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Environment Agency
Planning Specialist
Bury Council
Town Hall
Knowsley Street
Bury
Lancashire
BL9 0SW

For the attention of Jennifer Wilson.

Response dated: 27th October 2025

Reference: SO/2025/124668/02-L01

‘Demolition of buildings and erection of 87 no. Affordable dwellings and associated access off Dumers Lane, landscaping and parking. Land adjacent to Bealey Industrial Estate, Dumers Lane, Radcliff, Manchester, M26 2BD’.

Dear Jennifer,

Regarding the site detailed above (your reference: SO/2025/124668/02-L01), thank you for your objection dated the 23.09.2025. Please see your objections in ***bold italics*** and our response in standard text below. Please note: this report does not include any comments on Hutchinson’s Goit and Bealey’s Goit as the existing flood risk assessment excludes this from the report as the ground is higher than the flood levels, as the objection letter from the Environment Agency appear to discuss the flooding from the river Irwell it is assumed the EA is only discussing the River Irwell flooding. Please note: the order of answering your questions is not in line with your objection letter because this letter flows better:

- 1. Climate Change Allowances - It is important to highlight that current flood zone designations do not take account of climate change. Therefore, the FRA must incorporate climate change allowances in line with the latest guidance - Flood risk assessments: climate change allowances - GOV.UK . Where we are unable to provide 1% Annual Exceedance Probability (AEP) climate change model outputs, it is the applicant’s responsibility to undertake and submit appropriate hydraulic modelling for our review.***
The FRA currently bases design flood levels on a 0.5% AEP event, confirming the unavailability of the 1% AEP climate change data. This approach is not acceptable. Planning Practice Guidance (PPG) and the NPPF clearly state that for developments at risk of fluvial flooding, the 1% AEP event plus appropriate climate change uplift

must be assessed. FFL's are proposed to be set 700mm above the 0.5% AEP level. While this may appear conservative, it does not provide assurance that the development would be safe under the 1% AEP climate change scenario. Therefore, an updated FRA must be submitted using appropriate AEP's and climate change.

Townsend Water Engineering (TWE) have undertaken a review of the flows provided by the Environment Agency (EA). As suggested, TWE has taken the climate change allowance from 'Climate Change Allowance for the Peak River Flow'¹. This states that for housing, the climate change should add an additional 35% to the flow of the 1% AEP event. Please see figure 1 for the climate change allowances:

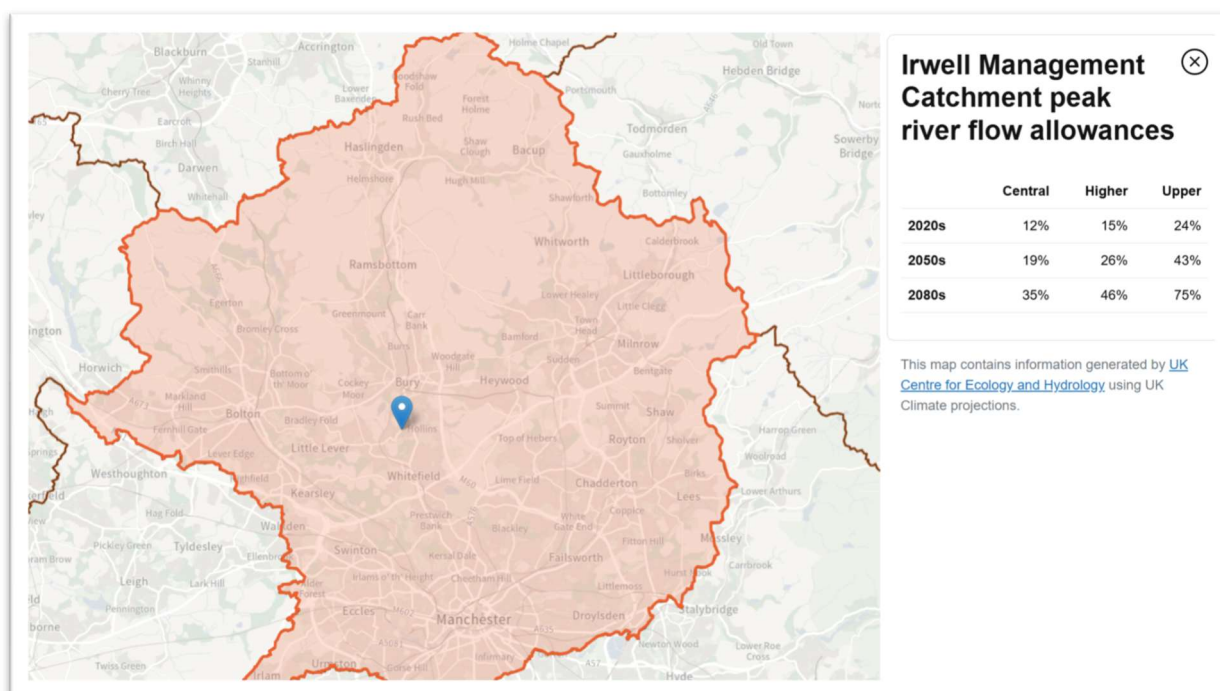


Figure1: Climate Change Allowance for Peak River Flow

To calculate the 1% AEP plus climate change event, TWE have multiplied the 1% AEP flow event by 1.35 (this increases the flow of the 1% AEP flood event to the 1% AEP plus climate change flood event) and then compared the flows with the 0.1 AEP flood flow event. If the flows are comparable, the 0.1% AEP event will be used for the 1% AEP plus climate change event. Please see the node map indicating the position of the flooding nodes.

¹ [Climate change allowances for peak river flow](#)

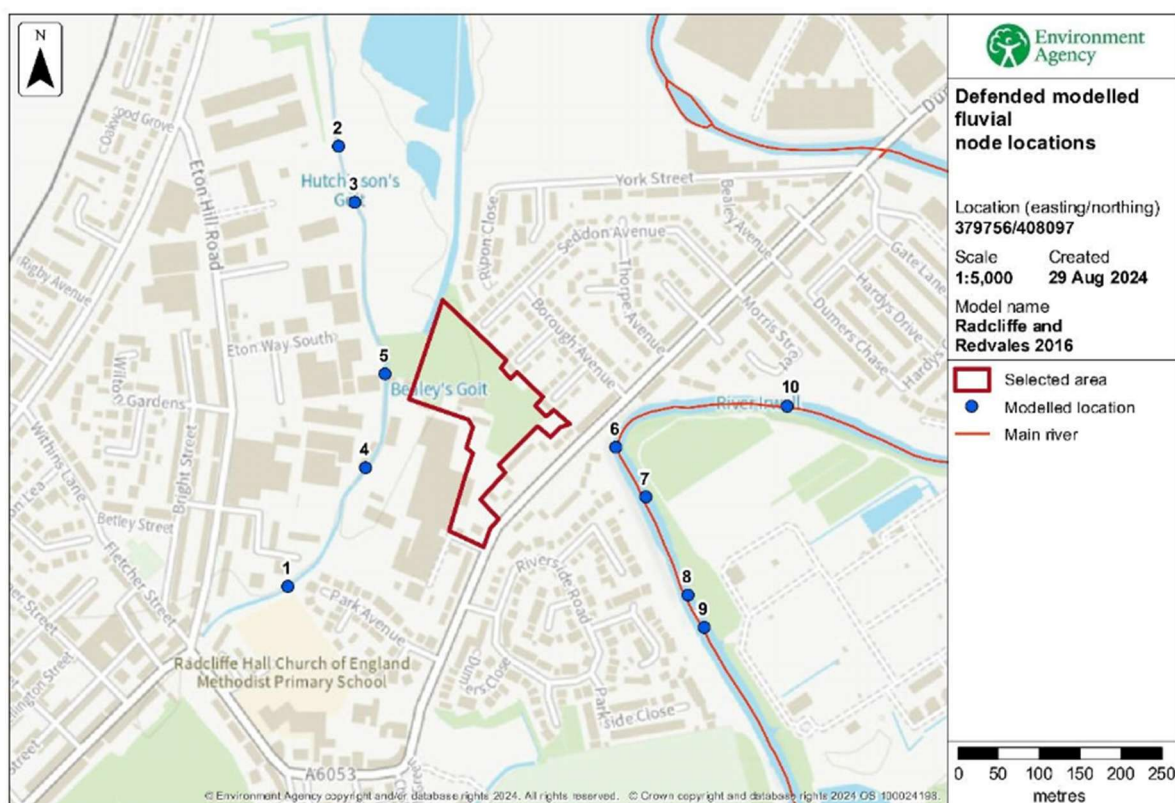


Figure 2: Flood Node Locations

Please see below a table of the flood flows provided by the EA for the 1%, and the 0.1% AEP event. Please note the flows are taken from the defended event, as these flood levels are the highest.

