Lubrizol Ltd

FLOOD RISK ASSESSMENT AND OUTLINE DRAINAGE STRATEGY

LBZ-WSP-XX-ZZ-RP-C-002
JANUARY 2024

PUBLIC

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APPENDICES

1. INTRODUCTION

1.1. APPOINTMENT AND BRIEF

1.1.1. WSP has been commissioned by Lubrizol Limited to undertake this Flood Risk Assessment and Outline Drainage Strategy (FRA & ODS) to accompany the planning application for the construction of a canopy covered storage area and associated storage yard (hereafter referred to as the 'Proposed Development') to supplement their existing operations. The Proposed Development, located within the Syngenta site on Leeds Road, Huddersfield, HD2 1YU, is shown in **Appendix A** (hereafter referred to as the 'Site'). This report relates solely to the above Site.

1.1.2. This report is intended for the sole benefit of the parties named above and shall not be capable of assignment. WSP shall not be liable for any use of the report for any reasons other than that for which the report was originally prepared and provided.

1.1.3. Although this report was prepared using the degree of skill and care ordinarily exercised by engineers practicing under similar circumstances please note that WSP cannot take responsibility for errors in the information provided by third parties.

1.2. OBJECTIVE OF STUDY & METHODOLOGY

1.2.1. This report investigates flood risk on site and in the area and establishes the mitigation measures required to ensure the sustainability and safety of the Proposed Development over its lifetime.

1.2.2. The report has been produced in line with the requirements of the NPPF and the Environment Agency (EA) Standing Advice and Kirklees Council as the Lead Local Flood Authority (LLFA) guidance.

1.2.3. A site visit was undertaken in February 2024 by representatives of the WSP team to identify any flood risk sources that may affect the site and to assess the existing drainage arrangement.

1.2.4. The following documents and policies have been reviewed to inform this report:

- Calder Strategic Flood Risk Assessment (SFRA) (2016);
- Kirklees Local Flood Risk Management Strategy (2024);
- Kirklees Council Local Plan (2019);
- West Yorkshire Combined Authority (WYCA) Flood Risk and Sustainable Drainage Guidance;
- Lubrizol Huddersfield Flood Procedures document (January 2024);
- WSP (Syngenta) Huddersfield Manufacturing Centre Flood Risk Assessment (2013);
- Topographical Survey on Martin Walsh Architectural Existing Site Plan, Rev P2 (29/10/2024);
- Syngenta Clearwater and Effluent Drainage Survey (28/01/2019);
- Rogers Geotechnical Services Ltd Phase 1 Environmental Desk Study (January 2022) incorporating Groundsure report (December 2021);
- Rogers Geotechnical Services Ltd Phase 2 Geo-environmental Investigation report (March 2022);
- EA enquiry response with site-specific flood risk modelling data;
- British Geological Society (BGS) Online Viewer, 1:50,000 Bedrock and Superficial deposits;
- DEFRA's online Magic Map; and
- GOV.UK's online Long Term Flood Maps.

1.2.5. This report makes use of third party information and contains EA information © Environment Agency.

2. EXISTING SITE

2.1. SITE LOCATION

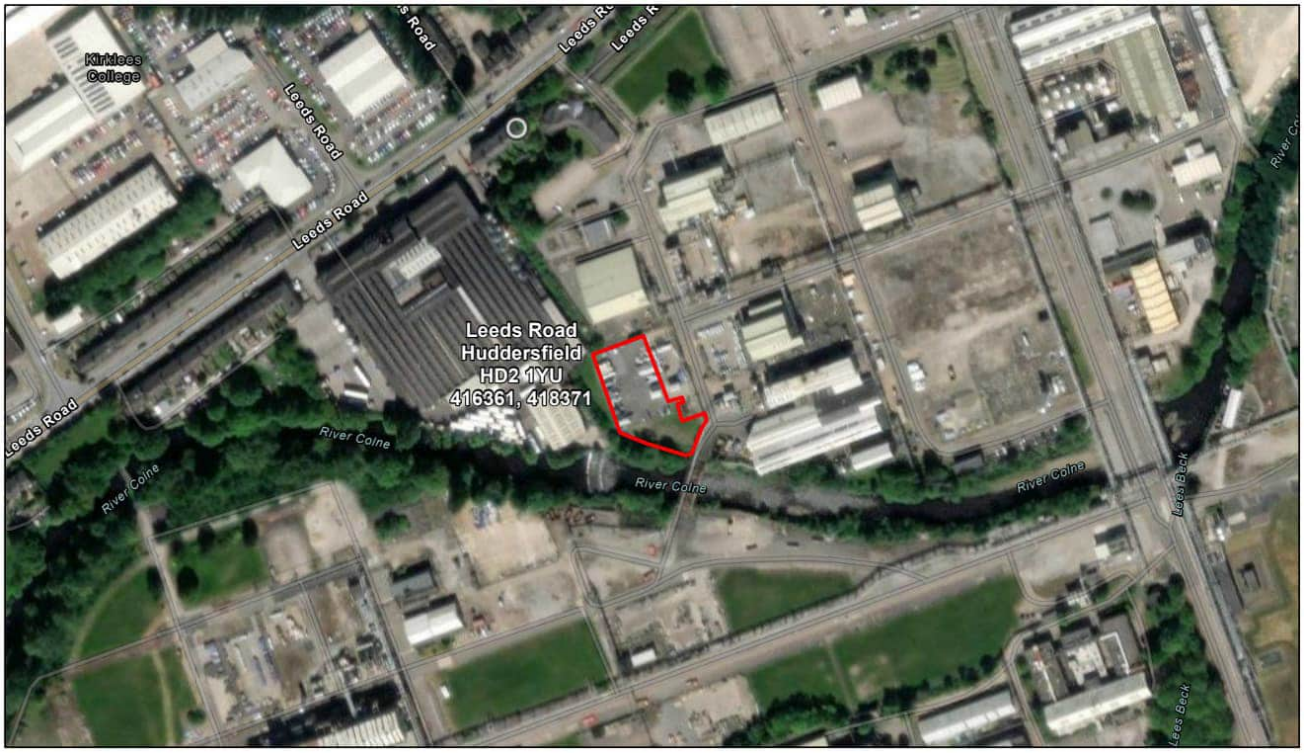
2.1.1. The Proposed Development is located beside the existing Lubrizol operation site within the Syngenta Huddersfield Manufacturing Centre on Leeds Road, Huddersfield. The Site is bound by existing buildings to the east and west and the River Colne lies to the south. There is an access road to the east and hardstanding storage area to the north. The OS Grid Reference for the approximate centre of the Site is National Grid Reference 416370, 418365.

2.2. SITE DESCRIPTION

2.2.1. The Site comprises an area of 0.236 hectares (ha) and currently consists of a hardstanding storage area and undeveloped landscape. Refer to **Figure 2-1** and **Appendix A** for an Indicative Site Location Plan.

2.2.2. The Site is generally flat with levels along the western boundary ranging from 54.57m AOD to 54.36m AOD falling to a drainage channel located on the eastern boundary with levels approximately 54.16m AOD. Levels in the centre of the Site are approximately 54.30m AOD. Levels in the grassed area to the south are slightly elevated ranging from 54.41m AOD to 54.69m AOD. Refer to **Appendix B** for a copy of the Topographical Survey.

Figure 2-1 - Indicative Site Location Plan



2.3. GEOLOGY AND HYDROGEOLOGY

2.3.1. The British Geological Survey (BGS) 'Geology of Britain' online maps indicate that the Site is situated on a bedrock of Pennine Lower Coal Measures Formation of mudstone, siltstone and sandstone. The Site is overlaid with superficial deposits of alluvium (clay, silt, sand and gravel).

2.3.2. The Phase 2 Geo-environmental Investigation report summarised the site ground conditions as follows:

Table 2-1 – Summary of RGS Phase 2 Geo-environmental Investigation report

Item	Summary
Published Geology	Superficial geology – Alluvium. Solid geology – Pennine Lower Coal Measures Formation.
Strata Conditions	Variable thickness of made ground, albeit limited to 1.2m depth, underlain by variably graded granular alluvial soils. 0.6 – 1.2 MADE GROUND (Granular) 0.9 – 1.1 MADE GROUND (Cohesive – Reworked) 1.4 – 3.0 ALLUVIUM (Clayey silty SAND) 4.1 – 4.45+ ALLUVIUM (Clayey silty very gravelly SAND – locally organic) 2.95 – 5.5+ ALLUVIUM (Very sandy GRAVEL)
Groundwater	Groundwater strikes were recorded at depths between 2.4m and 3m depth.
Contamination	No contaminants found to exceed screening levels, however elevated levels of carbon dioxide detected during gas monitoring programme.

2.3.3. Aquifer designation has been obtained from DEFRA's online Magic Map. Both the superficial deposits and bedrock for the entire Site are classified as Secondary A Aquifers. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

2.3.4. Source Protection Zones (SPZs) are defined around large and public potable groundwater abstraction sites. The purpose of SPZs is to provide additional protection to safeguard drinking water quality. According to the DEFRA's online Magic Map, the Site is not located within 500m of a Source Protection Zone.

2.3.5. Based on online Groundwater Vulnerability mapping, the Site is located within a medium-high risk category, based on the likelihood of a pollutant reaching the groundwater, the types of aquifer present and the potential impact.

2.4. EXISTING WATERCOURSES, FLOOD DEFENCES AND STRUCTURES

2.4.1. The River Colne, classed as a 'Main River' by the EA, flows west to east adjacent to the northern boundary of the Site. OS mapping identifies a weir upstream and a bridge crossing on the downstream end of the River Colne as it passes the Site.

2.4.2. The Lees Beck / Fenay Beck, classed as a 'Main River' by the EA, flows south to north discharging into the River Colne downstream of the Site. Sections of the beck are culverted upstream of its discharge point to the Colne.

2.4.3. Blackhouse Dike, classed as a 'Main River' by the EA, flows north to south discharging into the River Colne upstream of the Site. Sections of the river are culverted before its discharge to the Colne.

2.4.4. The Huddersfield Broad Canal flows west to east to the north of Leeds Road.

2.4.5. EA Product 4 data (**Appendix C**) identifies a flood defence wall approximately 670m upstream of the Site and two flood defence walls approximately 850m downstream of the Site which are maintained by the EA.

2.5. EXISTING SEWERS/ DRAINAGE

2.5.1. Lubrizol has provided record drawings which include on-site drainage information and private drainage within the wider Syngenta site. The existing drainage on and adjacent to the site is identified in the drainage layout drawings in **Appendix E** and shows the following:

- There is a 225mm diameter effluent water drain running south to north within the access road, east of the site.
- There is a bunded sump with associated storage and pump system to the east which is connected to the existing combined water site wide drainage network. When the sump reaches 75% of its capacity, an alarm triggers the next steps – a sample of the effluent is taken and the pumps are started.
- There is a channel drain running the full length of the existing hardstanding area (which is to be covered) which drains to the sump.

2.5.2. In addition to supplying comprehensive drainage record information, during the site visit in February 2024, Lubrizol staff guided the design team representatives around the site, providing them with a thorough overview of the existing drainage infrastructure. The current drainage strategy at the site includes established connections to the broader Syngenta drainage network, facilitated through the use of an existing sump tank that collects runoff from the existing ground-level areas.

2.5.3. When the sump tank reaches a predetermined capacity, a sample of the contained water is collected for analysis. Once the sample process is completed, the water is pumped into the nearby Syngenta effluent drain. From there, the Syngenta sewer system channels the water to an on-site effluent treatment plant. This plant is designed to process the water effectively before it is discharged at an agreed rate into the public sewer system. The discharge is carried out under the parameters of a Yorkshire Water discharge consent, which is both managed and held by Syngenta, ensuring compliance with all relevant regulatory requirements.

2.5.4. Lubrizol have a service level agreement with Syngenta which specifies limits on the effluent that is transferred to the Syngenta effluent treatment plant including the following:

Parameter		Lubrizol West Island Limits
COD (mg/l)		1,610
COD load (kg/day)		1,670
Nitrification Inhibition (EC_{50} x dilution)		< x53
Respiration Inhibition (EC_{50} x dilution)		< x8
Ammoniacal nitrogen (mg/l)		118
Ammoniacal nitrogen load (kg/day)		123
1,2-dichloroethane (µg/l)		150
Toluene (mg/l)		2.6
Algal toxicity (EC_{50} x dilution)		< x15
Daphnia toxicity (EC_{50} x dilution)		< x15

2.5.5. There are no Yorkshire Water public sewers in the vicinity of the Site and Lubrizol holds no discharge consent with the EA.

2.6. HISTORIC FLOODING

2.6.1. Historic Flood Mapping (SFRA) does not identify any DG5 Register incidents (Yorkshire Water Services) or Breaches/Overtopping (Canal & River Trust) in the vicinity of the site.

2.6.2. The EA response confirmed no known flood history for the site but included some flood history information for areas both upstream and downstream of the site along the River Colne. The EA historic flood map and data is included in **Appendix C**.

2.6.3. The LFRMS shows numerous LLFA recorded locally significant flood incidents within 200-500m of the site and EA recorded flood outlines along the Fenay Beck, refer to **Figure 2-2**.

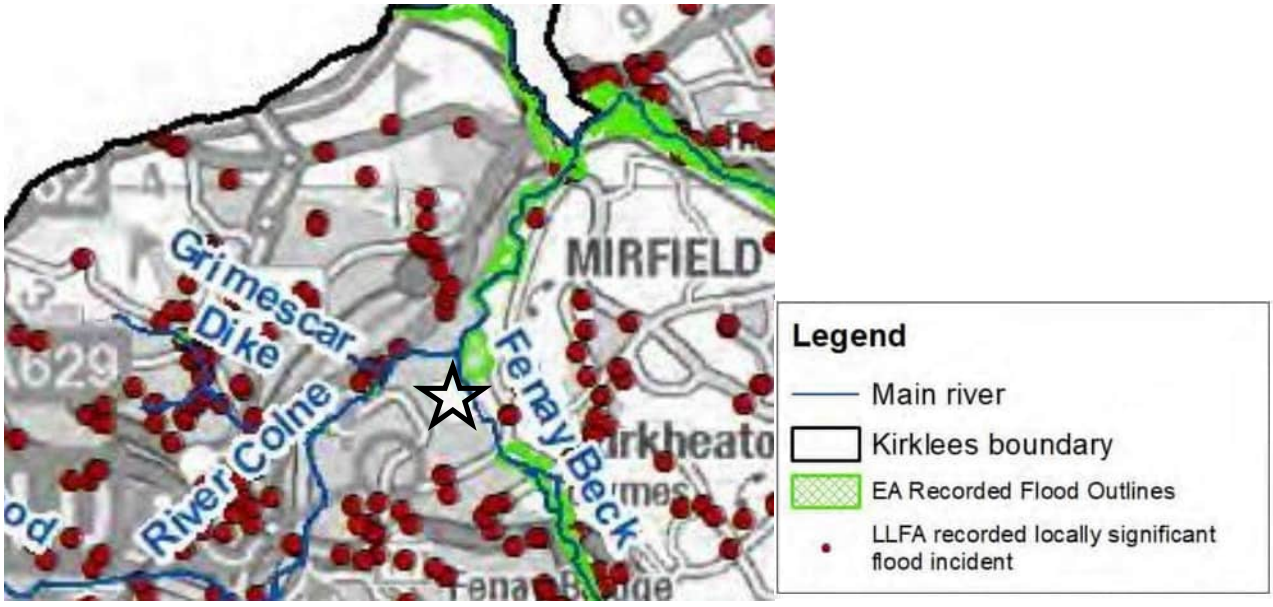


Figure 2-2 - Extract of LFRMS Historic Flooding Events Map

2.6.4. Syngenta and Lubrizol maintain a register of flood warnings and events and the Syngenta FRA identifies records from nine incidents between November 2000 and July 2012. Although the wider site is prone to flooding, the Site of the proposed development has not experienced any flooding due to

its location on higher ground. In the last ten years Lubrizol recorded four major flood events (classed as 1 in 100 year floods) and confirmed that not one affected the Site.

2.6.5. The existing Lubrizol Site Flood Procedures document lists the following historical flood data:

- Lubrizol Huddersfield last flooded in October 2023
- The highest water level recorded was 54.4 metres
- It took 7 hours to reach full flood warning at 53.0 metres.
- It took 11 hours to rise from 51.4 metres to its peak of 54.4 metres.
- Its peak rate rise was 0.5 metres/hour

2.7. CLIMATE CHANGE

BACKGROUND INFORMATION

2.7.1. The Climate Change Adaptation Sub-Committee Progress Report 2014 explained that increased flood risk is the greatest threat to the UK from climate change. More frequent short-duration, high intensity rainfall and more frequent periods of long-duration rainfall could be expected. Sea levels are also expected to continue to rise.

2.7.2. New EA guidance "Flood risk assessments: climate change allowances" issued in 2016 and updated on 27th May 2022 provides up to date information on expected changes in rainfall, river flows and sea level rise as a consequence of climate change.

2.7.3. For peak rainfall the EA guidance provides an upper end and central allowance depending on epoch; the guidance recommends assessing both the central and upper end allowances to understand the range of possible impacts. These allowances are detailed in Table 2 (Peak rainfall intensity allowance in small and urban catchments) of the EA guidance.

