wales*].

11.3 Each party will give serious consideration to a request by the other that any dispute should be referred to mediation.

In the absence of any formal appointment documentation our services are offered in accordance with the above terms & conditions and ACE Agreement 2: Advisory, Investigatory and other services 2009 Edition, 2nd revision.