Table 1: Flows

Node	1% Flows (m ³ /s)	0.1% Flows (m ³ /s)	1% Event plus 35% Climate Change Flows
6	249.51	270.63*	336.84
7	265.56	354.10	358.506
8	269.93	390.24	363.15
10	244	330	329

*It should be noted that the 0.1% flow amount for node 6 is considerably lower compared to the upstream node 10 and the downstream event node 7

For the 1 in 1000 year flow event, nodes 7, 8 and 10 are all of similar value. Node 6 is noticeably lower. Therefore, we have discounted using node 6 in our calculations, as it is an anomaly.

As can be seen with nodes 7, 8 and 10, the 1% AEP plus climate change event and the 0.1% AEP event is either within 1% of each other or the 0.1 AEP year event is higher.

Therefore, it is reasonable to use the 0.1% AEP event flood level for the 1% AEP plus climate change event levels.

To rerun the model for Redvales is beyond the scale and size of this site, as the entire model throughout the area would need to be remodelled and it is unfair that a proposed social housing planning development should have to pay for the upgrade of the model.

Therefore, to be conservative, the highest 0.1 % AEP year event level provided by the EA is 67.49mAOD, taken from the defended levels provided by the EA in this area (it is the highest levels from the defend and undefended levels provided by the Environment Agency). This will be used as the 1% AEP flood event plus climate change level.

When the 0.1% AEP flood event / 1% AEP flood event plus climate change is compared to the defence levels, the 1% AEP event plus climate change is lower than the defences (the defence heights are taken from the information provided by the EA).

Please see Table 2 comparing the flood levels to the flood defence levels:

Table 2: Flood Levels and Defence Levels

Node	0.1% AEP flood level	Flood defence level on the side of the development (mAOD)
6	67.47	67.77
7	67.18	67.77
8	67.10	67.77
10	67.49	67.77

Therefore, the site is defended up to and including the 0.1% event and the site is defended up to the 1% plus climate change event. The only way the site can flood is if the defences fail. It should be noted that you would require a 1 in 100 year event plus climate change and the flood defences to fail for the site to be at risk of flooding from the River Irwell. Therefore, the probability is higher than a 1 in 100 year event plus climate change and would be called a residual risk.

Flooding Residual Risk

Reviewing the topography compared to the 1% AEP plus climate change event indicates that the majority of the site is not at risk of fluvial flooding in the 1% AEP flood event plus climate change. Please see Figure 3 indicating ground levels from LiDAR around the site. The levels indicate that the site potentially only floods from the east.

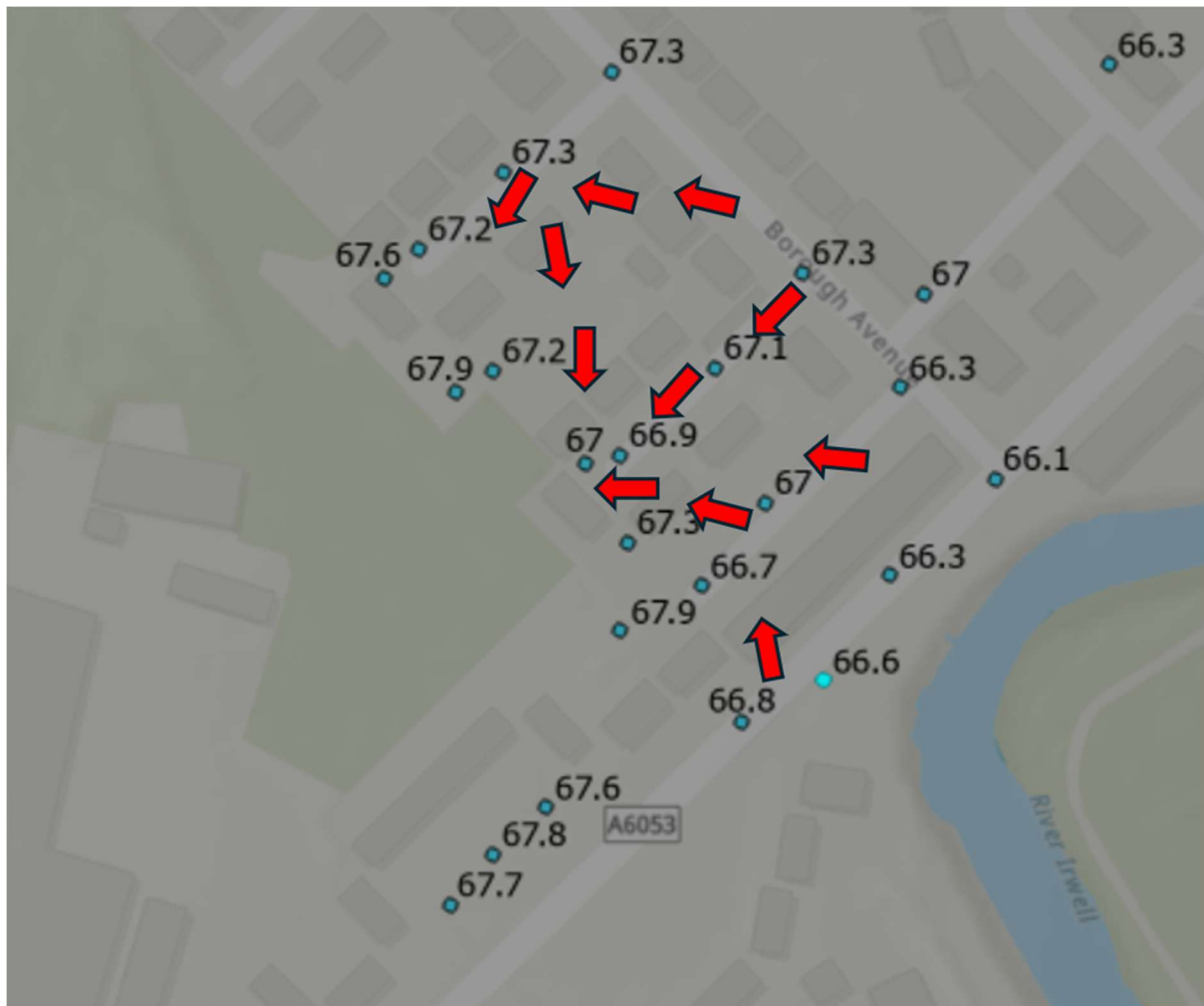


Figure 3: Levels Around Site

Please see below an extract of the topographical survey for the site. As can be seen, there is a minimal area of the site at risk of flooding in the 1% AEP flood event plus climate change.