DEVELOPMENT LIFESPAN AND CLIMATE CHANGE ALLOWANCES

2.7.4. The PPG states that non-residential developments should be considered to have a minimum lifetime of 75 years (paragraph 2.1.5).

2.7.5. The EA guidance states that in flood zones 3a the central allowance for peak river flows should be used for 'less vulnerable' developments.

2.7.6. The contingency allowance for peak river flow climate change that is applicable to this site is therefore as follows.

Peak River Flows (Aire and Calder Management Catchment):

- 2080s Epoch – Central Allowance – 23%

2.7.7. The EA guidance states that the 2070s epoch should be used for development with a lifetime between 2061 and 2125 with the central allowance for up to 2100.

2.7.8. The contingency allowance for peak rainfall climate change that is applicable to this site is therefore as follows.

Peak Rainfall (Aire and Calder Management Catchment):

- 1% AEP Rainfall Event – 2070s Epoch – Central allowance 30%

2.8. EXISTING FLOOD RISK MANAGEMENT MEASURES

2.8.1. Lubrizol lies within the Syngenta Huddersfield Manufacturing Centre which operates and maintains the wider site's private drainage infrastructure and flood risk management measures. The wider site lies in flood zone 3 and Syngenta have implemented a number of active and passive mitigation measures over the years to make the site resilient to flooding.

2.8.2. Linked to this, Lubrizol have an established range of specific measures in place to manage flood risk:

Early Warning System

2.8.3. The early warning system is based on EA monitored river levels for the River Colne found at https://flood-warning-information.service.gov.uk/station/8105. The following key information is included in the Lubrizol Flood Procedures document:

- Station name: ICI Colne
- ICI Colne Datum = 50.98m AOD (this figure should be added to the EA river level)
- Typical Range / Level = 0.15m to 1.46m (+50.98m)
- Syngenta will raise an Initial Flood warning at 52.50m AOD (1.5m)
- Syngenta will initiate a Full Flood warning at 53.00m AOD (2.0m)
- Lubrizol will flood at 54.00m AOD (3.0m)

2.8.4. Lubrizol Huddersfield are signed up to the Environment Agency Flood Alert email system with Shift Leaders receiving updates directly.

Emergency Procedures

2.8.5. The levels above trigger actions to ensure critical infrastructure is protected, flood sensitive stored materials are protected or moved to safer locations, and staff are evacuated before the flood waters reach the affected areas.

2.8.6. The procedures have been developed by Lubrizol, in collaboration with Syngenta, drawing upon their experience of operating with this flood risk over many years and are continually reviewed and updated with lessons learned. Protocols from the Lubrizol Flood Procedures document (January 2024) will be applied to the proposed development and extracts are summarised in the table below. The full document has not been provided to avoid sharing sensitive commercial information.

Table 2-2 - Extract from Lubrizol Flood Procedures document (January 2024)

Initial Flood Warning at 52.50m (1.5m)	
Tasks	▪ Lift raw materials ▪ Lift Cardboard Kegs ▪ Check materials on compound are secure, tape empty drums together ▪ Lift finished goods, load onto trailer ▪ Check (chemical) storage, move all bags to top shelves (or 1st floor) ▪ Empty effluent sump ▪ Review current batches and ensure no new batches are started ▪ Elevate lab equipment ▪ Consult with office staff about electrical equipment ▪ Liaise with Syngenta staff (on radio) ▪ Ensure relevant flood defence barriers are fitted
Syngenta issue Full Flood Warning at 53.0m (2.0m)	
Tasks	▪ Ensure all non-essential staff & visitors are evacuated from site ▪ Move remaining cars to Syngenta external car park ▪ Power down plant ▪ Stop and depressurise packing lines ▪ Close plant doors ▪ Isolate electrical equipment ▪ Essential staff to move to a safe area and wait for further instructions via Syngenta
Flood Handover for Oncoming Shift	
Tasks	Ensure flood handover documentation is completed for oncoming shift with status of plant and details of flood information: ▪ time of initial flood warning ▪ time of full flood warning ▪ time the plant flooded ▪ highest flood level reached ▪ time Syngenta removed flood warnings
Flood Warning All Clear	
Notes	▪ Flooding will leave behind a lot of debris and contamination. It is important consideration is given to the potential hazards of the materials left behind. ▪ Floodwater can be contaminated with chemicals and sewage as a result of effluent drains overflowing. Contaminated floodwater can create risks to health. Protective clothing should be worn during the clean-up operation and other hygiene precautions should be taken. ▪ After the floodwater has subsided no attempt must be made to restart electric motors, which have been submerged. Before re-starting any of the processes the Process Engineer and Production Manager must be consulted

3. THE PROPOSED DEVELOPMENT

3.1. SUMMARY

3.1.1. The Proposed Development comprises the construction of a new canopy covered storage area and extended concrete yard for Lubrizol Ltd. The proposed development plan is included in **Appendix E**.

3.1.2. The Site is identified in an area of the Local Plan allocated as “Priority Employment Area” and does not fall within a Critical Drainage Area (CDA).

3.2. VULNERABILITY CLASSIFICATION

3.2.1. Considering the scale of the Site and based on Table 2 in the PPG, the Proposed Development will have uses which are classified as ‘less vulnerable’.

3.3. SEQUENTIAL AND EXCEPTION TESTS

3.3.1. As stated in the NPPF, a sequential risk-based approach to determine the suitability of land for development in flood risk areas should be applied at all stages of the planning process giving precedence to low flood risk areas wherever possible.

3.3.2. The wider site lies within Flood Zone 3 and the Proposed Development has been sited on an area of land which is slightly higher and at lower risk of flooding.

3.3.3. The Site is in Flood Zone 3a (**Figure 3-1)** and based on the NPPF flood risk vulnerability and flood zone compatibility table, Table 3 in the PPG, the development is considered appropriate and automatically meets the requirements of the sequential test.

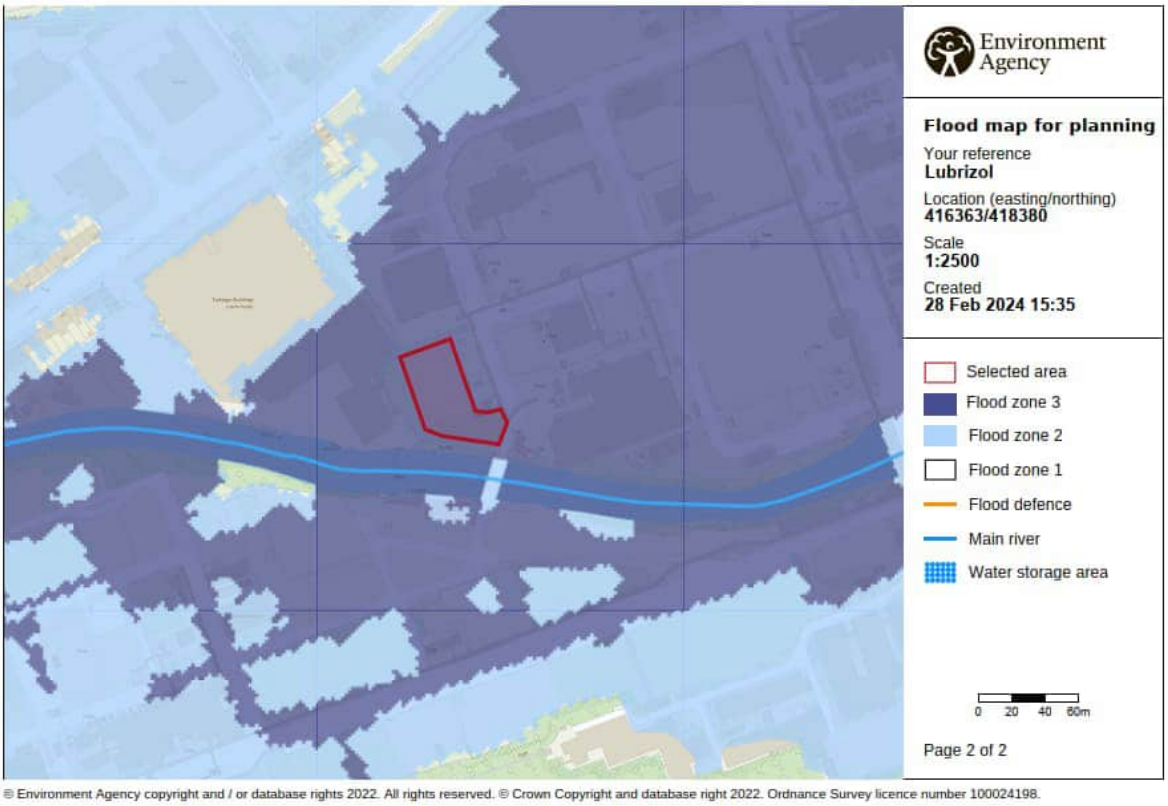


Figure 3-1 - Flood Map for Planning

4. FLOOD HAZARD

4.1. SOURCES AND MECHANISMS OF FLOODING

4.1.1. The potential risk of flooding to the Site from all current and future sources of flooding has been assessed in accordance with the National Planning Policy Framework.

4.1.2. **Table 4-1** below summarises the findings of the assessment. It should be noted that the designation of risk outlined in **Table 4-1** is prior to the inclusion of any further mitigation measures, which may subsequently act to reduce the risk.

4.1.3. A detailed explanation of the flood risk issues on the Site and determination of flood risk ratings are presented in Section 0 to 0.

Table 4-1 - Summary of degree of risk from each source of flooding

Source	Risk
Fluvial	High
Groundwater	Low to Medium
Sewer	Medium
Surface Water	Low
Other Sources	Low

4.1.4. Reference to Kirklees Council's SFRA, SWMP, LFRMS and the PFRA is made, where appropriate, in the following sections and relevant maps are included in **Appendix C**.

4.2. FLUVIAL FLOODING

4.2.1. Based on the online GOV.UK Flood Map for Planning and the River Flooding map of Kirklees LFRMS (**Appendix C**), the Site is located in Flood Zone 3a (high probability) where the probability of river flooding is greater than 1% (1 in 100 or greater chance) in any given year. Flood modelling results from the 2019 Colne Model were generated by the EA on 28 February 2024 (**Appendix C**) and are summarised in the figure and table below. Based on the central allowance for peak river flow specific to the site (**Section 2.7**), the climate change factor is 23%. The 2019 Colne Model does not include modelling for the 23% climate change therefore, the 1% AEP + 30% CC and 0.1% AEP + 20% CC scenarios have been used as a conservative proxy.

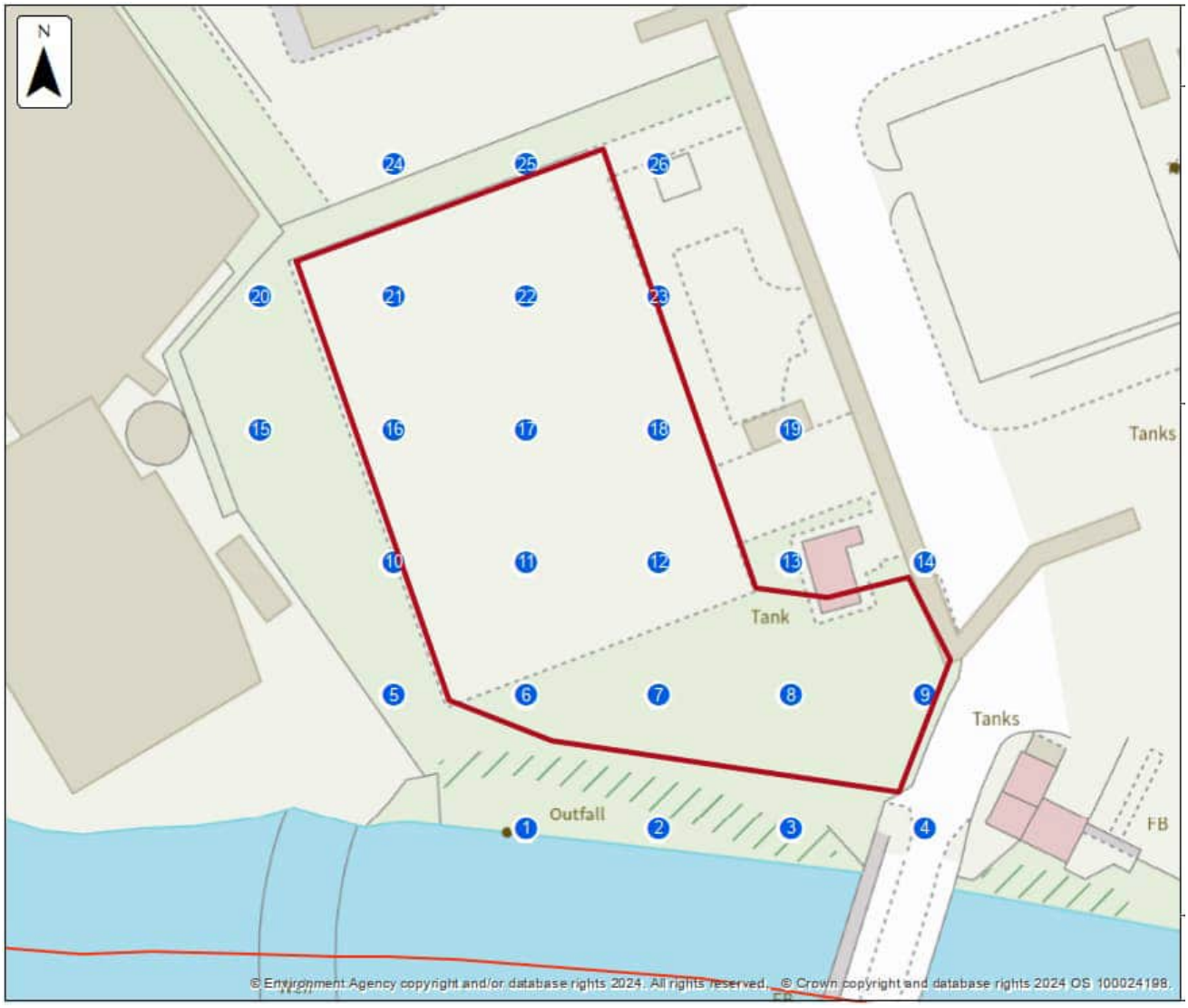


Figure 4-1 - 2019 Colne Model - node locations

Table 4-2 – Modelled Flood Depths

Flood Node	1% AEP (1 in 100) + 30% CC		0.1% AEP (1 in 1000) + 20% CC	
	Flood Depth (m)	Flood Height (m AOD)	Flood Depth (m)	Flood Height (m AOD)
6	0.34	55.02	0.64	55.32
7	0.40	55.06	0.65	55.32
8	0.31	55.02	0.59	55.30
9	0.67	55.03	0.99	55.34
10	0.51	55.05	0.83	55.37
11	0.67	55.05	0.99	55.37
12	0.77	55.04	1.09	55.36
16	0.64	55.04	0.95	55.36
17	0.71	55.04	1.03	55.36
18	0.78	55.03	1.10	55.35
21	0.69	55.04	1.00	55.36
22	0.76	55.03	1.09	55.36
23	0.90	55.03	1.23	55.35

Only nodes within the Site boundary have been listed.

AEP – Annual Exceedance Probability

4.2.2. The EA hydraulic model results identify flood depths of up to 1.10m within the site boundary.

4.2.3. Any construction within 8m of a main river will require permission from the EA but no works are proposed within this zone.

4.2.4. Based on the information available, the probability of fluvial flooding is assessed as **high**.

4.3. GROUNDWATER FLOODING

4.3.1. Groundwater flooding is caused by the emergence of water originating from underground.

4.3.2. The Environment Agency's national dataset, Areas Susceptible to Groundwater Flooding (AStGWF), is used to assess the future risk of groundwater flooding. The AStGWF map uses four susceptible categories to show the proportion of each 1km grid square where geological and hydrogeological conditions show that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring. From the AStGWF Map J of Kirklees SFRA (**Appendix C**) the risk of groundwater emergence is over 75%.

4.3.3. The Groundsure report showed a low risk of groundwater flooding for the whole site.

4.3.4. Based on the information available and the assessment undertaken, it is considered that the risk from groundwater flooding is **low to medium** as there are no records of groundwater flooding occurring on the Site.

4.4. SEWER AND DRAINAGE FLOODING

4.4.1. The risk of flooding to the site from overloaded sewers and surrounding drainage is dependent on the hydraulic capacity, operational / maintenance requirements and topography in relation to the site.

4.4.2. There are no Yorkshire Water public sewers within the vicinity of the site.

4.4.3. The wider Syngenta site is served by a private network of surface water and combined water drainage which is operated and well-maintained by Syngenta.

4.4.4. There are minor flood issues associated with capacity of the sewers and pumping station identified in the Syngenta FRA and the probability of sewer flooding impacting the Site is assessed as **medium**.