Figure 4: The north east area of the site

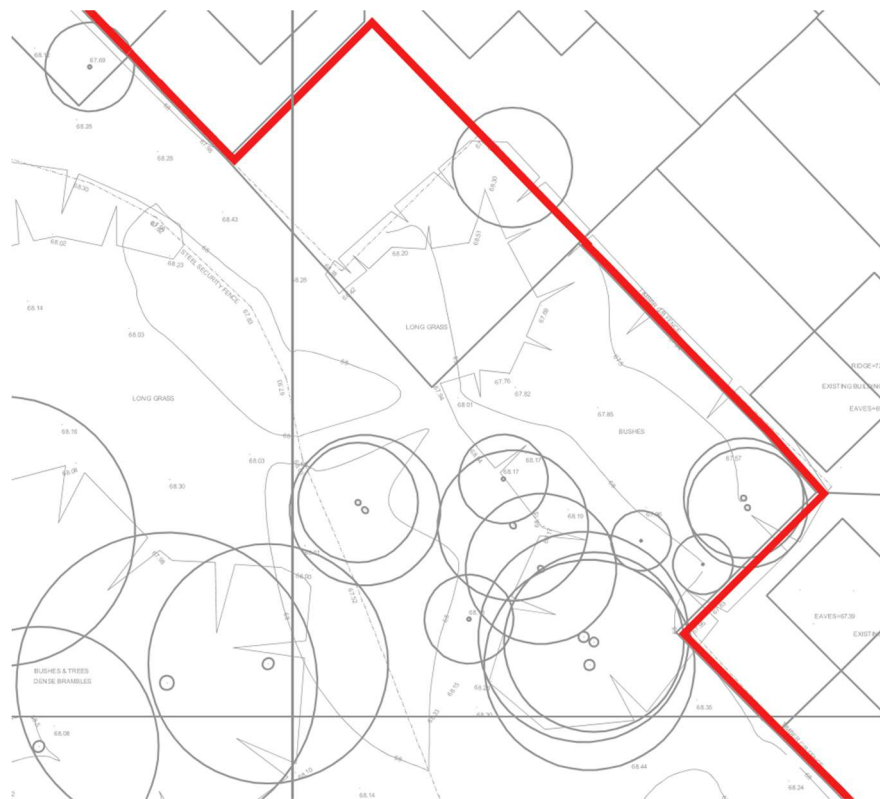
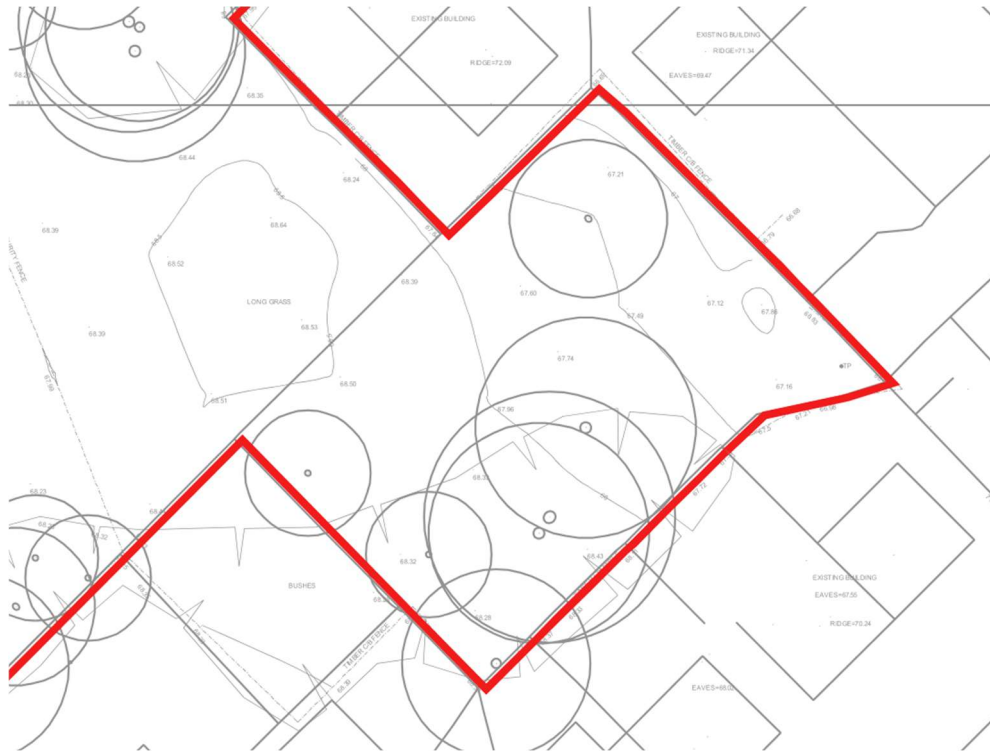


Figure 5: border of the central eastern area



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the drawing is to be used in conjunction with all relevant drawings and
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examples: measured in place dimensions but not this drawing may not be used as
evidence without prior written authority.



A1

Reasons: *The FRA currently references flood zone information from 2024. However, the most up-to-date data, including the latest National Flood Risk Assessment (NaFRA) outlines, must be used for any assessment. Please can the FRA be updated accordingly.*

The applicant has suggested that the area currently classified as Flood Zone 3 should be reclassified as Flood Zone 2, without any supporting evidence. Please

note that the Environment Agency cannot amend flood zone designations outside of our formal flood map challenge process. If the applicant wishes to pursue a formal challenge, they must submit a detailed hydraulic modelling, in line with current best practice which can be found here - River modelling standards: who they're for and how to use them - GOV.UK.

We will then review the submission and determine whether a revision to the flood map is justified.

It should be noted that the Environment Agency cannot object on policy notes, this is outside of the remit of the Environment Agency and they are NOT a statutory body for sequential or exception test. The decision on the Sequential Test and Exception Test is solely for the LPA to decide.

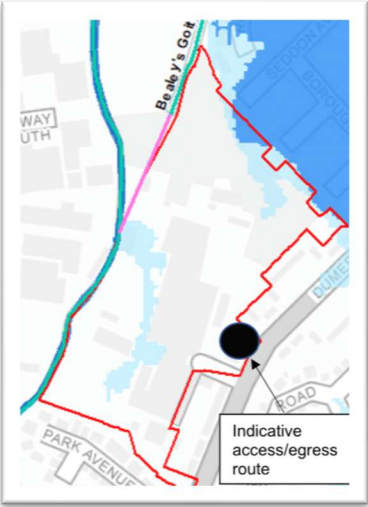
In regards to this application, the Local Planning Authority (LPA) have undertaken a sequential and exception test. According to the Appendix A of the Level 2 SFRA, they state:

Overall Site Assessment	
Can the second part of the Exception Test be satisfied as part of a site-specific FRA?	Based on existing information, it should be possible to pass the Exception Test. However, as stated by the EA, the risk from Hutchinson's Goit will need to be investigated further as part of an update to this Level 2 SFRA. Also, the risk from Bealey's Goit and the culvert must be quantified.

Figure 8: Extract Taken from the Appendix A- Level 2 SFRA site Screen Assessment Bolton to Rochdale

It should be noted that the SFRA site was for a much larger site. The western section of this site assessed in the SFRA (the former paper mill) is next to Bealey's Goit and Hutchinson's Goit. Please see below a comparison of the redline boundary of the SFRA redline boundary and this planning application.

Table 3: SFRA red line Boundary compared to Proposed Site Boundary

SFRA site	Proposed Site
	

The areas pertaining to Bealey's Goit and Hutchinson's Goit in the SFRA are not within this proposed development.

Therefore, according to the Appendix A of the SFRA, the LPA have decided that the proposed site has passed stage 2 of the exception test as this part of the site is not effected by flooding from Hutchinson's Goit. Please see the full exception test in Appendix A.

In regards to the NaFRA, these maps should not be used for Flood Risk Assessments, please see an extract from the Environment Agency's own website stating that:

The material displayed in this service, including maps and risk data, is provided without any guarantees, conditions or warranties as to its accuracy. See our [terms and conditions](#) for more information.

To produce a suitable flood risk assessment, other datasets and assessments will be needed.

Figure 9: How to use flood map for planning data - Flood Map for Planning - GOV.UK

The data that should be used is a hydraulic model, therefore, by the own words of the Environment Agency, the hydraulic model should be used and is more reliable than the NaFRA maps.

3. ***Residual Risk and Climate Change - We have reviewed the modelling for this location both current published and unpublished internal EA modelling which is not currently available for external distribution. Based on our assessment, there remains a significant residual risk to the development site. In accordance with the National Planning Policy Guidance (NPPG), the FRA must address residual risk scenarios, including defence overtopping, breach, and failure. The assessment must include relevant data such as flood depth, velocity, and duration, and these should be illustrated using hazard curves consistent with Environment Agency guidance (FD2320).***

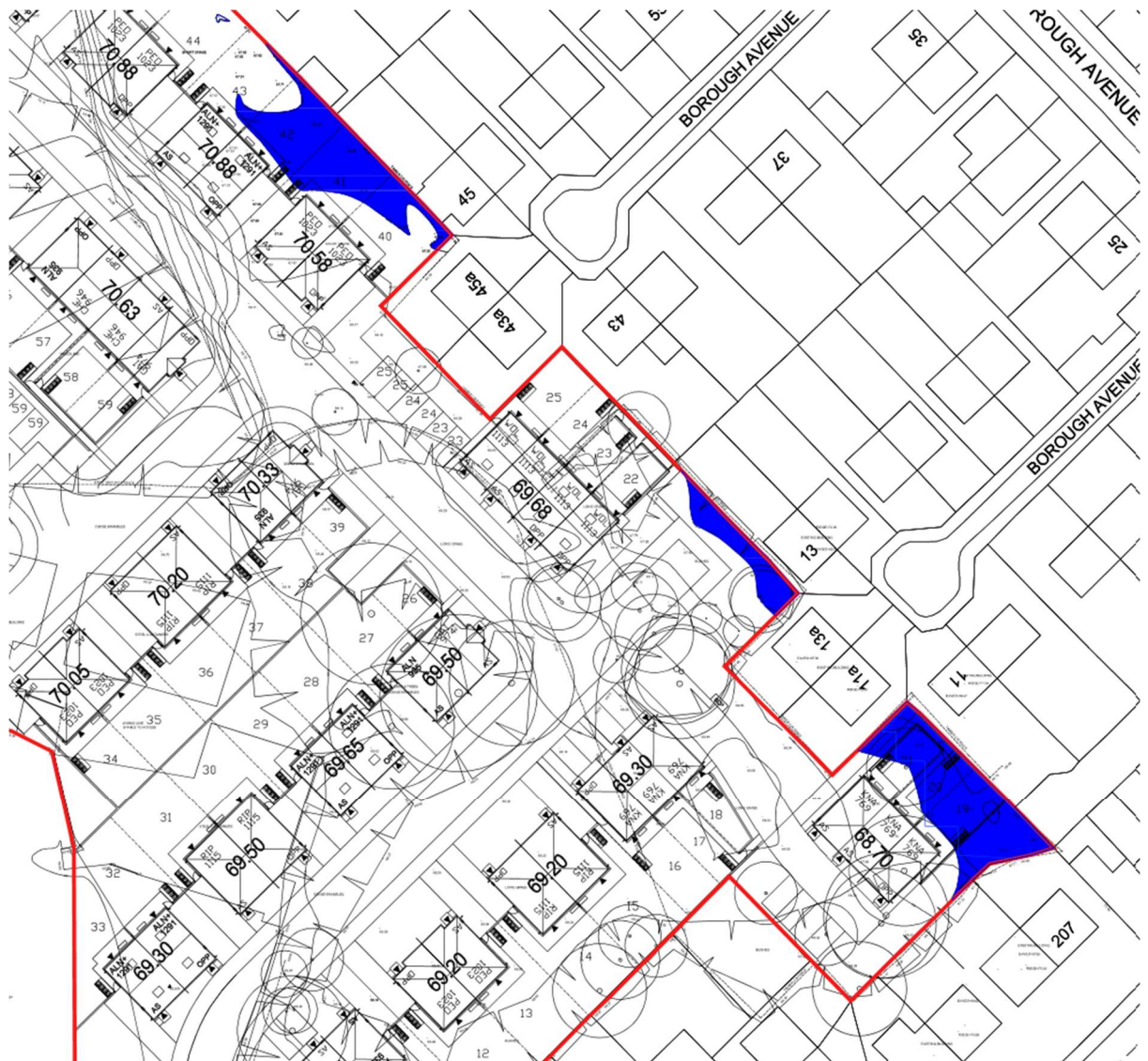
We believe this is answered satisfactory in question 1. Furthermore, there is no development within the area of the 1% AEP flood event plus climate change and the 0.1% flood event, assuming the defences fail. The finished floor levels are situated at approximately 1m over the 0.1% Flood Event and the 1% AEP Flood Event plus Climate Change. Therefore, even if the defences fail and there is a flood event of a 1 in 100 year event plus climate change, the bungalows are safe from flooding.

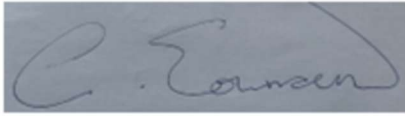
4. ***Policy Considerations and Objection Status - Should you wish to undertake further modelling, all mitigation measures must be developed in accordance with Paragraph 167 of the NPPF and relevant PPG guidance and must be reflected in an updated FRA for the Environment Agency's review. Given the 'more vulnerable' classification of residential development it is essential that the above matters are fully addressed. Until such time, we maintains its objection to the proposed development.***

Finally, please could clarification on “Burghley” drawing reference “BUR-M-113” be provided on a site plan. There is ground flood sleeping proposed so this must be accounted for in an Flood Warning, Evacuation Plan (FWEP).

As discussed in question 3, all the dwellings / maisonettes are outside of the 0.1% flood event and the 1% flood event plus climate change envelope. To further protect the maisonettes, please see below the extracts of the finished floor levels overlaid by the topographical survey.

The proposed buildings are outside of the flood outline (please remember this site only floods if the defences fail), and are 1m above the flood level. An access and egress and emergency plan is not required because the houses do not flood.



A handwritten signature in blue ink, appearing to read 'C. Townsend', is shown within a rectangular frame.

Charles Townsend, BSc (Hons) CIWEM CSci

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Mobile: 07786912617

Land line: 01244 294890

Appendix A: Topographical Survey

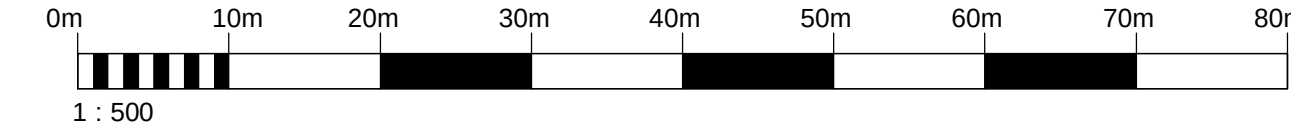
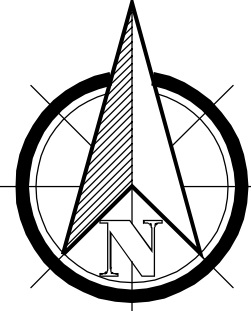
Appendix B: Flood Outline

Appendix C: Sequential and Exception Test under by the LLFA.

Appendix A: Topographical Survey

LAND OFF DUMERS LANE, RADCLIFFE

general notes:
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HOUSETYPE	BEDS	GIAsqft	GIAm2	NUMBER	TOTAL GIAft2	TOTAL GIAm2
Burghley GF	1	545	50.67	9	4905	456.03
Burghley FF	1	614	57.1	9	5526	513.9
Knarborough	2	769	71.4	6	4614	428.4
Alnwick	3	935	86.9	4	3740	347.6
Chester	3	946	87.9	3	2838	263.7
Gainford	3	974	90.5	4	3896	362
Gainford Alt	3	970	90.1	2	1940	180.2
Peover	3	1023	95.03	14	14322	1330.42
Wollaton	3	1113	103.4	10	11130	1034
Rpley	4	1115	103.6	6	6690	621.6
Alnwick +	4	1291	119.9	10	12910	1199
				77	72511	6736.85

I	30.9.25	PS	Layout amended to remove special surface & adjustments
H	4.9.25	PS	Red Edge adjusted to Wild Street
G	22.7.25	PS	Red Edge adjusted to include Wild Street Works. Visitor
F	16.06.25	KLW	Parking added.
E	28.11.24	KLW	Number of plots reduced, access relocated and all associated
D	26.11.24	KLW	amendments.
C	21.10.24	KLW	Red edge amended to exclude substation.
B	03.10.24	KLW	Red edge amended to include substation.
A	13.09.24	KLW	Bin stores shown for apartments.
		KLW	Plots around the acoustic bund reconfigured.
		KLW	Plots 61-79 adjusted and private drive amended to allow for
		KLW	acoustic bund.
		KLW	Access road relocated and plots 1-8 adjusted to suit.
		KLW	Description