4.5. SURFACE WATER FLOODING

4.5.1. The online GOV.UK Long Term Flood Risk Map (**Figure 4-2**) corresponds with the updated Surface Water Flooding map from Kirklees LFRMS and the Flood Map for Surface Water (uFMfSW) Map J from Kirklees SFRA (**Appendix C**). The Proposed Development is generally in an area at very low risk (less than 0.1%) of surface water flooding. There is a small, localised area of low risk (between 0.1% and 1%) at the southeast corner of the Site and another north of the Site. These are associated with nearby existing bunded storage areas.

4.5.2. Based on the available information, the probability of surface water flooding is assessed as **low.**

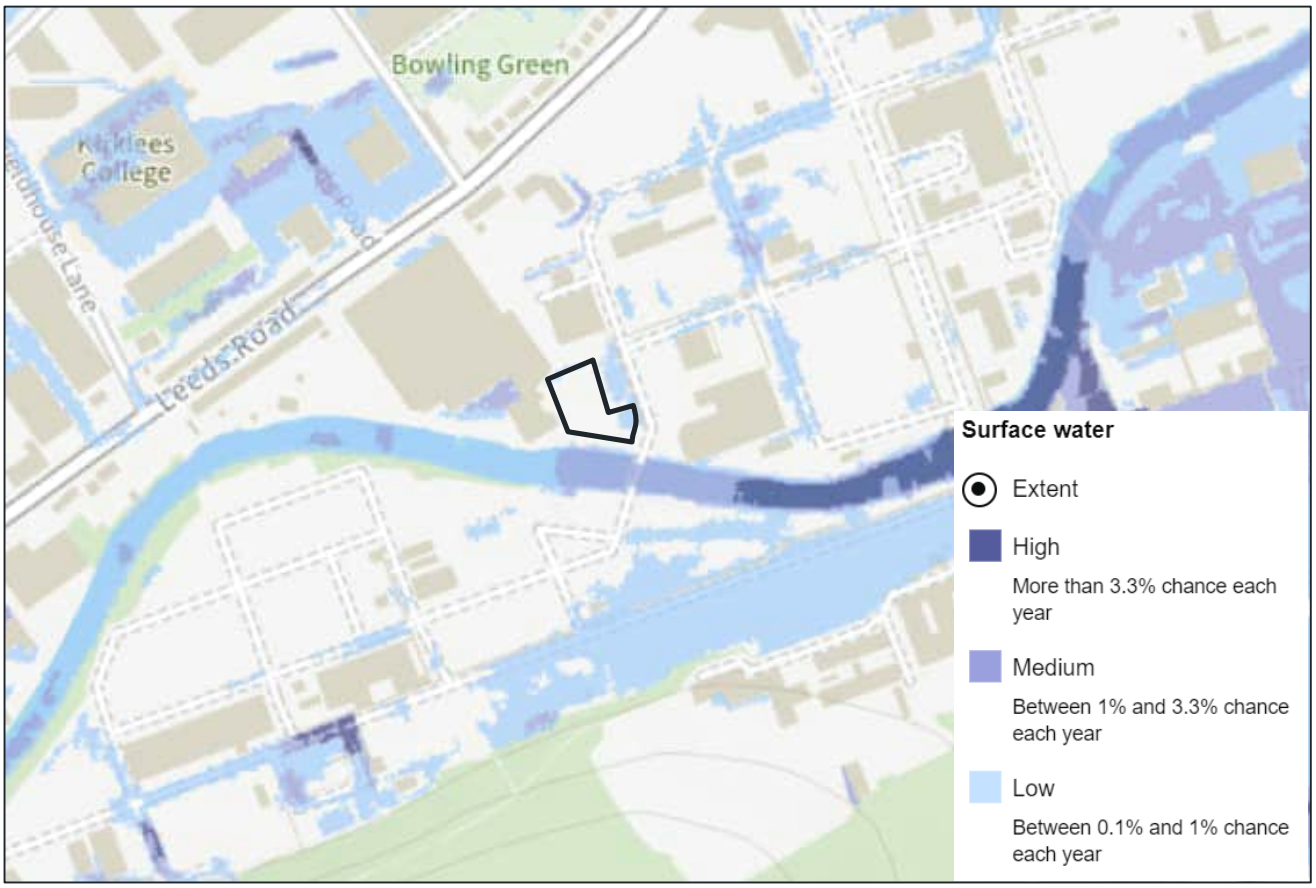


Figure 4-2 - Flood Risk from Surface Water Extract

4.6. FLOODING FROM OTHER SOURCES

4.6.1. Non-natural or artificial sources of flooding can include reservoirs, lakes, canals, bridges, etc. The potential effects of flood risk management infrastructure and other structures also needs to be considered.

4.6.2. According to the online GOV.UK's Long Term Flood Risk Map, the Site lies within the maximum extent of flooding from reservoirs (**Figure 4-3**). This mapping shows the largest area that might be flooded if a reservoir were to fail and release the water it holds.

4.6.3. The likelihood of reservoir flooding is much lower than other forms of flooding. The mapping displays the effects of catastrophic failure from reservoirs that hold at least 25,000m^3 of water and illustrate a worst-case scenario (i.e. consequence based) rather than a prediction of what will happen (i.e. risk based reflecting both consequence and hazard).

4.6.4. All the larger surrounding reservoirs are controlled, maintained and inspected by a regulated body in the form of either Yorkshire Water Services or the Canal & River Trust. Current reservoir regulation aims to make sure that all reservoirs are properly maintained and monitored in order to detect and repair any problem. These reservoirs are therefore not considered likely to provide a significant flood risk to the site.

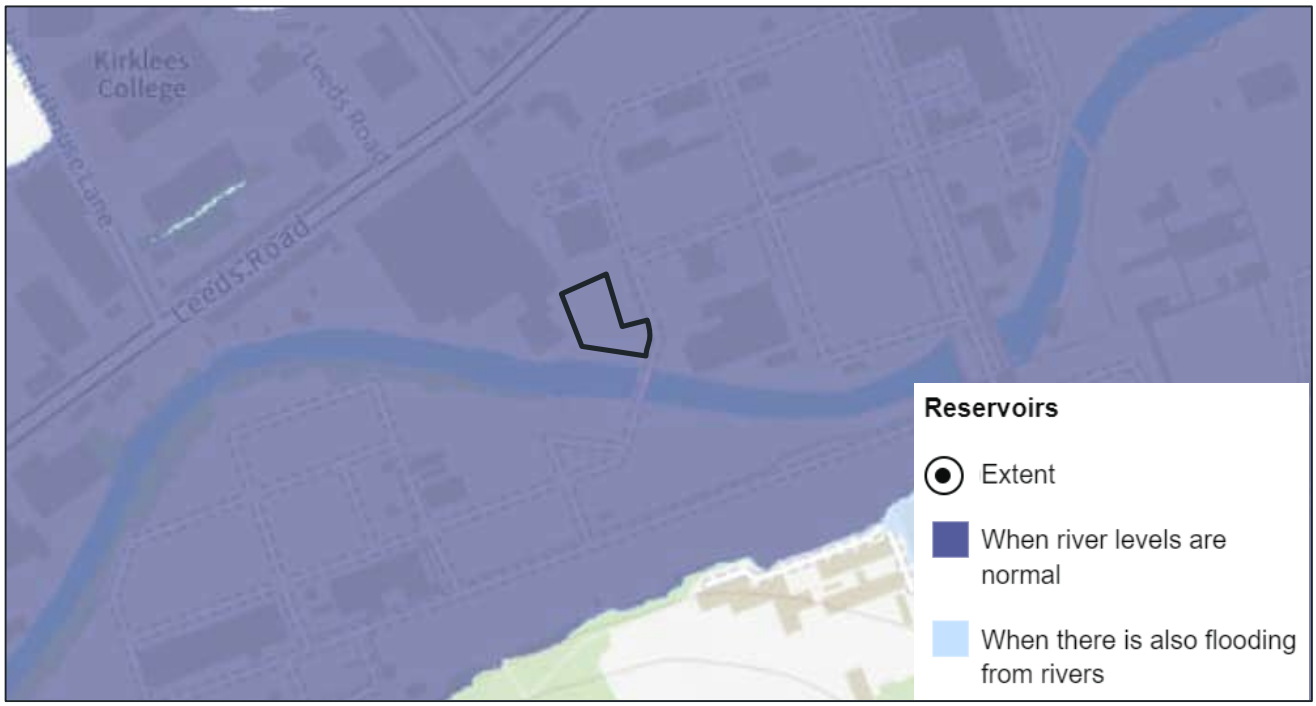


Figure 4-3 - Extent of Flooding from Reservoirs

4.6.5. The LFRMS Reservoir Flooding map also confirms the Site lies within the reservoir flood extents.

4.6.6. Other artificial sources of flooding which have the potential to cause flooding on the Site are culvert and structural blockages. The culverted sections of the EA main rivers, Lees Beck and Blackhouse Dike, and the foot and road bridges that cross the river have the potential to become blocked and cause the rivers to "back-up" and flood the Site.

4.6.7. Based on the available information, the probability of flooding from artificial sources can be assessed as **low.**

5. FLOOD RISK MANAGEMENT AND MITIGATION MEASURES

5.1.1. This section of the report details the flood risk mitigation measures required to manage the identified risk of flooding from different sources. As discussed in the previous sections, the main potential source of flooding identified that has a reasonable probability of affecting the Site, based on the information collected, is fluvial flooding.

5.1.2. The measures below include a range of design and management solutions including providing safe access and egress and implementing a drainage strategy in line with best practice.

5.2. EXISTING FLOOD RISK MITIGATION MEASURES

5.2.1. The wider site lies in flood zone 3 and already operates an established protocol to manage flood risk. Lubrizol has developed their own Flood Procedures document specific to their site detailing a number of flood risk measures which are outlined in section 2.7. It is proposed that these measures will be developed to extend to the Proposed Development.

5.2.2. The specific measures outlined below are based on current practice on the existing Lubrizol site and will also be adopted for the Proposed Development:

- The canopy covered storage area will have no walls or obstructions to allow free ventilation and free flood flow paths. Existing levels will be retained. The extended concrete yard will have a boundary of palisade fencing on a blockwork retaining wall set no higher than the adjacent existing site levels.
- Internal storage will be on pallets, similar to the existing external storage of the same products.
- Any worktops, fittings and power supply will be fixed at higher levels for the protection of the limited items needed for the management of the storage area.
- Robust flood procedures to mitigate the possibility of chemicals reaching the river are in place.

5.3. FLOOD RESILIENCE

5.3.1. Flood resistance, or dry proofing, stops water entering a building. Flood resilience, or wet proofing, accepts that water will enter the building but, through careful design, will minimise damage and allow the re-occupancy of the building quickly.

5.3.2. The Proposed Development is classed as less vulnerable and is proposed to be developed with flood resilience measures in place to allow water entry. The scheme where applicable will aim to comply with the Defra guidance on Improving the Flood Performance of New Buildings, so that the ground level, can quickly recover from flood events. The measures already in place at the existing Lubrizol site will be applied at the proposed covered storage area.

5.4. FLOOD COMPENSATION AND DISPLACEMENT

5.4.1. Raising finished floor levels, which is primarily a flood resistance measure applied to residential uses, would require levels to be raised to the design storm level (including climate change allowance) plus a freeboard allowance. In flood plain developments, this practice has the effect of displacing flood water which potentially causes more flooding in downstream locations.

5.4.2. To ensure the development does not increase the risk of flooding elsewhere, the proposed ground levels on site will not be altered with any land raising, this is to ensure flood waters will continue to convey as they currently do.

5.4.3. The Proposed Development comprises a canopy covered storage area with open sides ie no walls, to allow water to freely enter and leave the storage area. The extended concrete yard will have a boundary of palisade fencing on a blockwork retaining wall set no higher than the adjacent existing site levels.

5.4.4. The proposed ground level footprint will then have a negligible effect on displacement of flood water with no adverse effect on downstream flooding.

5.5. INTERNAL AND EXTERNAL EVACUATION PROCEDURES

5.5.1. As part of the site-specific flood measures in place, Lubrizol is already signed up to the EA flood warning service in order to be alerted when flooding on site may be possible. The Lubrizol Huddersfield Flood Procedures document identifies evacuation procedures and following the systems in place will ensure that occupants and managers on site can take the necessary actions to ensure people remain safe.

FLOOD HAZARD RATING

5.5.2. Flood Hazard describes the flood conditions in which people are likely to be swept over in a flood with the possibility of drowning and is a combination of flood depth, velocity and the presence of debris. Danger to people is assessed using flood hazard in accordance with the methodology and guidance set out by Defra (FD 2321/TR2 (2006)) and supplementary guidance note by the Environment Agency and HR Wallingford (May 2008). The following equation is used with categorisations in the table below:

HR = [d x (v + n)] + DF

where:-

HR = (flood) hazard rating

d = depth of flooding (m);

v = velocity of floodwaters (m/sec); and

DF = debris factor = 0.5 (conservative approach for urban environment)

n = a constant of 0.5

Table 5-1 - Hazard to People

Hazard Rating	Hazard Category	Description
<0.75	Low	Caution
0.75–1.25	Moderate	Dangerous for some (including children, the elderly and the infirm)
1.25–2.5	Significant	Dangerous for most people – includes the general public
>2.5	Extreme	Dangerous for all – includes the emergency services

Table 3.2 in FD2321/TR1

5.5.3. Based on the above and interpolated model values, the hazard rating at the site ranges from significant to extreme. However, with the established procedures in place, the risk is mitigated as all non-essential staff and visitors will be evacuated from site when a full flood warning is issued and essential staff are moved to a safe area.

5.6. SURFACE WATER DRAINAGE STRATEGY

5.6.1. It is essential for any new development that surface water is managed effectively to limit the risk off-site as well as on site.

5.6.2. Best practice for the management of surface water based on Building Regulations 2010 Part H states that surface water runoff from a site shall discharge to one of the following in order of priority:

- An adequate soakaway or some other adequate infiltration system;
- A watercourse; and
- Sewer.

5.6.3. The Lubrizol development falls within the wider Syngenta site which owns and maintains its drainage system privately. As such, the proposed development is considered non-standard as it does not discharge surface water runoff directly to the water environment or public sewers, discharge is instead via a private drainage system. Notwithstanding this, the drainage strategy still aims to achieve compliance with the Non-statutory technical standards for sustainable drainage systems and other guidance documents where possible.

Existing Surface Water Discharge Regime

5.6.4. The existing drainage strategy includes connections from the existing concrete hardstanding area to the wider Syngenta drainage network using the existing sump tank for runoff from ground level. When the tank reaches a certain level, a sample is taken and the water is pumped to the Syngenta effluent drain. The Syngenta sewers are routed to an on-site effluent treatment plant which ultimately discharges at an agreed rate to the public sewers under a Yorkshire Water discharge consent managed and held by Syngenta.

5.6.5. The existing concrete impermeable area has been measured on the drainage catchment area plan (**Appendix E**) and totals 1,680m^2. Applying the modified rational method with a 50mm/h rainfall intensity, the existing brownfield flow rate is calculated as 23.4 l/s. Allowing a 30% reduction for previously developed sites, the allowable discharge rate would be 16.3 l/s.

Proposed Surface Water Discharge Regime

5.6.6. The RGS Phase 2 Geo-environmental Investigation report did not include infiltration tests but did register groundwater levels between 2.4m and 3.0m below ground level. The ground investigation also found a capping of granular made ground present across the site with a maximum thickness of 1.2m. The Phase 1 Environmental Desk Study states that there are records of historical industrial land uses and the Site is within a coal mining area. Kirklees Council Flood Risk team have confirmed that due to its proximity to the watercourse and BGS rating of level 4 (severe constraints for infiltration), it is therefore considered unlikely that discharge via infiltration will be suitable for the Site.

5.6.7. Due to the treatment process required and location of the effluent treatment plant and sitewide attenuation storage, a separate direct discharge to the river is not feasible and runoff will discharge to the existing site sewers.

5.6.8. Following the arrangements in place between Lubrizol and Syngenta, the site surface water drainage is split into two catchments. In the first catchment, runoff from the canopy roof discharges directly to the Syngenta drainage at an unrestricted rate. The new canopy roof area measures 1,680m^2 on the drainage catchment area plan (**Appendix E**). Attenuation storage is provided at the main Syngenta site effluent treatment plant and therefore is not provided within the site boundary. The second catchment comprises the service yard storage areas where runoff is directed to the sump and pumped to the sitewide Syngenta sewers. The new service yard area measures 670m^2 on the drainage catchment area plan (**Appendix E**).

5.6.9. A proposed drainage layout for the site is included in **Appendix E** showing the proposed drainage routes and connection points.

5.6.10. The surface water drainage strategy is prepared in outline only to demonstrate the proposed development can meet national and local requirements, i.e. in a sustainable manner without increasing the risk of flooding to neighbouring properties for events up to and including the 1 in 100 year storm plus climate change.

Water Quality

5.6.11. Sustainable drainage design must ensure that the quality of any receiving water body is not adversely affected and preferably enhanced before it leaves the site. The proposed drainage scheme has the potential to introduce contaminants to the water environment and Lubrizol have systems in place within their existing operations to ensure that this risk is minimised.

5.6.12. All runoff from storage areas must be directed to the existing sump where it is stored, sampled and then pumped to the Syngenta Effluent Treatment Plant. The Syngenta treatment operation falls under a Yorkshire Water discharge consent with strict measures in place to control discharges to the existing sewer system.