Project:
BEALEY IND EST
RADCLIFFE

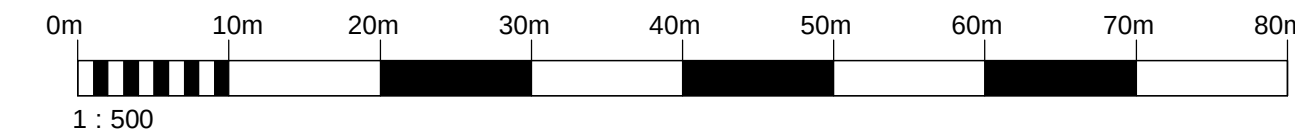
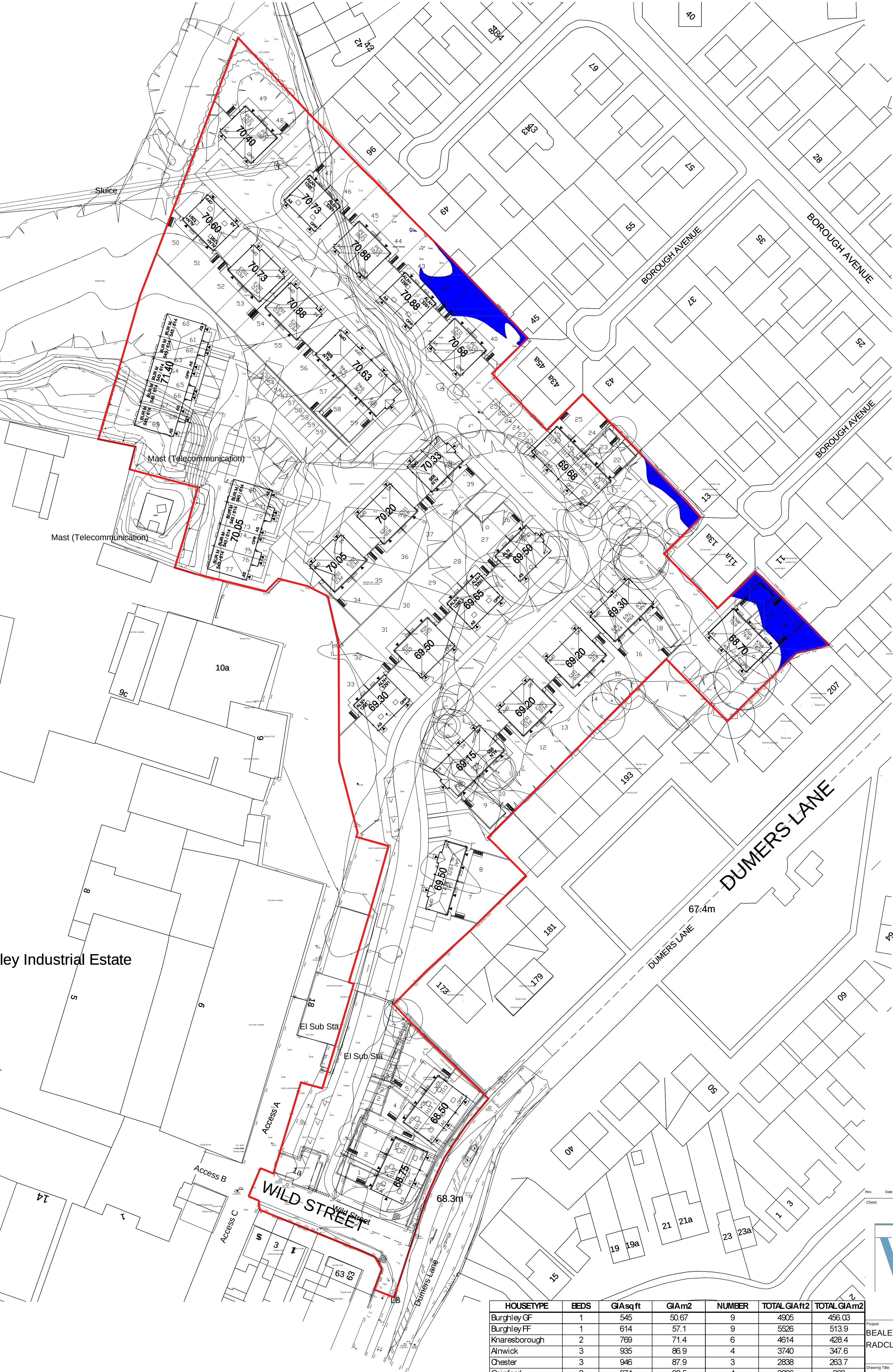
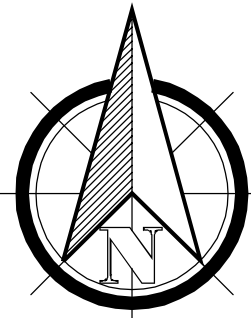
Drawing Title:
PROPOSED SITE LAYOUT
ON TOPOGRAPHICAL SURVEY

Drawn: K/W	Checked:	Scale: 1:500	Date: FEB 2025
Job No: 1025	Drawing No: SL-TP01	Rev: I	

Appendix B: Flood Outline

LAND OFF DUMERS LANE, RADCLIFFE

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Alnwick +	4	1291	119.9	10	12910	1199
				77	72511	6736.85



Project:
BEALEY IND EST
RADCLIFFE

Drawing Title:
PROPOSED SITE LAYOUT
ON TOPOGRAPHICAL SURVEY
WITH SLAB LEVELS

Drawn: PWS	Checked:	Scale: 1:500	Date: FEB 2025
Job No: 1025	Drawing No: SL-TP02	Rev:	

Sequential and Exception Test undertaken by the LLFA.

Site HL/2441/00 - Bealey Industrial Estate, Hallam Street, Off Dumers Lane, Radcliffe

Location	Dumers Lane, Bury
Site area (ha)	5.15
Watercourse	River Irwell, Hutchinson's Goit, Bealey's Goit
EA Model used	Radcliffe and Redvales 2016
Existing use	Brownfield, current industrial buildings
Existing site flood risk vulnerability classification (NPPF)	Less vulnerable
Proposed use	Residential
Proposed development flood risk vulnerability classification (NPPF)	More vulnerable
Proposed development impermeable area (ha)	4.38

Flood outlines (present day)

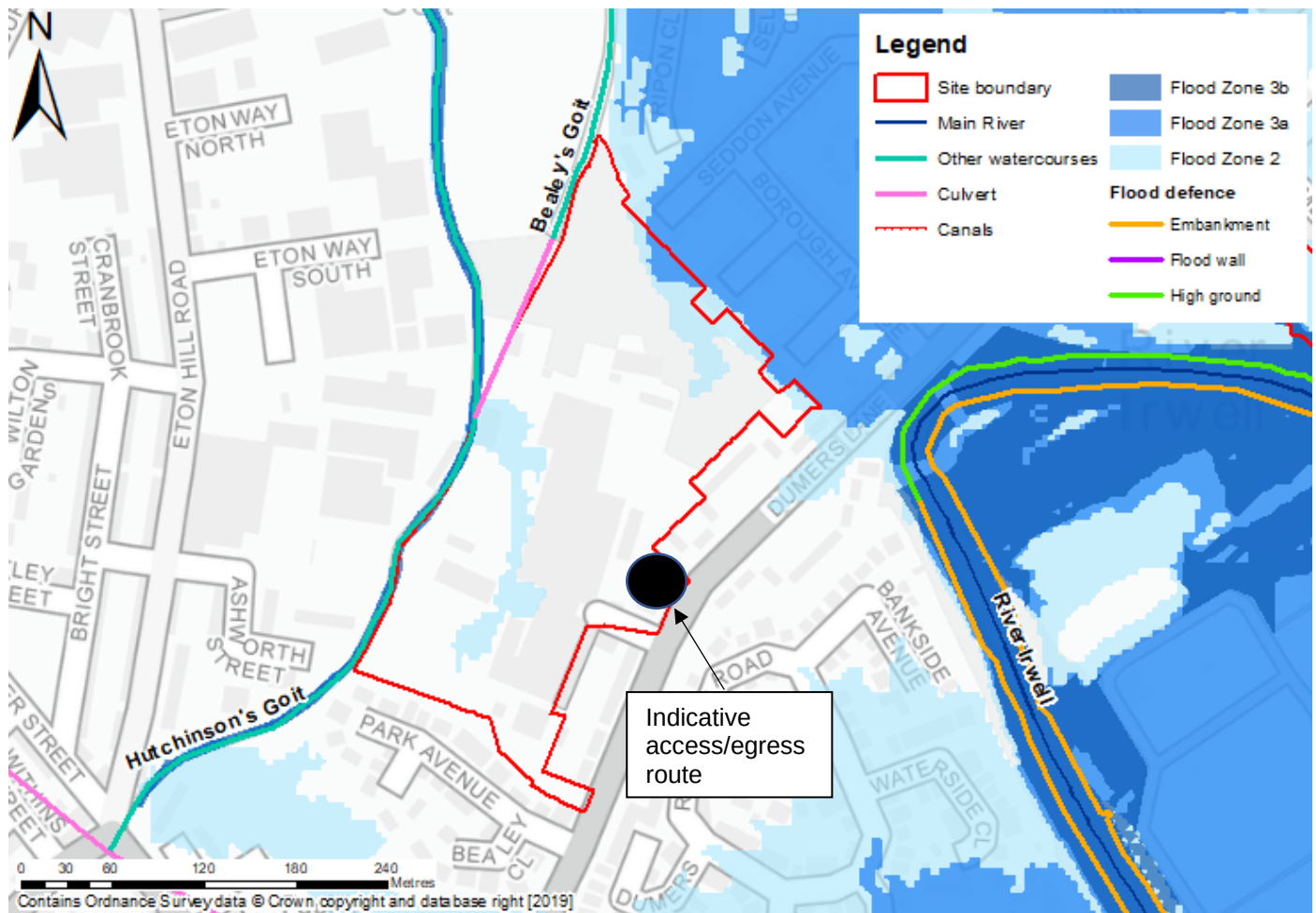


Figure 1: Site boundary with flood zone mapping (Flood Map for Planning) and flood defences

Site HL/2441/00 - Bealey Industrial Estate, Hallam Street, Off Dumers Lane, Radcliffe

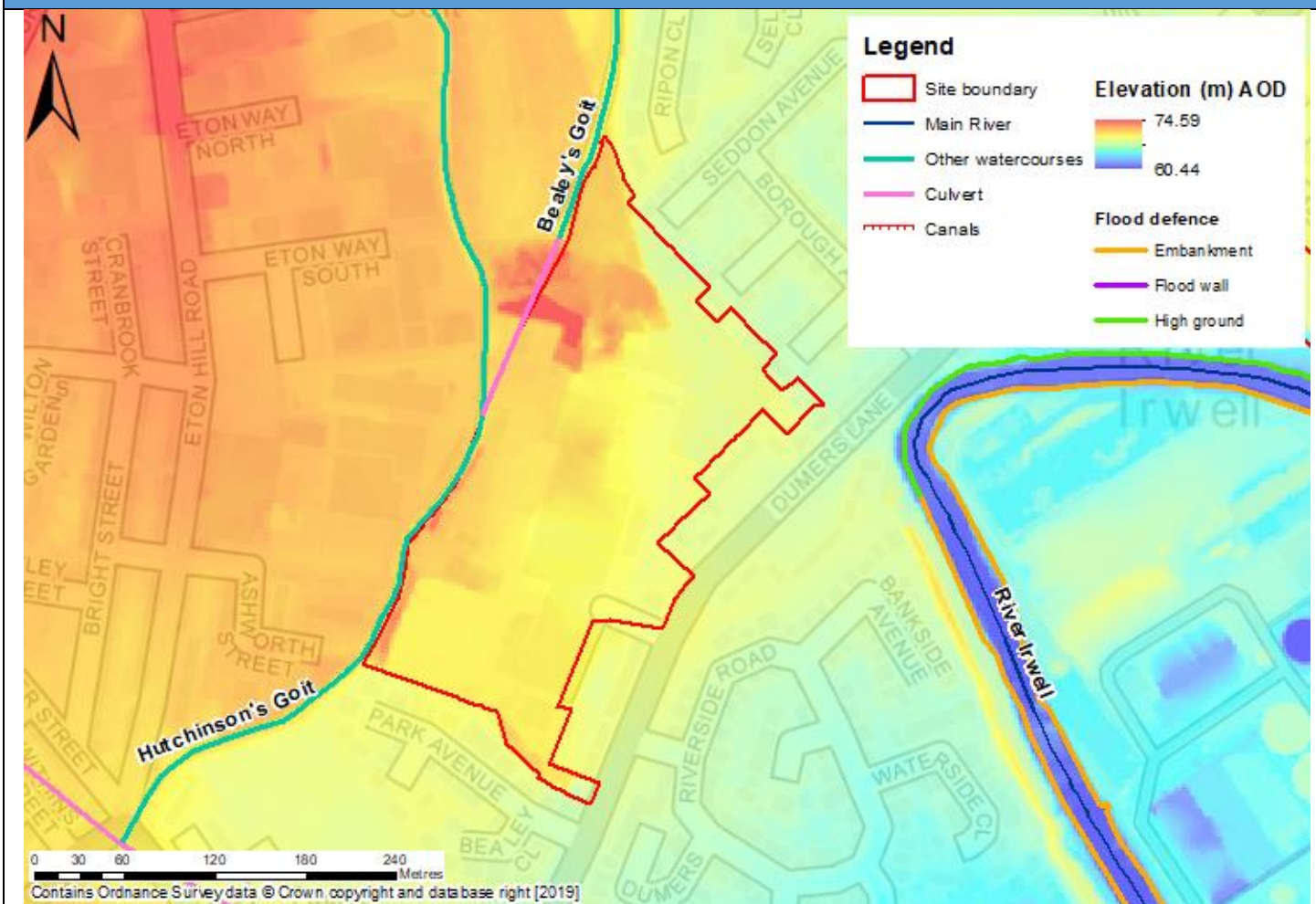


Figure 2: Site with 2m 2017 LIDAR (elevation data)

- The site lies between the River Irwell, flowing southwards, to the east and the Ordinary Watercourses of Hutchinson's Goit and Bealey's Goit to the west flowing southwards along the western boundary.
- The elevation of the site is highest in the west at an approximate elevation of 72m AOD sloping to an approximate elevation of 67m AOD in the east.
- The surrounding area also follows this trend with the north east having a higher elevation (approximately 72m AOD) which slopes down towards the River Irwell at approximately 64m AOD.

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Flood Source: Fluvial

Flood Zones (%)	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Climate Change
	0.80	0.90	11.90	5.00
Fluvial: average depth(m)	Not available	Not available*	0.04	0.03
Fluvial: maximum depth (m)	Not available	Not available*	0.14	0.13
Fluvial: average hazard	Not available	Not available*	Low	Low
Fluvial: maximum hazard	Not available	Not available*	Significant	Significant

*Note: depth and hazard information are not fully representative due to the nominal area at risk within Flood Zone 3a and therefore has not been recorded here

Site HL/2441/00 - Bealey Industrial Estate, Hallam Street, Off Dumers Lane, Radcliffe

Modelled fluvial flood risk and climate change (Radcliffe & Redvales 2016 model)

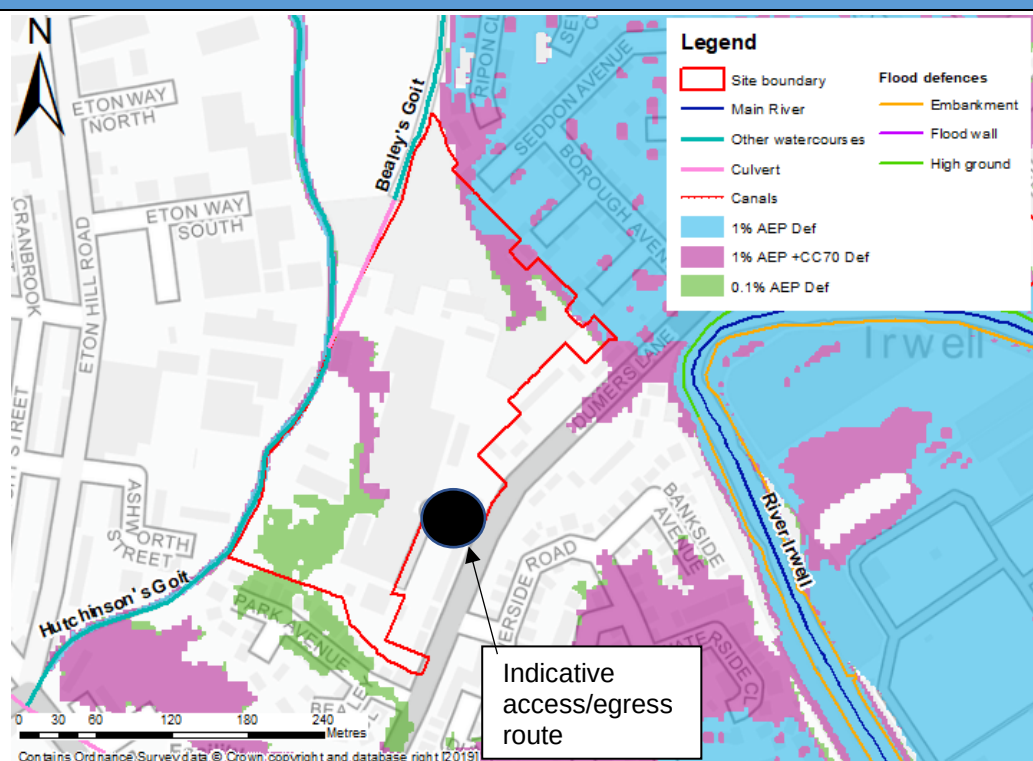


Figure 3: Defended fluvial outlines for the present day 1% AEP and future risk 1% AEP with +70% climate change uplift

- The present day 1% AEP event outline covers a very small portion of the north of the site and is equivalent to the Flood Map for Planning Flood Zone 3. This risk comes from the River Irwell.
- The +70% climate change uplift extends to cover more of the site with the northern boundary becoming inundated from the Irwell and a flow path developing from Hutchinson's Goit in the west.
- The 0.1% AEP event outline accentuates the flow path from Hutchinson's Goit through the southern part of the site and out into the surrounding area to the south.