5.6.13. Runoff from the new canopy roof area is collected and conveyed in a closed system and is considered clean with very low pollution hazard levels.

Operation and Maintenance

5.6.14. The new surface water drainage network will be maintained privately and will be designed to be operated and maintained for the lifetime of the development with appropriate access available and management systems in place. Lubrizol already has systems in place for the maintenance of the existing drainage on site. As part of the maintenance regime, the system will be regularly inspected and cleared out to reduce the risk of blockages.

Overland Flow & Management of Residual Risk

5.6.15. Extreme Storm Event - as well as managing the surface water generated by the development, any overland flow routes need to be managed within the scheme proposals. The risk of surface water flooding to the site associated with the exceedance of the capacity of the drainage system during an extreme event in excess for which the drainage system was designed can be managed through the following:

- Engineering site levels to ensure flow is directed away from buildings and towards less vulnerable receptors; and
- Construction of a suitably designed drainage system with adequate capacity and storage volume to manage the site surface water runoff.

5.6.16. For storm events in excess of the worst case design storm, exceedance flows will be managed at ground level, directed locally to the adjacent road. A Flood Routing Plan included in **Appendix E** shows the exceedance routes for runoff in extreme events.

5.6.17. Drainage System Failure - there is a risk associated with blockage or operational failure of the drainage system which could cause flooding. This could include blockage of pipes and/or obstruction of flow control devices and outfalls. This risk can be reduced through ensuring that the drainage system are adequately maintained to ensure the drainage system remains serviceable and will be assured by constructing the system to correct standards. Maintenance tasks include periodic inspection of outfalls and manholes to ensure inlet and outlets do not become clogged.

5.7. OFFSITE EFFECTS

PRIVATE DRAINAGE NETWORK

5.7.1. Lubrizol have confirmed that the private drainage networks will be able to accommodate the proposed flows for both foul and surface water discharge from the Proposed Development.

FLUVIAL EFFECT

5.7.2. The development will not cause effects elsewhere in terms of fluvial flood risk due to its flood resilient construction.

5.7.3. Any local detrimental impact would only affect the existing Lubrizol manufacturing plant located downstream of the Proposed Development.

6. CONCLUSIONS

6.1.1. This FRA and ODS has been prepared on behalf of Lubrizol Ltd to support the planning application for the construction of a canopy covered storage area and associated storage yard .

6.1.2. The Kirklees Council SFRA and the online GOV.UK Flood Map for Planning identify that the Site is located in Flood Zone 3a where the probability of river or sea flooding is greater than 1% (1 in 100) chance in any given year. The probability of fluvial flooding can therefore be assessed as high.

6.1.3. Other potential sources of flooding have been investigated and the flood risk to the site is summarised in the table below:

Table 6-1 - Summary of degree of risk from each source of flooding

Source	Risk
Fluvial	High
Groundwater	Low to Medium
Sewer	Medium
Surface Water	Low
Other Sources	Low

6.1.4. Based on the high risk of fluvial flooding, Lubrizol have selected a site use which is resilient to flooding; flooding will not lead to contamination of the River Colne, staff and visitors accessing the site will be safe and production is not unduly disrupted by flooding.

6.1.5. The provision of flood defences to exclude flood water from the River Colne from entering the site is not an option due to the consequential increase in risk of flooding off-site. Therefore, Lubrizol have adopted the existing site strategy established across the wider site to manage the on-site flood risk which ensures the site is resilient to flooding and includes the following measures:

- An early warning system to provide sufficient notice of flooding to take appropriate action.
- Identification of the level of risk in areas of the site.
- Established emergency procedures to protect vulnerable infrastructure and materials from damage or causing contamination.
- Relocation of vulnerable infrastructure and materials out of flood zones if practicable.
- Ensuring the evacuation and safe access/egress of staff and visitors to the site.
- Flood resilience in the form of raised infrastructure above the highest flood level and flood resilient forms of construction.

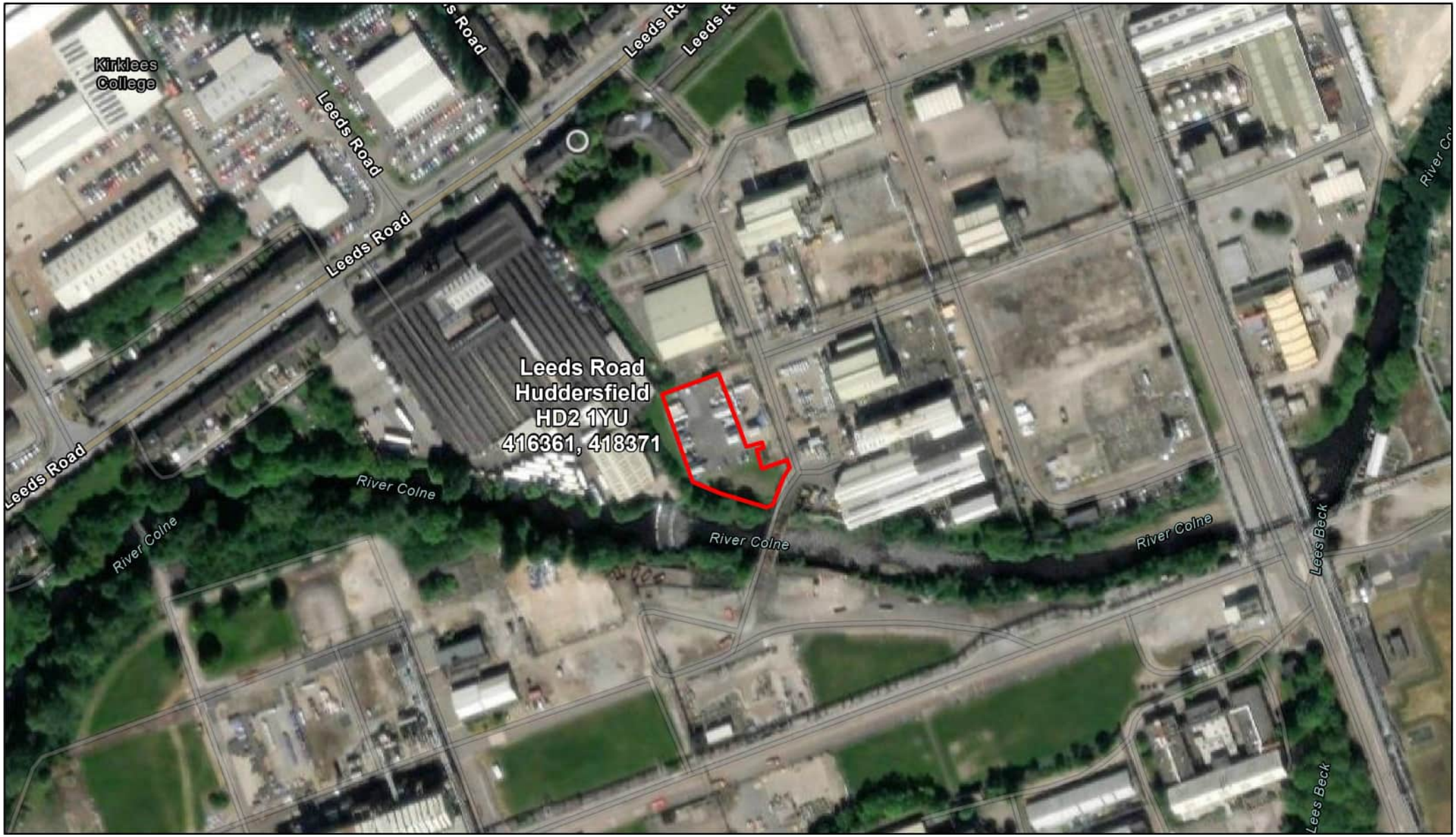
6.1.6. Surface Water could in theory be a source of flood risk due to the increase in impermeable area. This however will be mitigated by the design of a drainage strategy which demonstrates the ability to accommodate surface water runoff within the site and to prevent potential exceedance flows off-site.

6.1.7. Incorporating these measures in the proposals will ensure that the facility is suitably resilient to flooding with no off-site impacts.

Appendix A

SITE LOCATION PLAN

Lubrizol Site Location Plan



11/6/2024

1:4,500

0 0.02 0.04 0.09 mi

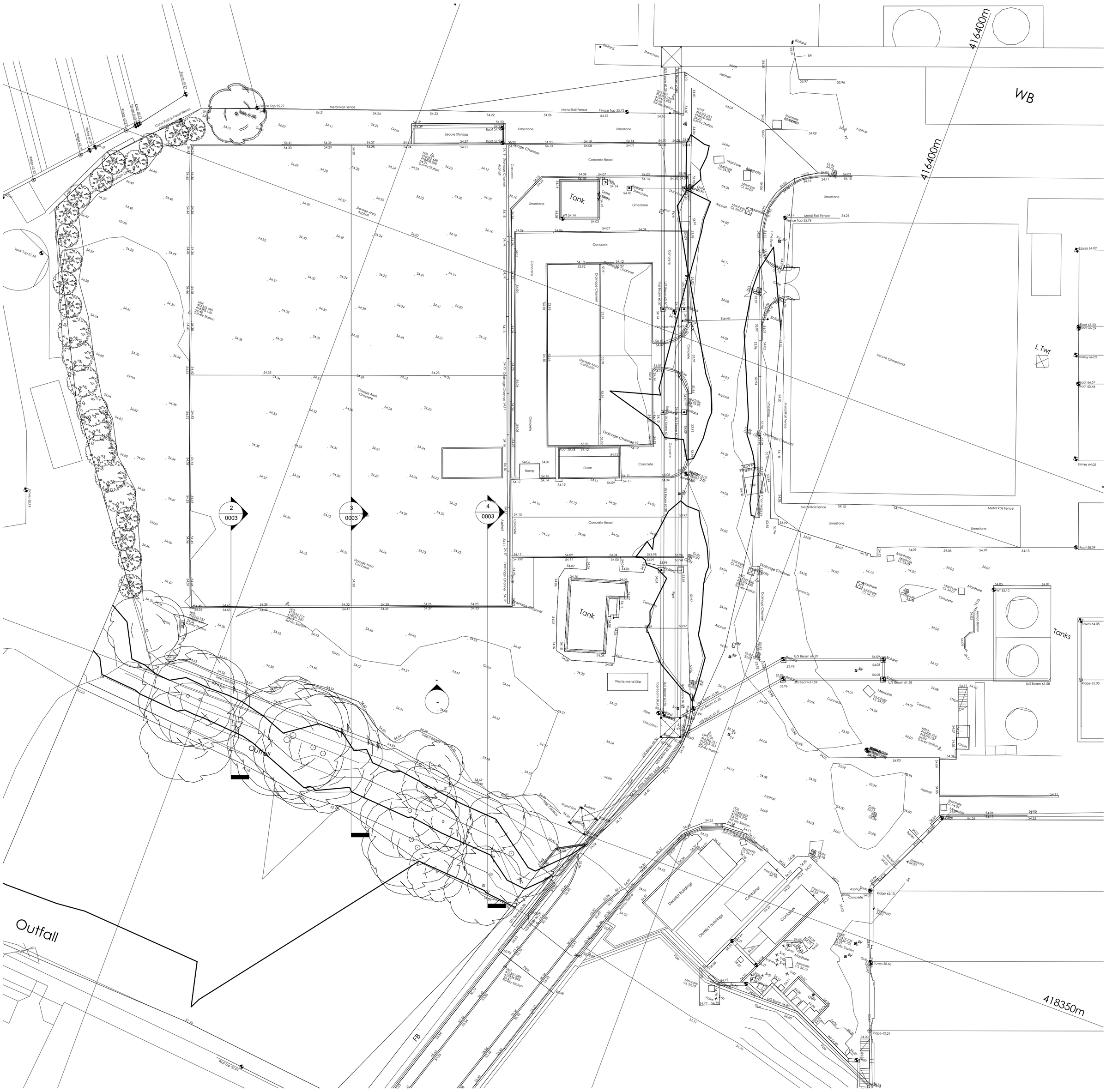
0 0.04 0.07 0.14 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

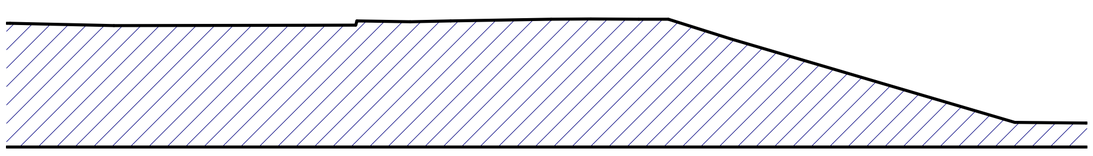
Appendix B

TOPOGRAPHICAL SURVEY

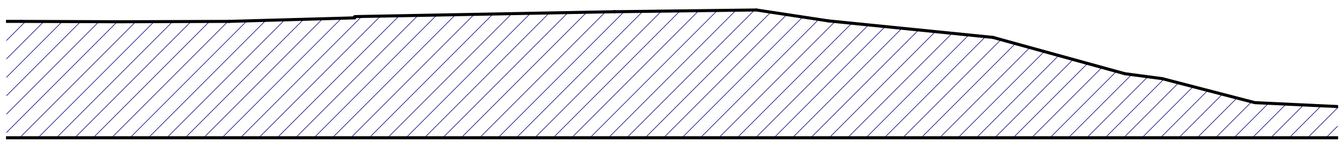
A1



Existing Site Plan
1 : 200



Section 1
1 : 100



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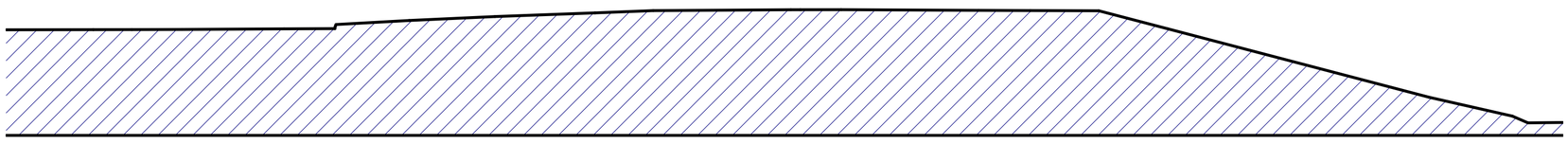
1 : 100



Section 3
1 : 100

Rev	Description	Drawn	Checked	Date
P2	Revised to suit client comments	MJR		29-10-24
P1	FIRST DRAFT	MJR		14-10-24

Document Status : **S2**

Purpose of Issue: **FOR DISCUSSION**

MARTIN WALSH ARCHITECTURAL

Firth Buildings, 99 - 103 Leeds Rd, Dewsbury, WF12 7BU t: 01924 464342
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Project
Proposed canopy and extend existing yard
Lubrizol Limited, Syngenta, Leeds Road, Huddersfield, HD2 1YU

Title
Existing Site Plan

Client
Lubrizol Limited

MWA Project Ref	Scale	Original Paper Size	Paper Orientation	Drawn
6640	As indicated	@A1	Portrait	MJR

File Identifier

Project	Originator	Volume	Level	Type	Role	Number	Revision
LULR -	MWA -	XX -	XX -	DR -	A -	0003	P2