Historic flooding

- A small area of the site along the north-eastern edge lies within the Environment Agency's Historic Flood Map (HFM).

Defences

- Based on the EA's Spatial Flood Defences dataset, the River Irwell's right bank (western bank) is bounded by informal defences of high ground and there is a raised earth embankment lining the channel of which has no Standard of Protection associated with it; the ownership of the embankment is by a third party therefore is inspected by the EA though not maintained. The condition is assessed as condition 4 meaning 'Poor' (Table 1.1 Conditions Assessment Manual¹).
- The embankment will form part of the new flood defences that, at the time of writing, are currently under construction, in Radcliffe and Redvales in that it joins the sheet piled walls at Close Park and Dumers Lane. However, it won't formally be adopted as part of the scheme.

Flood Warning Area

- A section of the east of the site lies within two EA FWAs; the FWAs are for the River Irwell at Radcliffe and Redvales, and the River Irwell at Radcliffe and Redvales wider area.

¹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291126/scho0509bqat-e-e.pdf

Site HL/2441/00 - Bealey Industrial Estate, Hallam Street, Off Dumers Lane, Radcliffe

Natural Flood Management / Working with Natural Process	The majority of the site is fully within the Urban Loss Improvement zone of the Irwell NFM dataset. This means that the potential impact of 'street trees' or 'low density urban tree planting' should be considered as one of many possible SuDS type interventions. The eastern parts of the site are within the Woodlands for Water Woodland Planting zone. Woodland creation can significantly delay the timing of the peak runoff in headwater catchments.
Observations, mitigation options & site suitability: fluvial	- Given the change in use and therefore vulnerability of the site, the developer will need to show, through an FRA, that future users of the new development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the change of use meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG). - Based on existing modelled information, it should be possible for this site to pass the Exception Test, based on the risk identified in this Level 2 SFRA. Fluvial risk is nominal with less than 1% of the site within Flood Zone 3a and also less than 1% in Flood Zone 3b with both flood events remaining in-bank. Flood Zone 3a is also isolated to the northern boundary which is currently open greenspace. - Modelled climate change (Figure 3) shows increased risk to the greenspace area in the north. Climate change modelling also reveals a flow path from Hutchinson's Goit which would need to be quantified and ideally left open to flood naturally in future. Water is shown to exit Hutchinson's Goit at the point where the culverted section of Bealey's Goit joins. This is also the point where Flood Zone 2 comes out of bank. Channel capacity issues are most likely the cause of this. Part of this area is also shown to be at surface water risk (see Figure 4). The FRA should assess channel capacity and model the flows coming from Bealey's Goit. - The Council states that the risk from the two goits can be significant but risk will be changed by EA works as the potential risk from the River Irwell over-spilling will be negated. At the time of writing, the Council states that the flows in both goits seem to have become static without the impact of the River Irwell, so are vulnerable to silting up, blockage and consequent flooding from surface water runoff. - The downstream section of Hutchinson's goit runs through the proposed development at the East Lancashire Paper Mill site and may be utilised as part of a SuDS scheme for the site. It may also be possible to similarly utilise the goits on this site which may improve flow through and reduce maintenance of the goit which forms part of this site's boundary. - The EA has stated that 'the risks from Hutchinson's Goit will need to be assessed in more detail than covered in the Radcliffe and Redvales model. The Goit has inflows along its length although the Radcliffe and Redvales FRMS proposes a flow control at the upstream end to limit out of bank River Irwell flows passing down the Goit. The Radcliffe and Redvales FRM Scheme may also have to be expanded to include storage in Swan Lodge and may use the Goit's for flow conveyance. This will require further consideration at the time of investigation'. This further work should be carried out as an update to this Level 2 SFRA. - It is noted that the Bealey's Goit watercourse is not included within the model or the Flood Map for Planning and that it is culverted for around 130 metres along the site boundary and into Close Park. The risk associated with this watercourse and culvert should be quantified through flood modelling and mapping as part of an update to this Level 2 SFRA. There will be residual risk associated with this culvert which should be assessed through blockage scenario modelling. Capacity and condition survey

Site HL/2441/00 - Bealey Industrial Estate, Hallam Street, Off Dumers Lane, Radcliffe

	would be required to inform the modelling together with ownership and maintenance information. Access to the culvert will be required at all times, therefore development of this site should not obstruct such access. • Options should be sought to look into culvert removal, where feasible. Modelling would be required to ascertain effects on flood risk and possible WFD benefits. • Site design may look to incorporate this flow path into the site layout as a blue/green corridor or through appropriate SuDS. However, infiltration SuDS may not be feasible here given the site is brownfield. Ground investigation and contaminated land assessments will be required. • Development within 8 metres of Hutchinson's Goit and Bealey's Goit is not permitted. This is advised by the EA for watercourse access and maintenance purposes. • Safe access and egress routes are available along the majority of Dumers Lane. Site design and layout should further investigate the indicative locations shown on Figure's 1, 3 and 4 of this Level 2 SFRA. • The raised earth embankment on the Irwell may have 'defects that would significantly reduce the performance of the asset' and also does not have a specified Standard of Protection (SoP). A condition inspection survey will be required to determine any repair works required and to designate a SoP.
Flood Source: Groundwater	
Flood risk: groundwater	• Due to the site's proximity to the River Irwell and Hutchinson's Goit, groundwater levels are expected to be similar to the corresponding levels in the river. Groundwater will follow topography and is unlikely to be an issue in this instance.

Site HL/2441/00 - Bealey Industrial Estate, Hallam Street, Off Dumers Lane, Radcliffe

Flood Source: Infrastructure Failure – Reservoirs (Residual)

Flood risk: reservoir

- Approximately 62% of the site is located within the maximum extent of flooding risk from reservoirs according to the EA's Reservoir Flood Map (RFM) with the average depth being above 2m. The larger depths are to the east side of the site with the west having lower depths of between 0.3m and 2m. Follow the link to view the RFM online: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>
- The extent shows the worst credible area that is susceptible to dam breach flooding. The map should be used to prioritise areas for evacuation/early warning.
- The extent of reservoir inundation from three United Utilities owned reservoirs (Ogden Haslingden, Clowbridge and Calf Hey) only partially inundates the northern boundary of the site. The extent to the majority of the site comes from one United Utilities owned reservoir (Watergrove) and one owned by the Canal & Rivers Trust (Elton).
- Much of the reservoir network is owned and managed by United Utilities who monitor and maintain reservoirs as required.
- The chance of reservoir failure is very rare and there is an extremely good safety record in the UK with no loss of life due to reservoir flooding since 1925.
- United Utilities' ongoing management of reservoirs ensures they do not cause flooding as their presence within the network of surrounding watercourses actually reduces the impact of excess rainfall.
- All United Utilities operated reservoirs are managed in accordance with the Reservoirs Act and relevant Health and Safety legislation to ensure they do not fail such requirements. United Utilities also notes that the Environment Agency is responsible for ensuring compliance with the highlighted legislation.
- United Utilities also wishes to highlight the drive for continued constructive communication with the relevant local authorities to ensure a coordinated approach to the delivery of site allocations. United Utilities are committed to continuing to work with the relevant Local Authorities and the Greater Manchester Combined Authority as site allocations progress further.

Flood Source: Infrastructure Failure – Canals (Residual)

Flood risk: canal

- No canals in the vicinity of the site.