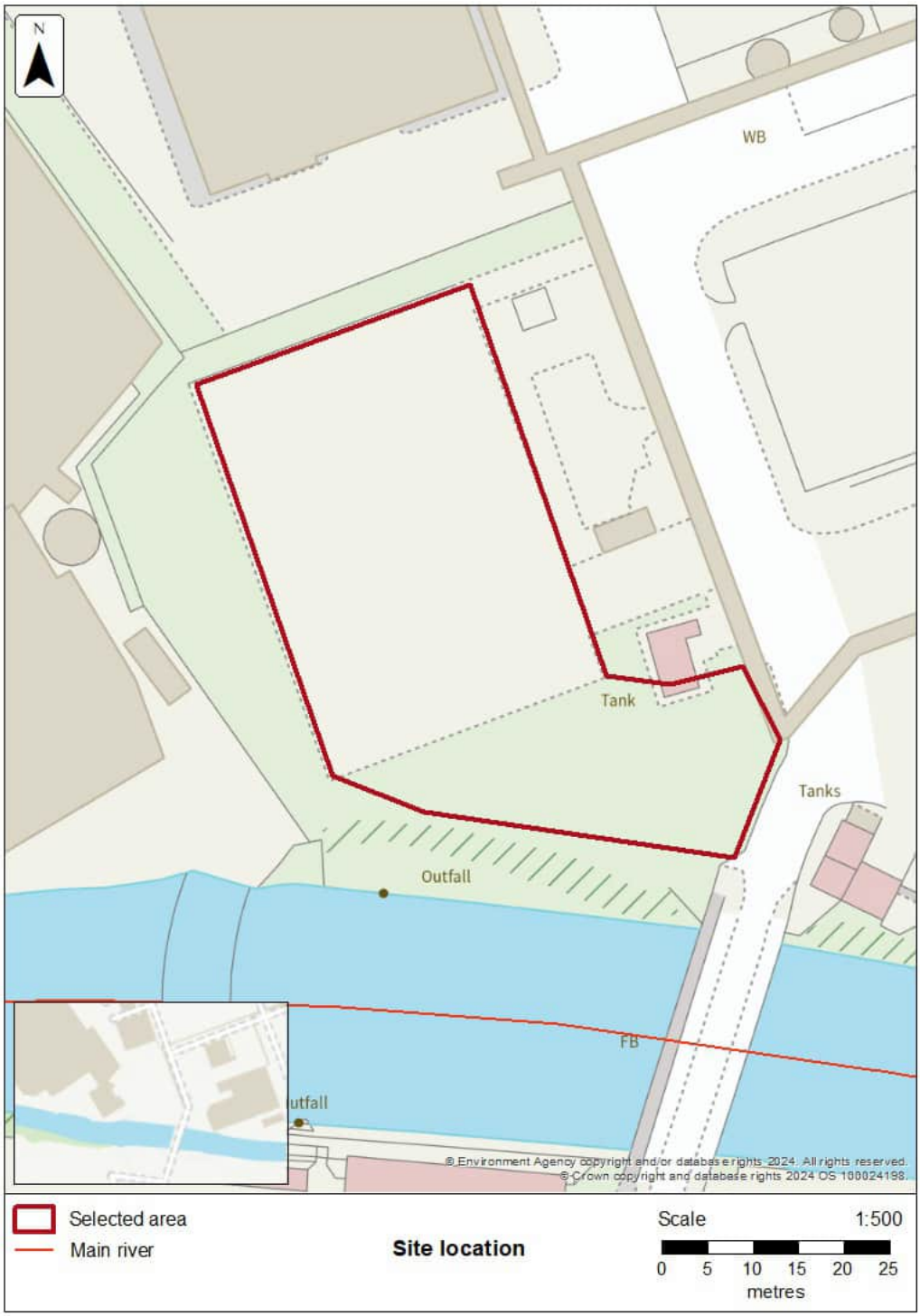
Appendix C

ENVIRONMENT AGENCY PRODUCT 4 DATA AND RELEVANT MAPS

Flood risk assessment data

Location of site: 416359 / 418377 (shown as easting and northing coordinates)
Document created on: 28 February 2024
This information was previously known as a product 4.
Customer reference number: MW54X4FGBBBE

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



How to use this information

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

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

Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- historic flooding
- flood defences and attributes
- information to help you assess if there is a reduced flood risk from rivers and the sea because of defences
- modelled data
- climate change modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Surface water and other sources of flooding

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

- surface water
- ordinary watercourses
- reservoirs

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

About the models used

Model name: 2007 Fenay Beck
Scenario(s): Defences removed fluvial, defences removed climate change fluvial
Date: 1 August 2007

Model name: 2011 Huddersfield Study - Allison Dike and Blackhouse Dike
Scenario(s): No defences exist fluvial, no defences exist climate change fluvial
Date: 31 March 2011

Model name: 2019 Colne Model
Scenario(s): Defended fluvial, defences removed fluvial, defences removed climate change fluvial
Date: 1 August 2019

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

Terminology used

Annual exceedance probability (AEP)

This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occuring in any one year, is described as 1% AEP.

Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

Flood map for planning (rivers and the sea)

Your selected location is in flood zone 3.

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

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

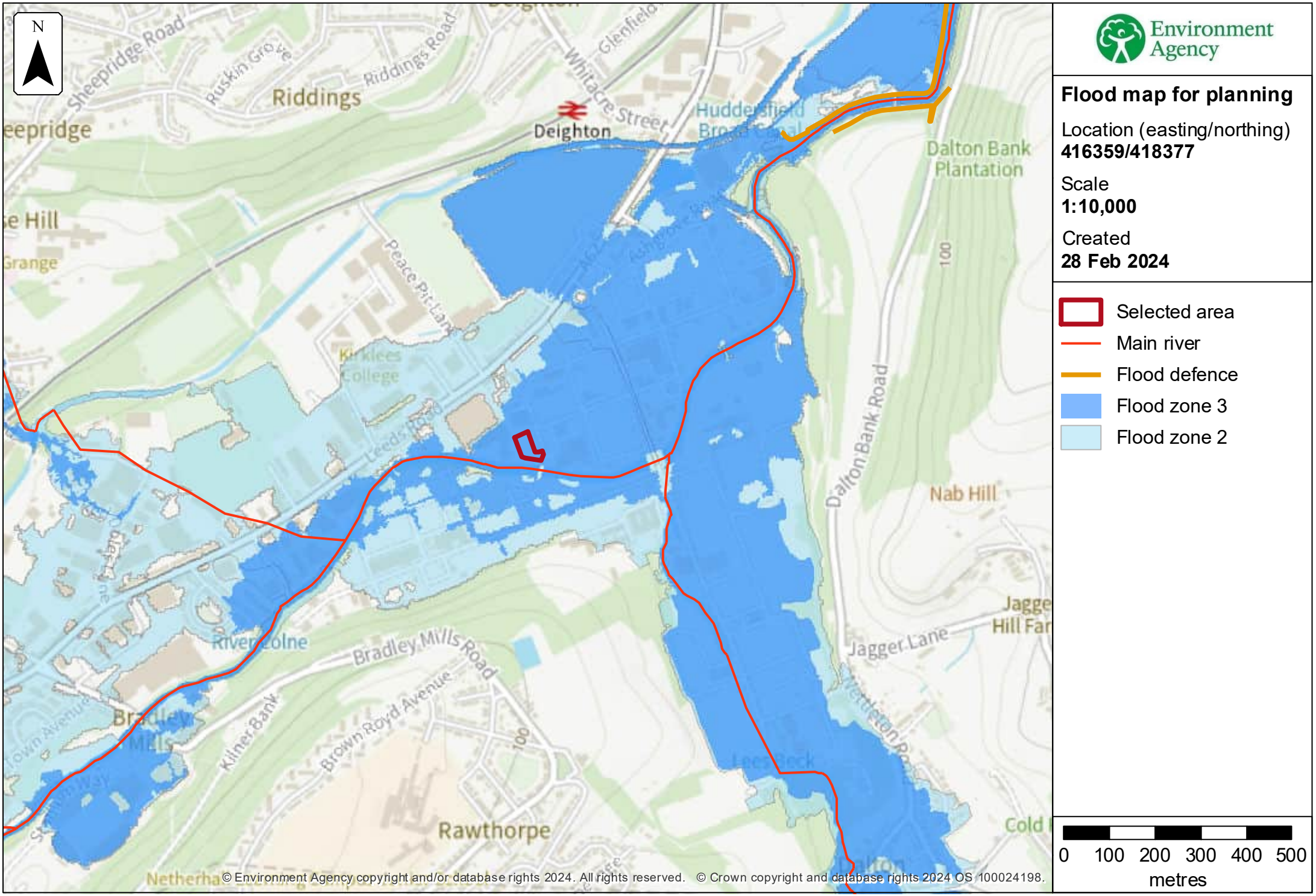
Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

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

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

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

The flood zones are not currently being updated. The last update was in November 2023. Some of the flood zones may have changed, however all source data is included in the models below.



Environment Agency

Flood map for planning

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

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

0 100 200 300 400 500
metres

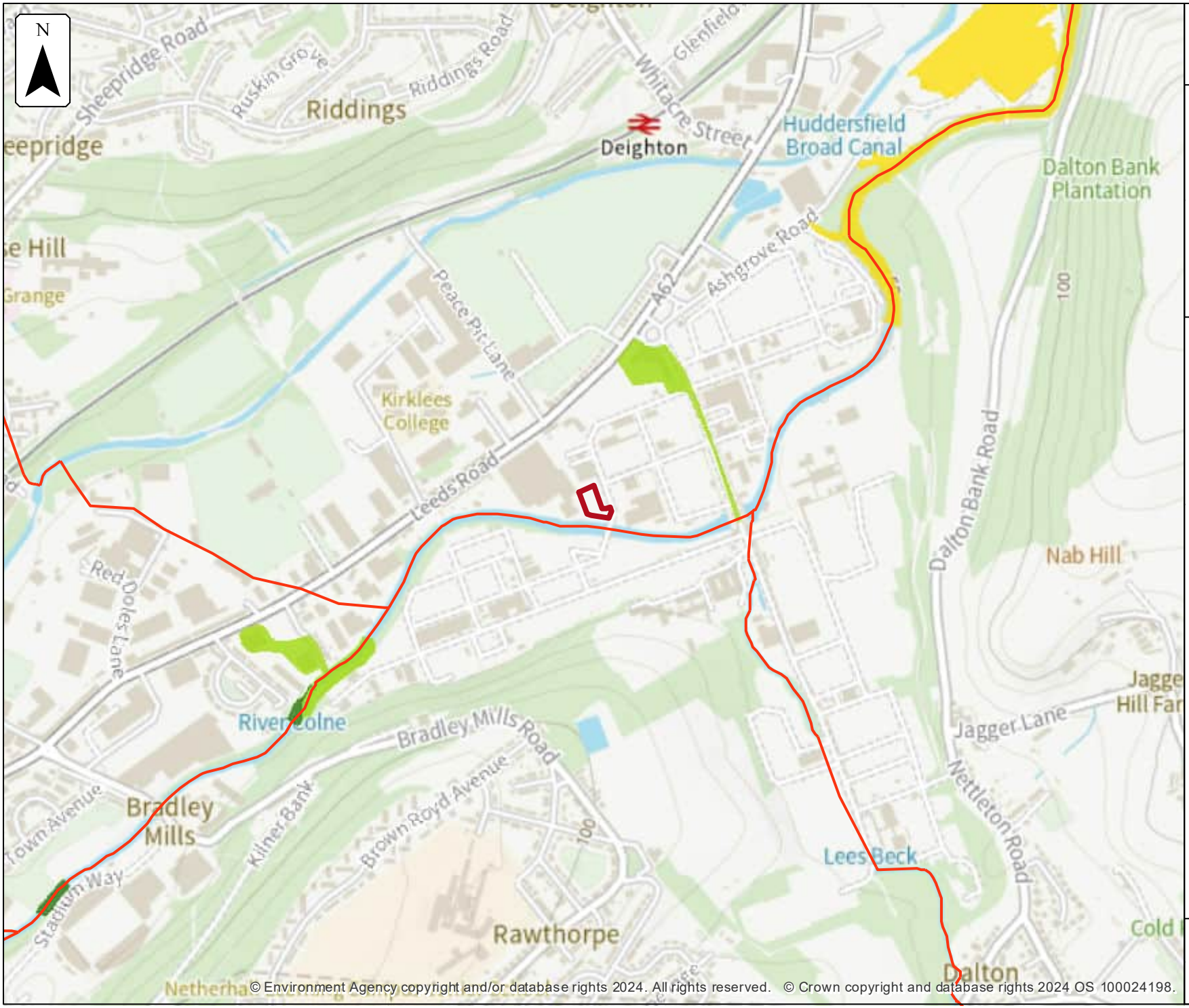
Historic flooding

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

- our records are incomplete, so the information here is based on the best available data
- it is possible not all properties within this area will have flooded
- other flooding may have occurred that we do not have records for
- flooding can come from a range of different sources - we can only supply flood risk data relating to flooding from rivers or the sea

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

Download recorded flood outlines in GIS format



Environment Agency

Historic flood map

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

- Selected area
- Main river

Date of flood event

- February, 2022
- February, 2020
- December, 2015

0 100 200 300 400 500
metres

Historic flood event data

Start date	End date	Source of flood	Cause of flood	Affects location
20 February 2022	28 March 2022	main river	channel capacity exceeded (no raised defences)	No
15 February 2020	19 March 2020	main river	channel capacity exceeded (no raised defences)	No
25 December 2015	29 December 2015	main river	channel capacity exceeded (no raised defences)	No

Flood defences and attributes

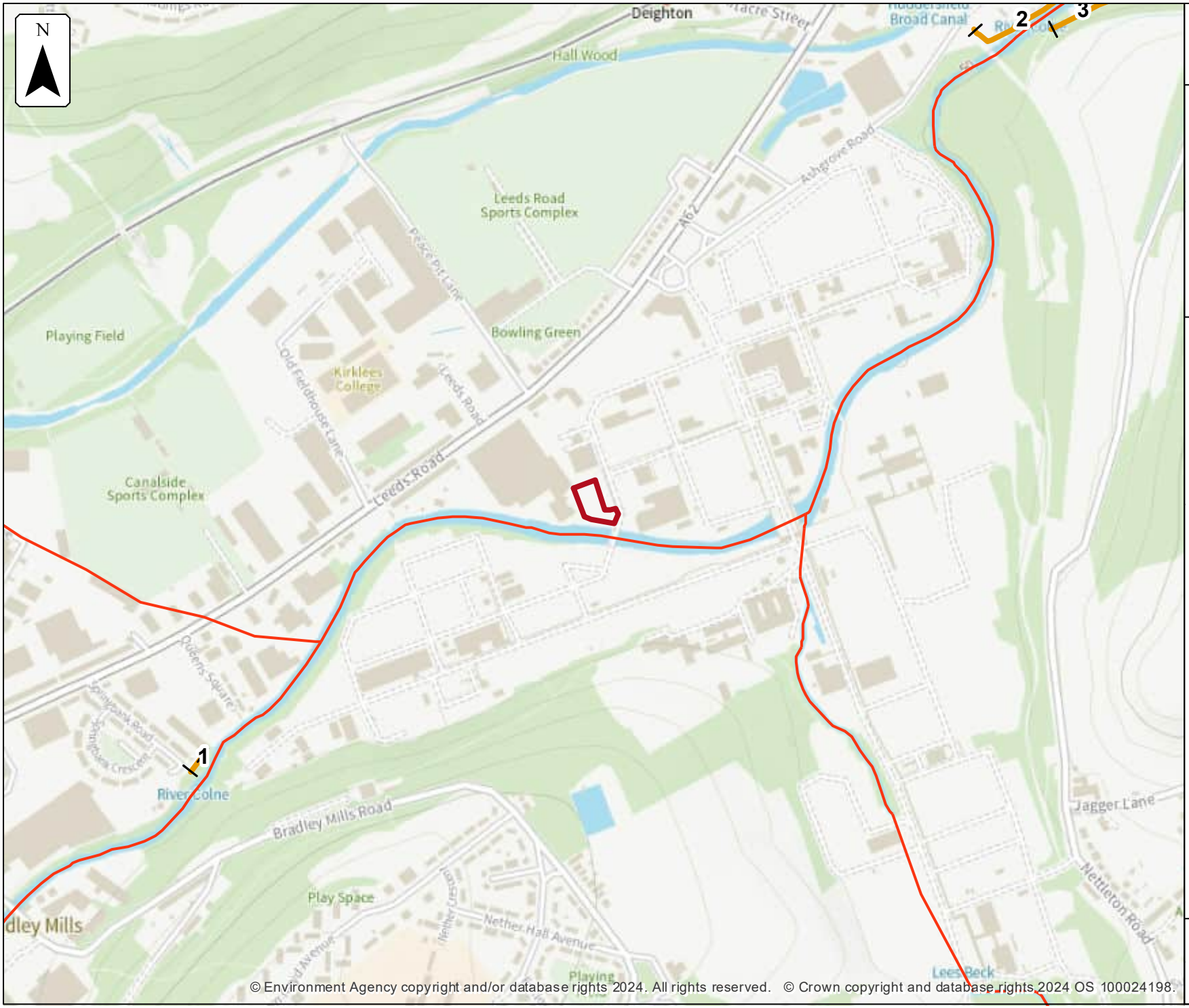
The flood defences map shows the location of the flood defences present.

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

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

Use this information:

- to help you assess if there is a reduced flood risk for this location because of defences
- with any information in the modelled data section to find out the impact of defences on flood risk



Environment Agency

Flood defences

Location (easting/northing)
416359/418377

Scale
1:7,500

Created
28 Feb 2024

- Selected area
- Main river
- Flood defence

0 100 200 300
metres

Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	183943	Wall		Good	56.97	57.34	
2	74426	Wall	20		53.47	57.79	
3	27546	Wall	20		60.97	56.13	

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

Modelled data

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

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

Climate change

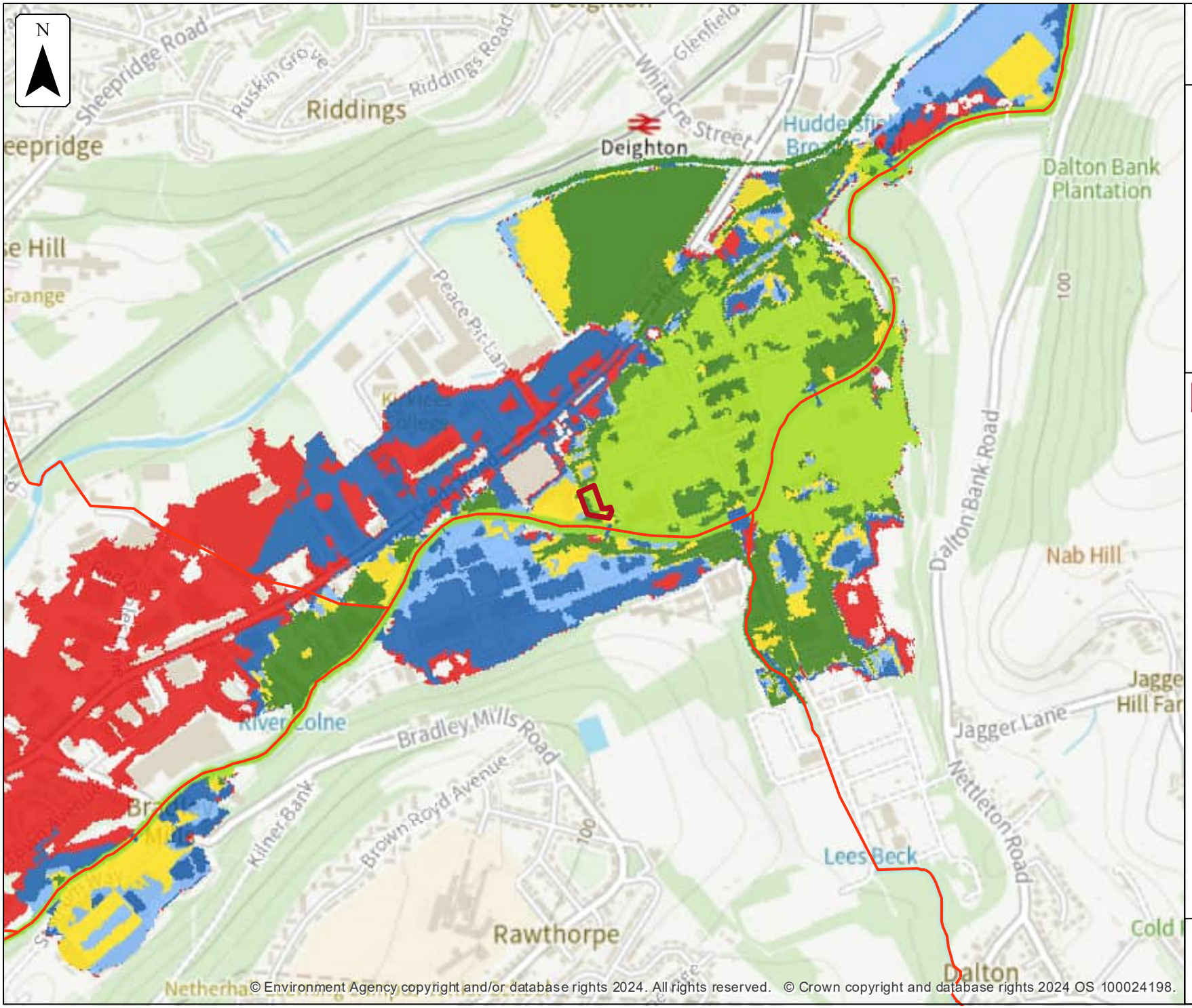
The climate change data included in the models may not include the latest flood risk assessment climate change allowances. Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

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

Modelled scenarios

The following scenarios are included:

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



Environment Agency

Defended modelled fluvial extent

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

Model name
2019 Colne Model

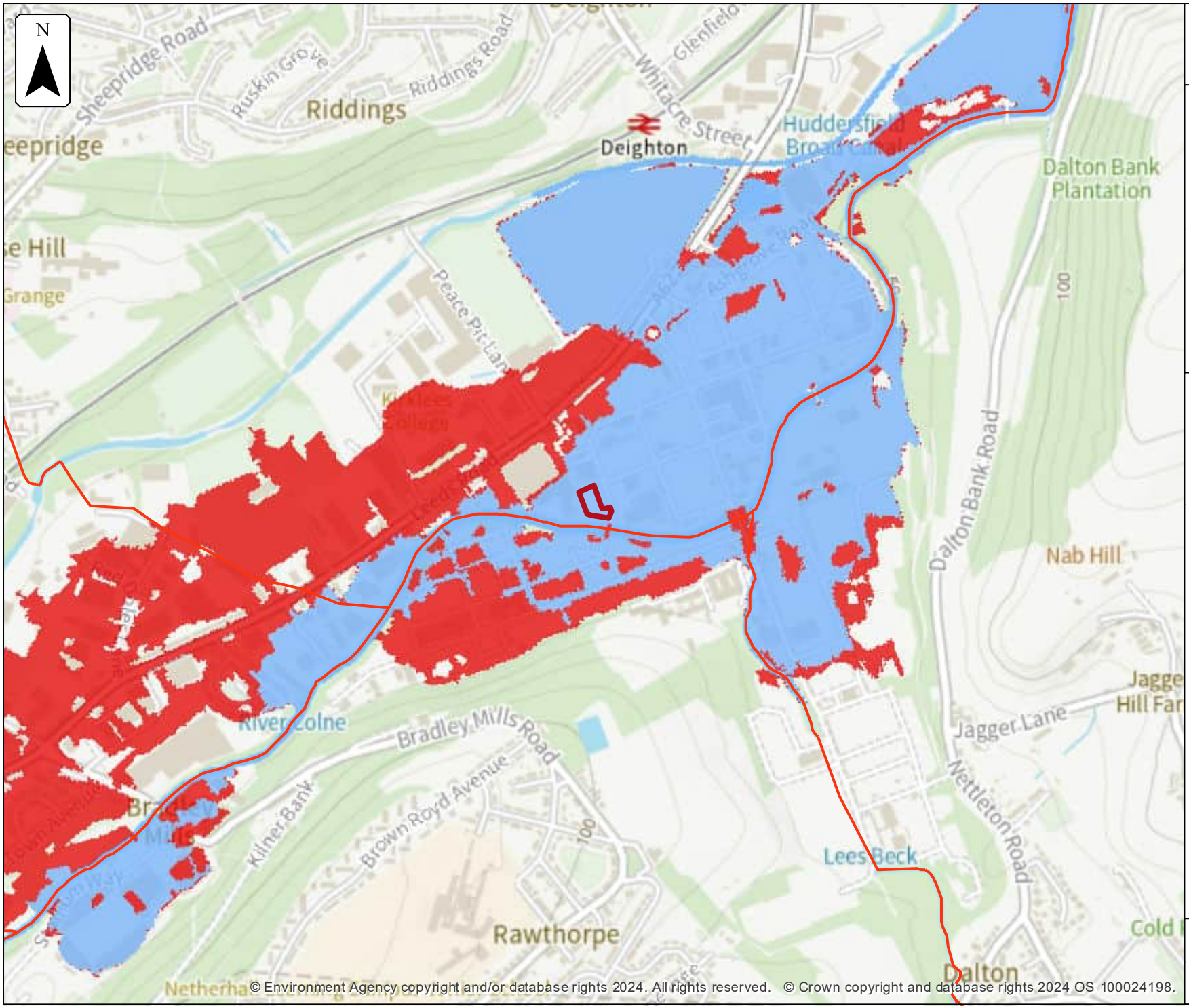
- Selected area
- Main river

Modelled flood extent

- 5% AEP
- 2% AEP
- 1.33% AEP
- 1% AEP
- 0.5% AEP
- 0.1% AEP

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

0 100 200 300 400 500
metres



Environment Agency

Defences removed modelled fluvial extent

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

Model name
2019 Colne Model

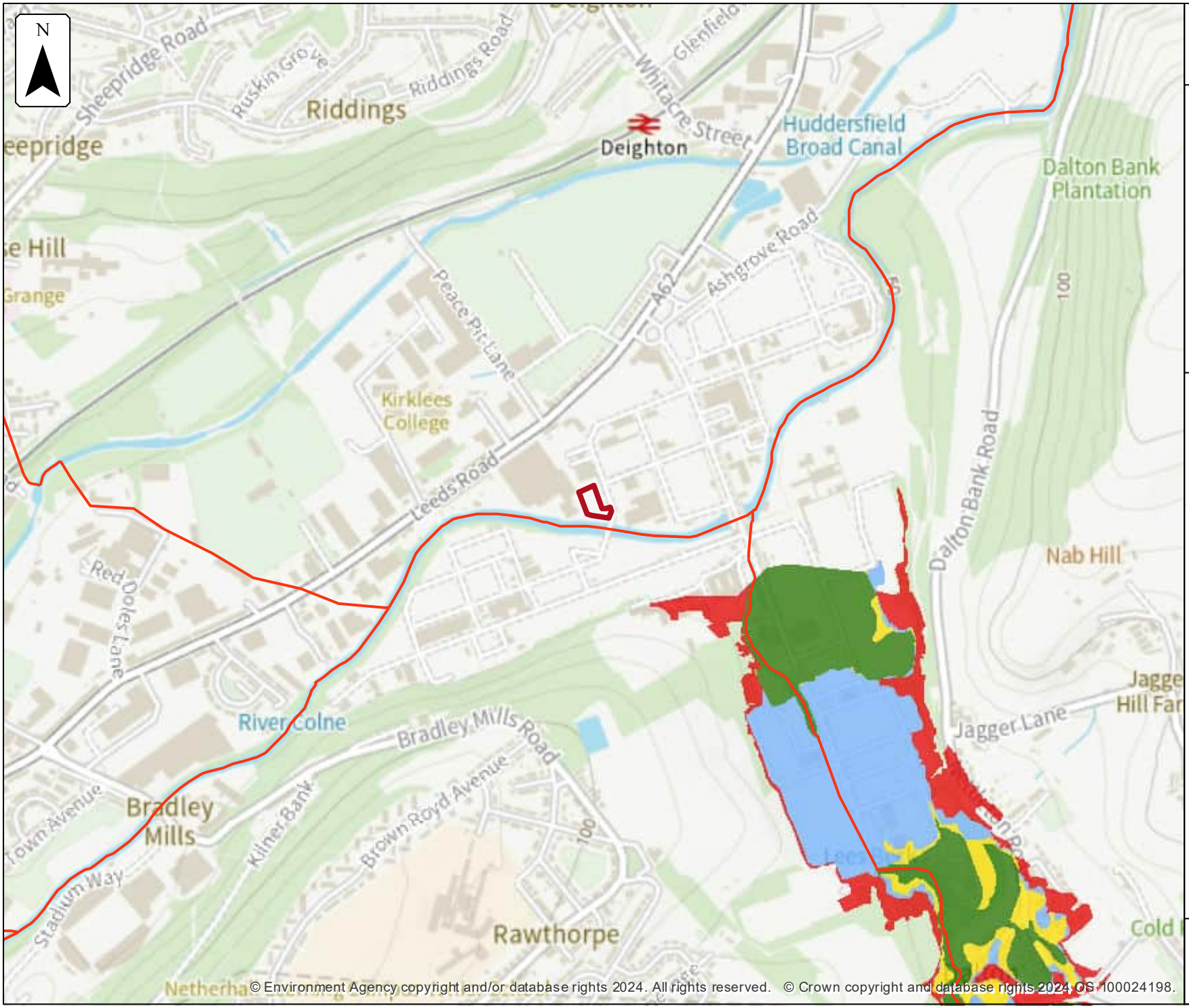
- Selected area
- Main river

Modelled flood extent

- 1% AEP
- 0.1% AEP

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

0 100 200 300 400 500
metres



Environment Agency

Defences removed modelled fluvial extent

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

Model name
2007 Fenay Beck

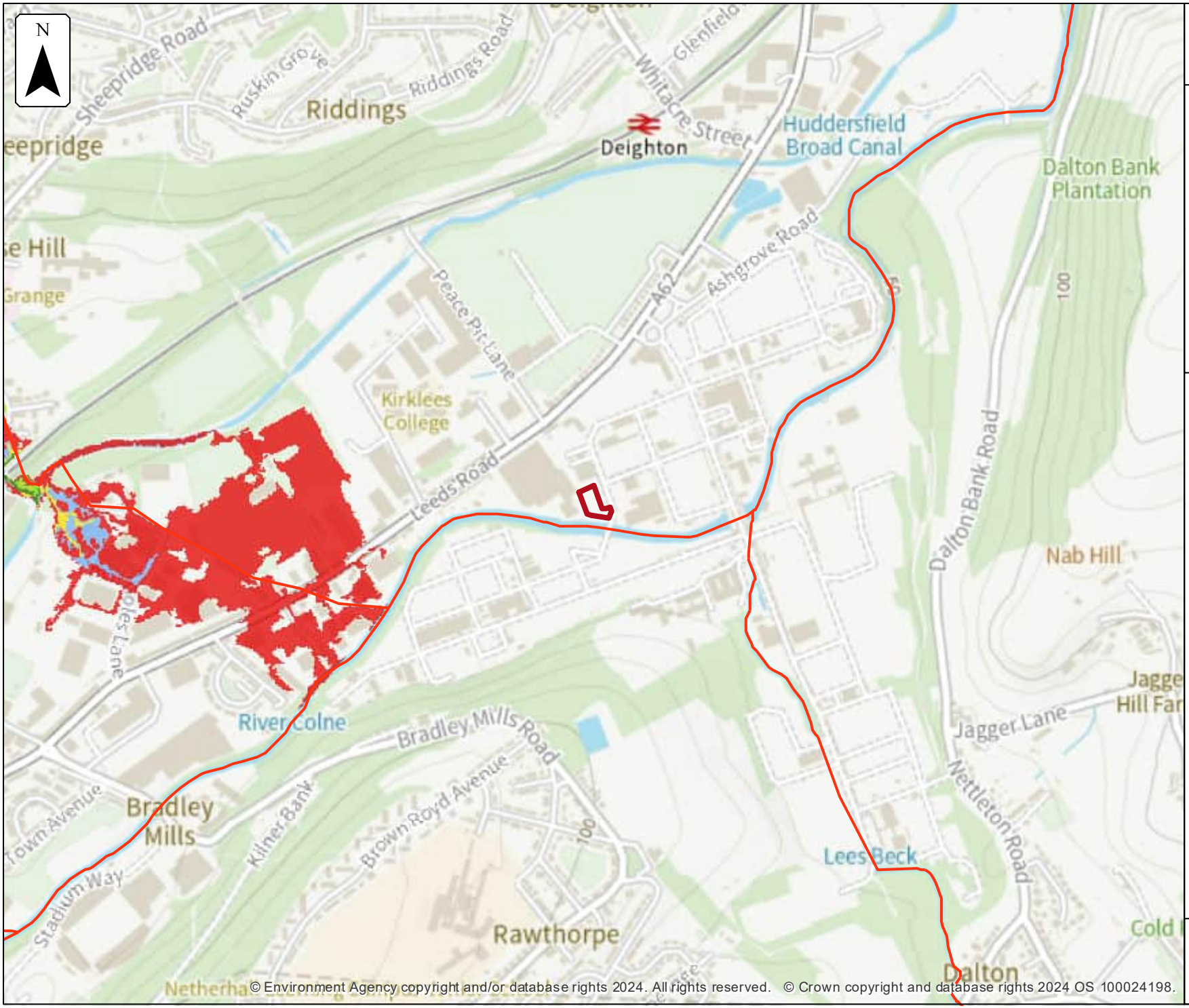
- Selected area
- Main river

Modelled flood extent

- 2% AEP
- 1.33% AEP
- 1% AEP
- 0.1% AEP

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

0 100 200 300 400 500
metres



Environment Agency

No defences exist modelled fluvial extent

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

Model name
2011 Huddersfield Study - Allison Dike

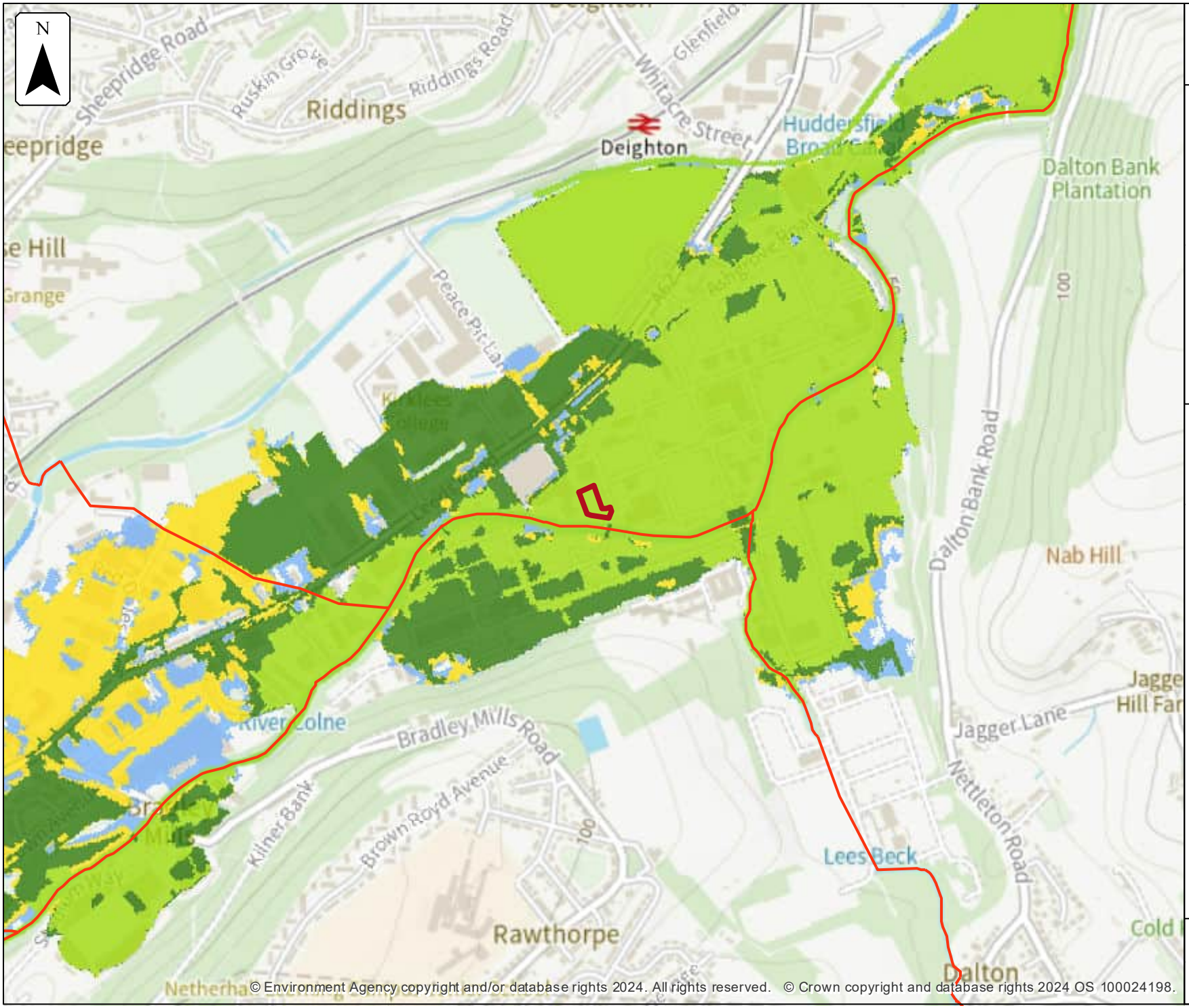
- Selected area
- Main river

Modelled flood extent

- 5% AEP
- 2% AEP
- 1.33% AEP
- 1% AEP
- 0.1% AEP

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

0 100 200 300 400 500
metres



Environment Agency

Defences removed climate change modelled fluvial extent

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

Model name
2019 Colne Model

Selected area

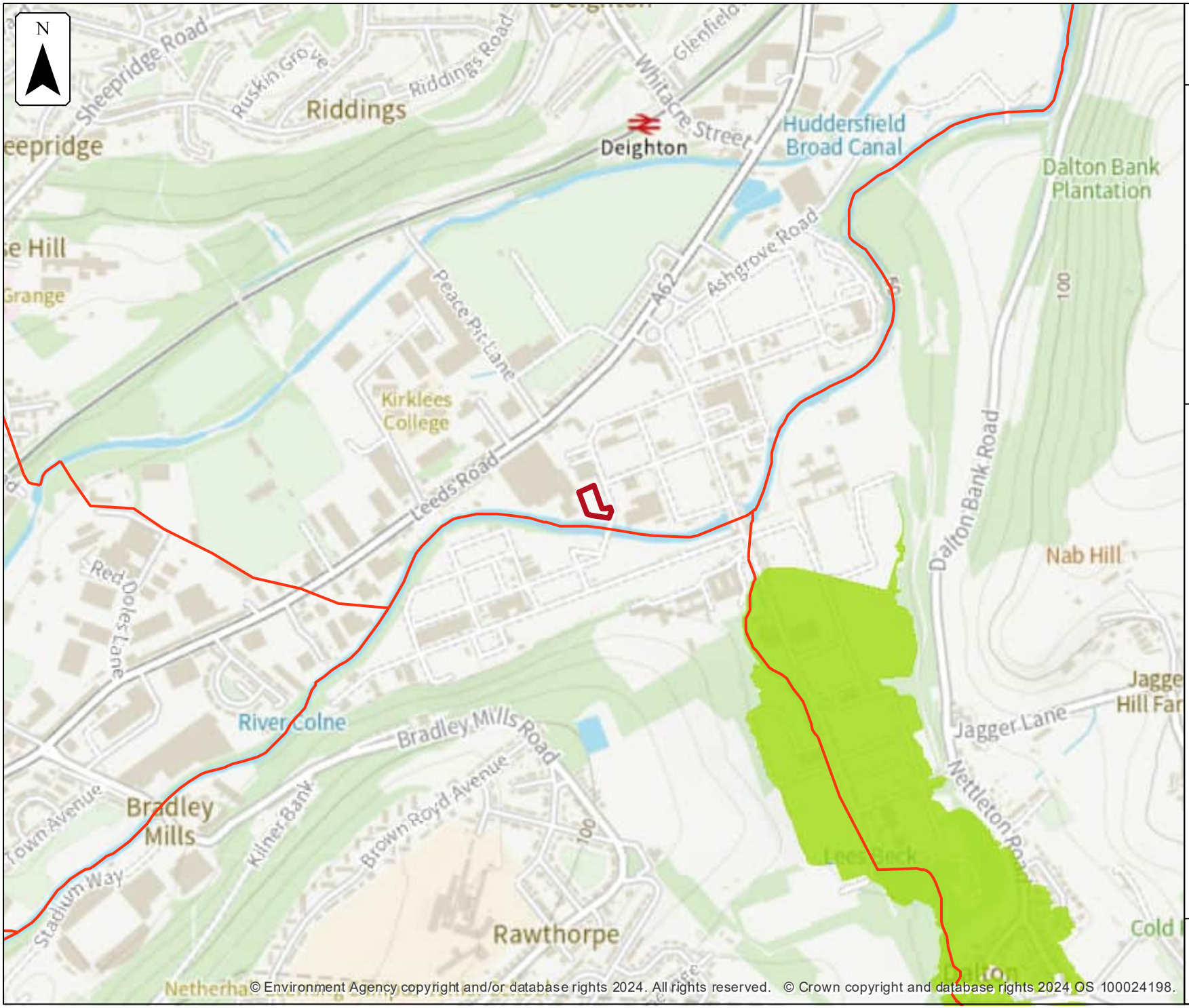
Main river

Modelled flood extent

- 1.0% AEP (+20%)
- 1.0% AEP (+30%)
- 1.0% AEP (+50%)
- 0.1% AEP (+20%)

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

0 100 200 300 400 500
metres



Environment Agency

Defences removed climate change modelled fluvial extent

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

Model name
2007 Fenay Beck

Selected area

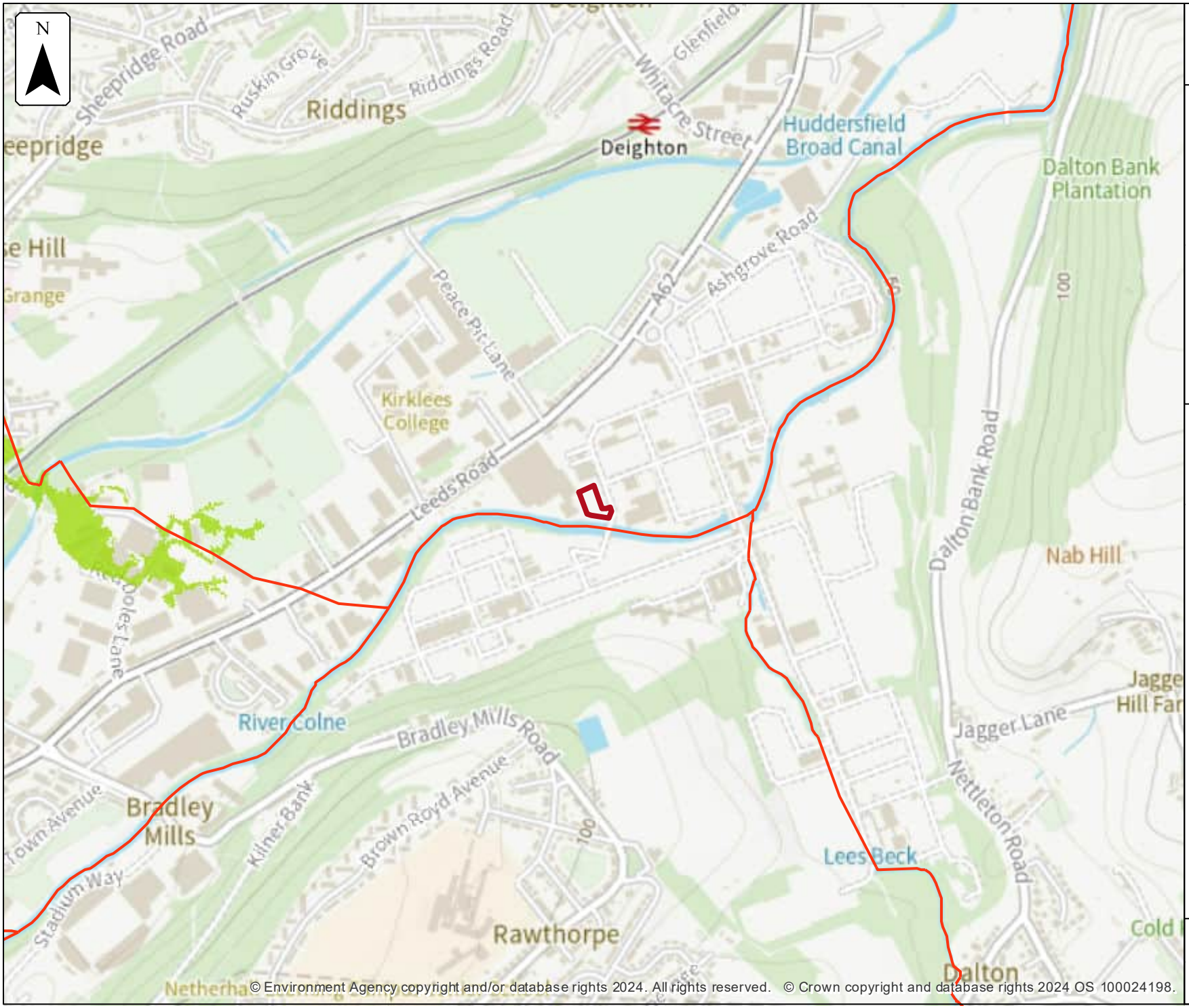
Main river

Modelled flood extent

1.0% AEP (+20%)

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

0 100 200 300 400 500
metres



Environment Agency

No defences exist climate change modelled fluvial extent

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

Model name
2011 Huddersfield Study - Allison Dike

Selected area

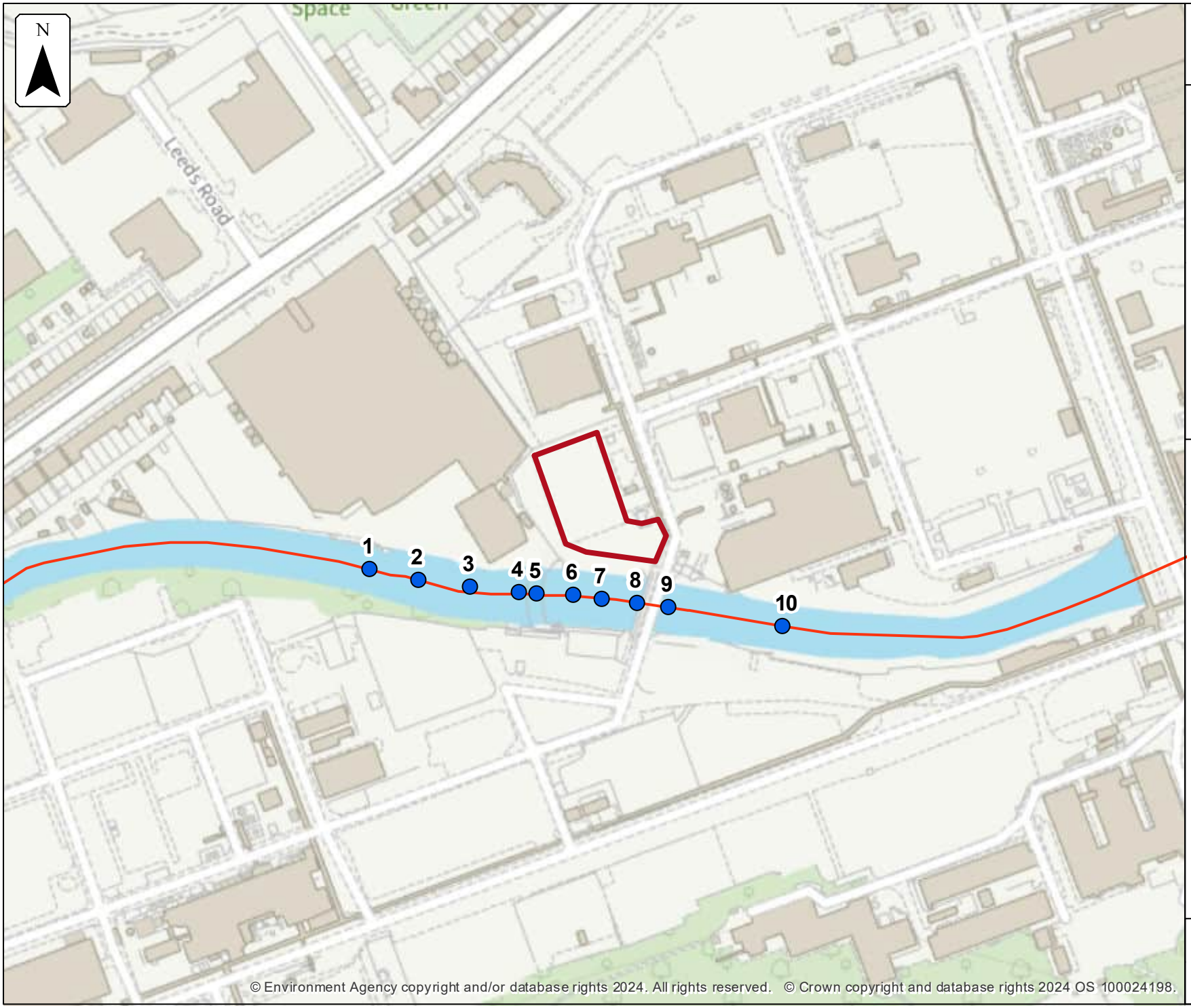
Main river

Modelled flood extent

1.0% AEP (+20%)

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

0 100 200 300 400 500
metres



Environment Agency

Defended modelled fluvial node locations

Location (easting/northing)
416359/418377

Scale
1:2,500

Created
28 Feb 2024

Model name
2019 Colne Model

Selected area
Modelled location
Main river

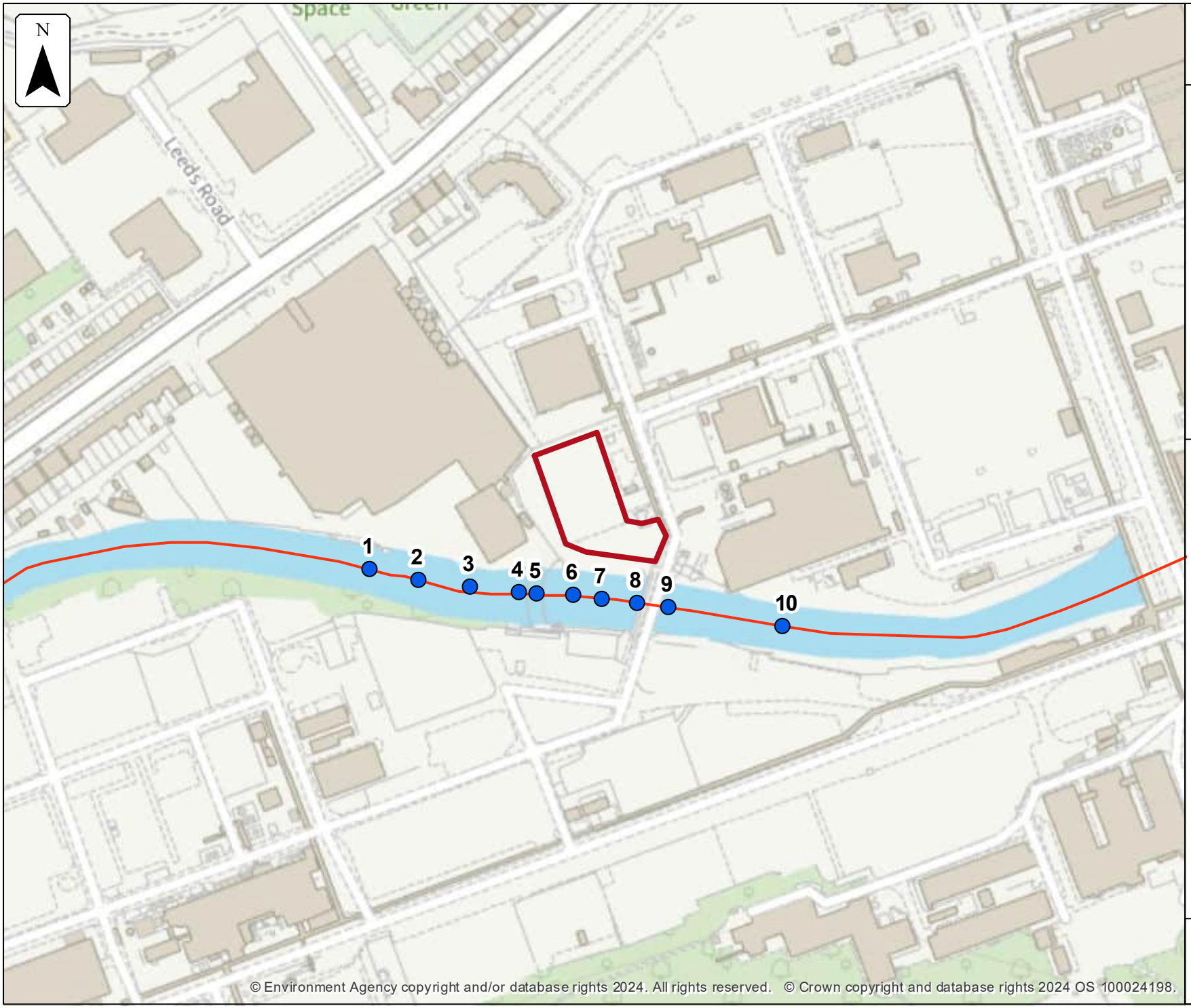
0 25 50 75 100
metres

Modelled node locations data

Defended

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	1198019	416251	418345	55.05	107.84	55.33	132.36	55.43	143.98	55.55	153.27	55.67	164.44	55.79	170.18
2	1198063	416274	418340	54.99	107.83	55.28	132.35	55.38	143.63	55.51	152.58	55.63	162.58	55.77	167.05
3	1197788	416300	418336	54.94	107.82	55.23	132.35	55.32	143.46	55.45	152.78	55.58	162.65	55.71	169.98
4	1197808	416323	418334	54.92	107.82	55.21	132.27	55.30	142.79	55.45	151.22	55.56	159.35	55.70	168.69
5	1198048	416332	418333	54.61	107.82	54.86	132.27	54.94	142.79	55.12	151.22	55.24	159.35	55.38	168.69
6	1198281	416350	418332	54.51	107.81	54.74	132.27	54.81	143.02	55.0	151.90	55.11	160.0	55.25	173.72
7	1197857	416363	418330	54.49	107.80	54.73	132.16	54.80	142.49	55.02	150.68	55.15	158.58	55.32	160.56
8	1198092	416381	418328	54.49	107.79	54.72	132.16	54.78	142.49	55.01	150.46	55.16	156.32	55.34	160.40
9	1198049	416396	418326	54.49	107.79	54.72	132.16	54.78	142.49	54.85	150.46	54.97	156.32	55.16	160.40
10	1197873	416451	418317	54.38	105.22	54.64	120.32	54.71	126.68	54.79	131.14	54.92	136.58	55.13	142.09