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Flood Source: Surface Water

Surface Water Flood Risk to Proposed Development Site

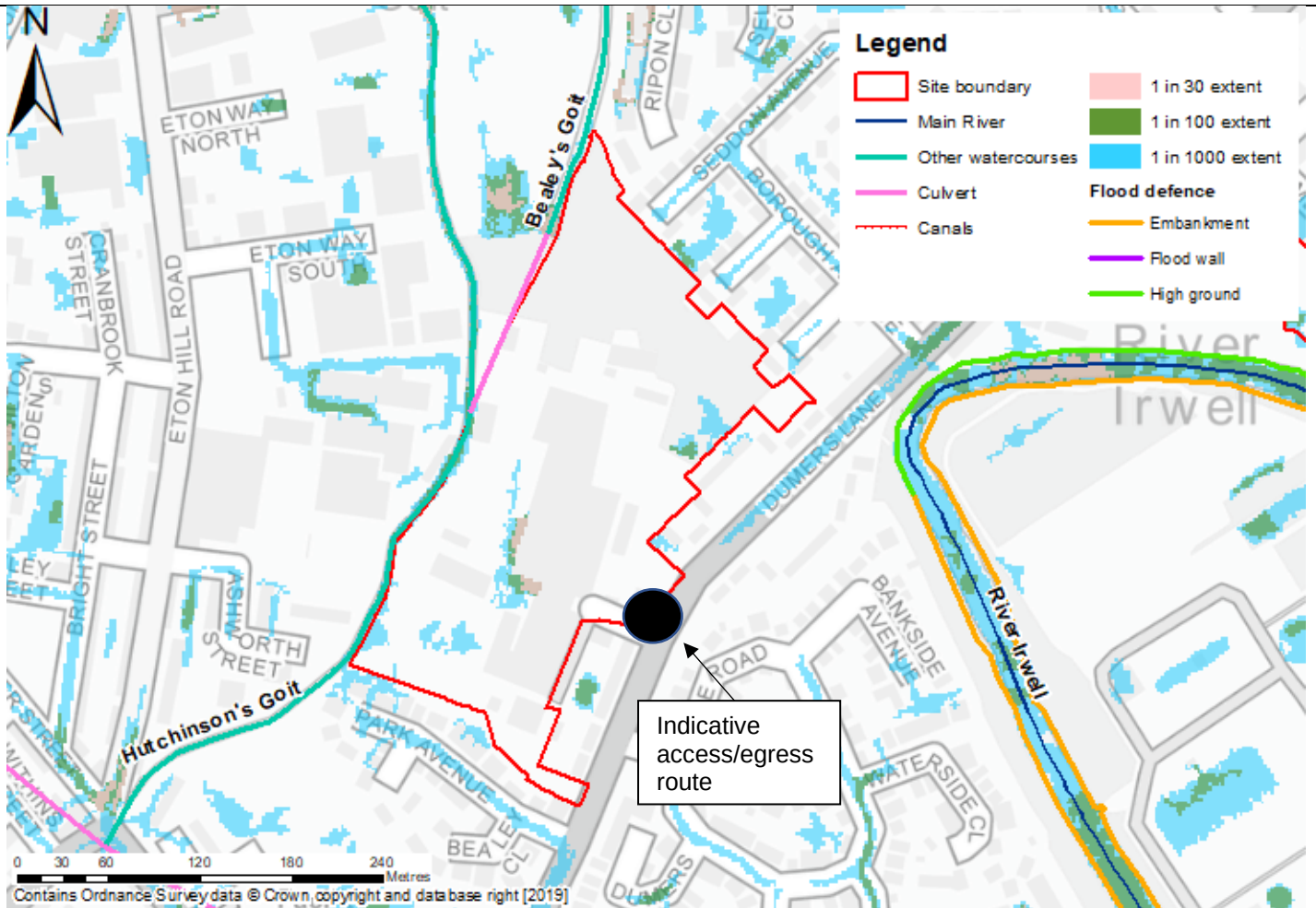


Figure 4: Surface water risk to the site (Risk of Flooding from Surface Water map)

Existing development: Risk of Flooding from Surface Water map (%)	High Risk (1 in 30 AEP outline)	Medium Risk (1 in 100 AEP outline)	Low Risk (1 in 1000 AEP outline)
	0.49	1.38	5.42
Surface water flooding depths	Max: 0.30 – 0.60m	Max: 0.30 – 0.60m	Max: 0.30 – 0.60m
Surface water hazards	Max: Moderate Mean: Low	Max: Moderate Mean: Low	Max: Significant Mean: Low
Surface water flood risk to development site	- The site is generally at very low risk of surface water flooding with the exception of localised ponding contained by the current development (at the centre of the site and in the north eastern area) based on the 3.3% and 1% AEP event outlines. The central ponding area is within the fluvial flow route from Hutchinson's Goit. - Safe access and egress are achievable via Dumers Lane based on the 1% AEP outline.		
Climate change	- The current day 0.1% AEP outline provides an indication of the likely increase in extent of the more frequent events. - The 0.1% AEP outline affects several roads around the site however the		

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	indicated route to Dumers Lane should provide safe access and egress.
Mitigation options & site suitability: surface water	- Development should avoid the 1% AEP event surface water outline. This should be possible given the nominal areas at risk. - It is envisaged that the current onsite buildings, car parks and roadways will be demolished, and a new layout will be in place. The FRA should assess the current drainage system in place, given the site is currently developed, to ascertain whether the current system could accommodate residential development or whether further capacity is required. A full drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on proposed layout plans as part of a site-wide drainage strategy. - UU states the following requirements: - Applicants will be expected to manage surface water through sustainable drainage features that provide multi-functional benefits as opposed to a reliance on underground conventional piped and tanked storage systems. - The design of new development should consider the inclusion of water efficiency measures in the development of new buildings as way to further reduce flood risk. New development can become more resilient to climate change by encouraging water efficiency measures including green roofs, water saving and recycling measures to further minimise flood risk. Such a proactive approach is designed to adapt new development to climate change, whilst additionally having due consideration for water use in Greater Manchester. - For the purposes of this assessment, the required volumes of attenuation have been calculated below based on an assumed 85% impermeable area and limiting greenfield runoff rate of Q_{bar} (l/s). It is noted that greenfield runoff rates and volumes may not be achievable for development of brownfield sites, therefore, values as close as reasonably practicable may be agreed with the LLFA.

Surface Water Flood Risk from Proposed Development

Proposed development limiting runoff rate: (l/sec)

Q_{bar} : 59 l/s (FEH Statistical)

Design flood event (incl climate change)	Critical storm duration Hrs	Inflow volume m ³	Outflow volume m ³	Attenuation required m ³	Time to empty (assuming no infiltration) Hrs	Total storage required: Area (ha) and % of site area
30yr Rainfall + 20%	4.25	2452	632	1820	12.2	0.121 ha 2.356 %
30yr Rainfall + 40%	5	2980	743	2237	15.0	0.149 ha 2.896 %
100yr Rainfall + 20%	5.5	3428	818	2610 (790m ³ of exceedance storage)	17.5	0.174 ha 3.379 %
100yr Rainfall + 40%	6.5	4158	966	3192 (955m ³ of exceedance storage)	21.4	0.213 ha 4.132 %
Climate change	Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated					

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	attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.
Surface water: flood risk impacts from development site, mitigation & SuDS	- As part of this Level 2 Screening we have included calculations to provide an estimated land take if a pond with an assumed depth of 1.5m was included as part of the development. - Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.
Overall Site Assessment	
Can the second part of the Exception Test be satisfied as part of a site-specific FRA?	Based on existing information, it should be possible to pass the Exception Test. However, as stated by the EA, the risk from Hutchinson's Goit will need to be investigated further as part of an update to this Level 2 SFRA. Also, the risk from Bealey's Goit and the culvert must be quantified.
Recommendation summary	- Early discussions should take place with the Environment Agency with regards to flood risk issues on this site. The Environment Agency offers early engagement through an advisory service via their website (https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals) or by emailing the local office: SPPlanning.RFH@environment-agency.gov.uk - The investigation into Hutchinson's Goit should be carried out before the FRA stage i.e. as part of an update to this Level 2 SFRA. As should the flood modelling of Bealey's Goit to ascertain risk to the site, including for climate change. This should include culvert capacity and condition surveys and survey of the Hutchinson's Goit channel capacity at and downstream of the junction with the culvert. The culvert should also be subject to blockage scenario modelling to ascertain residual risk. All fluvial modelling should be subject to consultation with the LLFA and the EA. - Safe access and egress routes during times of flood should be designated early in the site design process. - The developer should consult with the EA regarding the raised embankment on the Irwell and its current condition/future maintenance plans. - The current site boundary should be pulled back from Hutchinson's Goit and Bealey's Goit watercourses or need to at least account for the 8 m buffer.
FRA requirements	- The FRA should include surface water modelling based on proposed layout plans as part of a site-wide drainage strategy. The drainage strategy should assess current drainage arrangements. The Level 2 SFRA Main Report details UU's requirements for a drainage strategy. - The FRA should calculate storage requirements for the recommended open greenspaces. - An assessment of the condition of the raised embankment on the Irwell should be carried out along with consultation with the EA on future maintenance of the defence. - The FRA should include emergency planning procedures with particular consideration to safety around the adjacent watercourses and safe access and egress routes in times of flood. - Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance; GMSF and District Council Local Plan policies; and national SuDS policy and guidelines, in the absence of any local SuDS policy or guidelines. - Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and emergency services.