Data in this table comes from the 2019 Colne Model model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

Defences removed modelled fluvial node locations

Location (easting/northing)
416359/418377

Scale
1:2,500

Created
28 Feb 2024

Model name
2019 Colne Model

Selected area
Modelled location
Main river

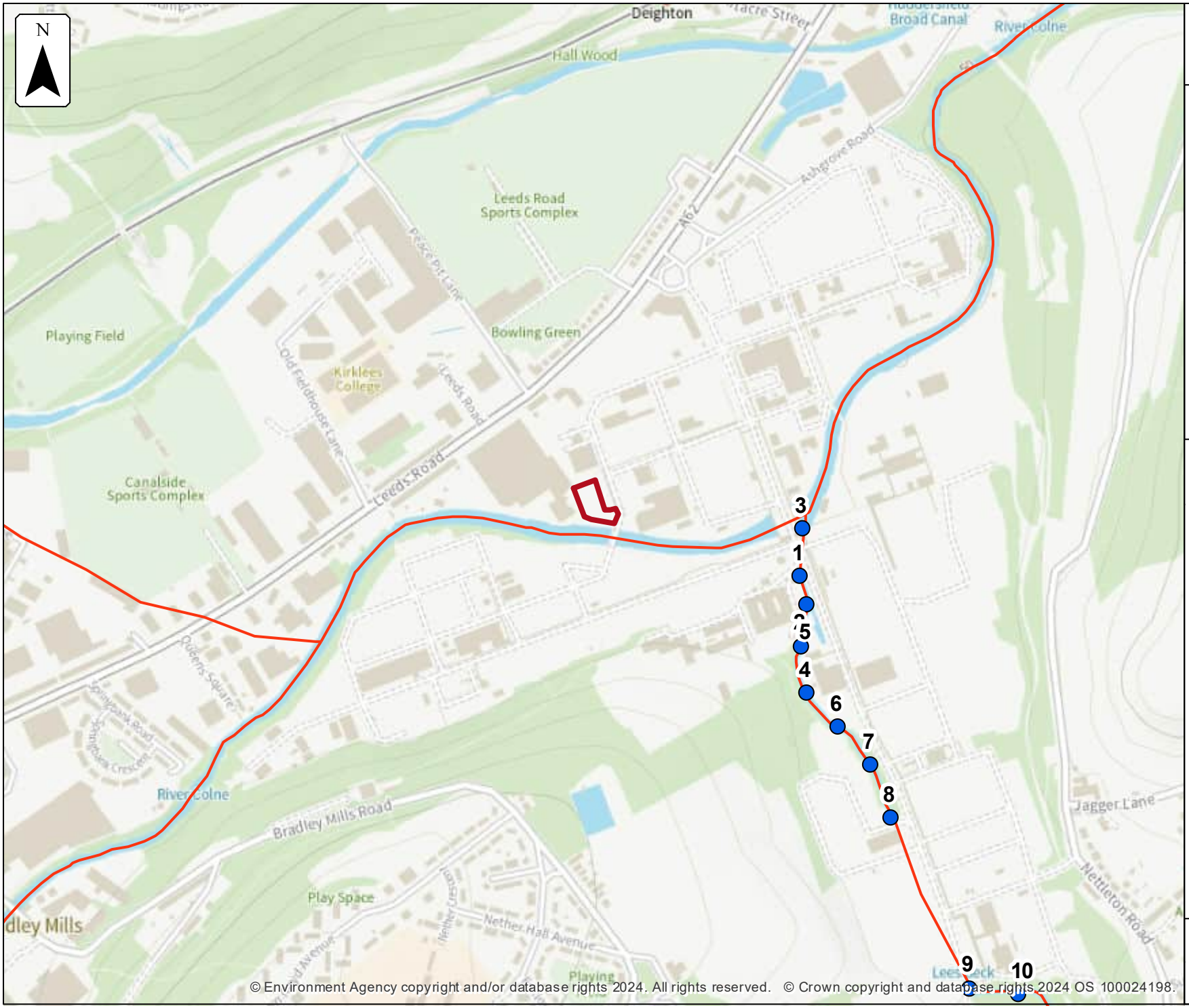
0 25 50 75 100
metres

Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	4% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	1198019	416251	418345							55.55	153.27			55.79	170.19
2	1198063	416274	418340							55.50	152.58			55.77	167.07
3	1197788	416300	418336							55.45	152.78			55.71	170.0
4	1197808	416323	418334							55.44	151.23			55.70	168.73
5	1198048	416332	418333							55.11	151.23			55.38	168.73
6	1198281	416350	418332							54.99	151.91			55.25	173.76
7	1197857	416363	418330							55.01	150.69			55.32	160.69
8	1198092	416381	418328							55.01	150.49			55.34	160.53
9	1198049	416396	418326							54.85	150.49			55.16	160.53
10	1197873	416451	418317							54.78	131.18			55.12	142.25

Data in this table comes from the 2019 Colne Model model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

Defences removed modelled fluvial node locations

Location (easting/northing)
416359/418377

Scale
1:7,500

Created
28 Feb 2024

Model name
2007 Fenay Beck

Selected area
Modelled location
Main river

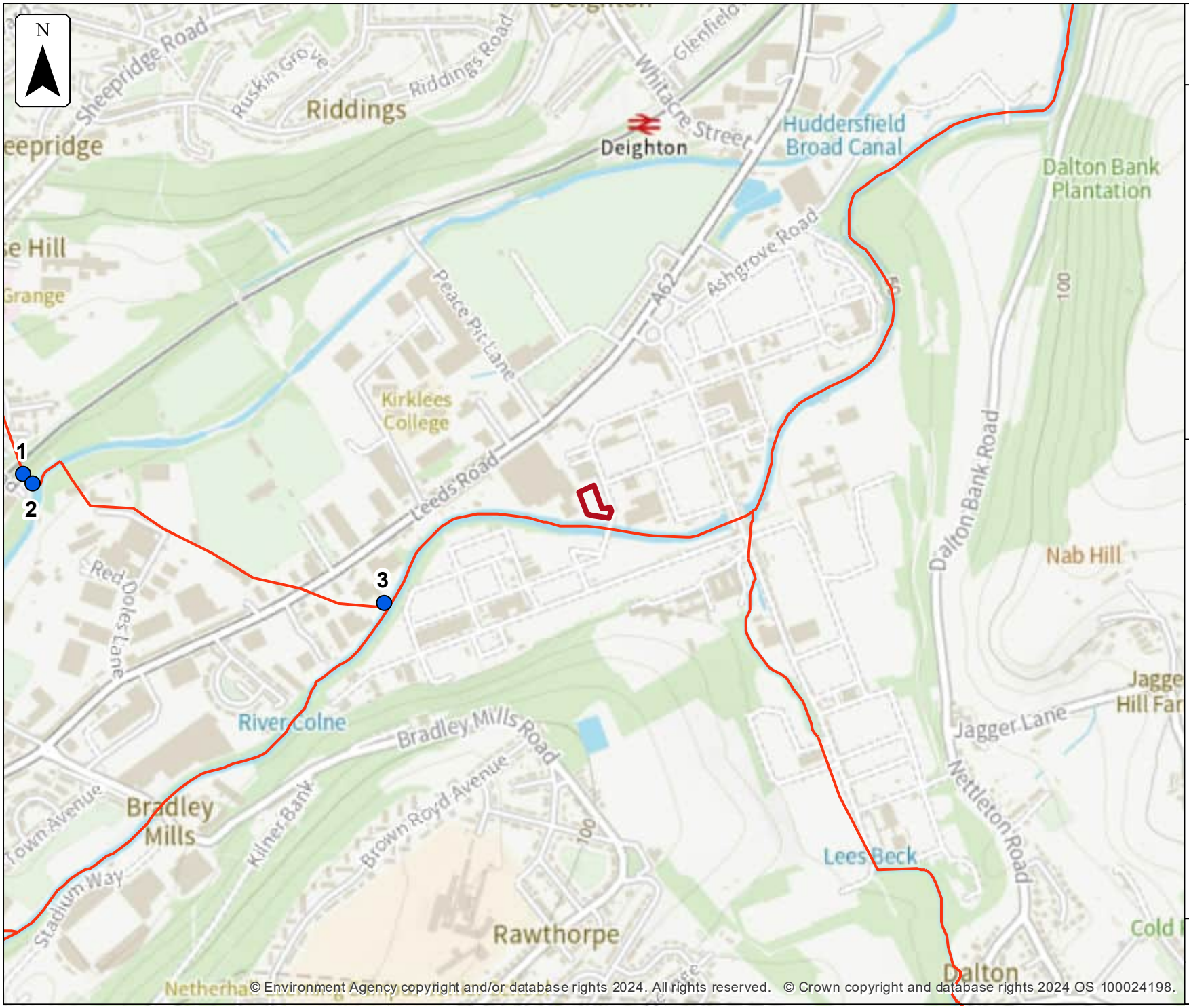
0 100 200 300
metres

Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	4% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	969291	416661	418270	54.42	50.79	54.55	58.32	54.68	62.59	54.84	67.76			55.80	125.29
2	969297	416662	418169	54.77	50.80	54.86	58.40	54.94	62.73	55.03	68.66			55.84	125.86
3	969289	416665	418340	54.25	50.79	54.50	58.32	54.66	62.59	54.83	67.76			55.80	125.29
4	969288	416672	418100	54.92	50.82	55.03	58.41	55.10	62.77	55.18	69.0			55.89	126.56
5	969352	416672	418228	54.53	50.79	54.62	58.35	54.73	62.65	54.88	68.02			55.81	125.44
6	969317	416718	418050	55.09	50.87	55.15	58.46	55.20	62.90	55.27	69.51			55.92	133.47
7	969377	416764	417994	55.03	50.89	55.04	58.47	55.06	63.05	55.09	69.79			55.98	127.98
8	969305	416793	417918	55.09	50.89	55.09	58.47	55.10	63.07	55.21	69.80			56.23	128.07
9	969342	416909	417668	57.37	50.90	57.69	58.47	58.05	63.17	58.77	69.80			59.46	128.07
10	969370	416982	417660	57.91	50.89	58.32	58.50	58.71	63.60	58.95	69.86			59.52	128.08

Data in this table comes from the 2007 Fenay Beck model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

No defences exist modelled fluvial node locations

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

Model name
2011 Huddersfield Study - Allison Dike

Selected area
Modelled location
Main river

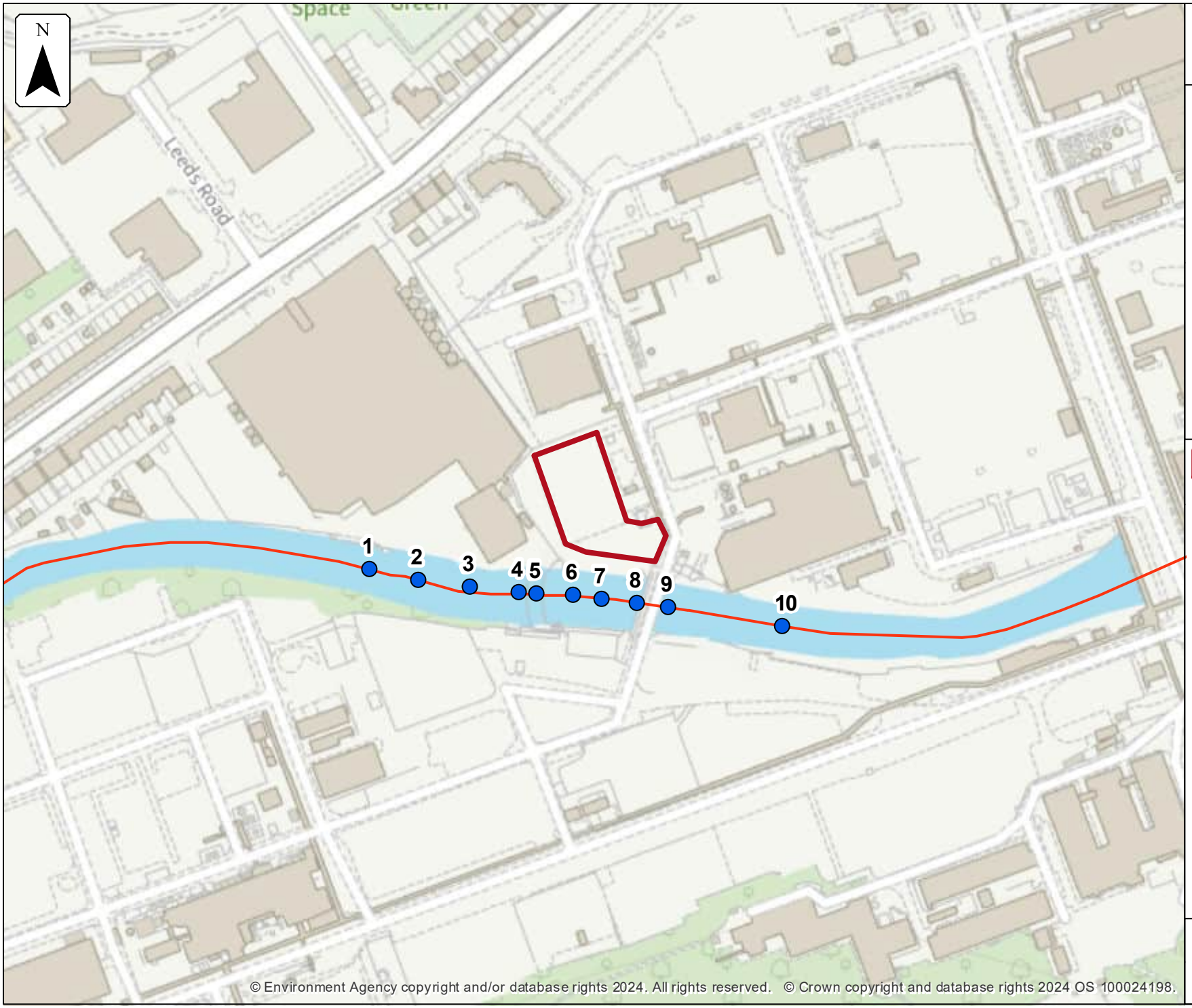
0 100 200 300 400 500
metres

Modelled node locations data

No defences exist

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	221867	415249	418435	61.85	3.0	62.01	3.23	61.99	3.27	62.08	3.27			61.85	2.96
2	280133	415268	418415	60.40	3.0	60.52	3.46	60.60	3.72	60.73	4.33			60.39	2.96
3	46654	415953	418182	52.37	3.0	52.42	3.44	52.44	3.72	52.50	4.32			52.35	2.87

Data in this table comes from the 2011 Huddersfield Study - Allison Dike and Blackhouse Dike model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

Defences removed climate change modelled fluvial node locations

Location (easting/northing)
416359/418377

Scale
1:2,500

Created
28 Feb 2024

Model name
2019 Colne Model

Selected area
Modelled location
Main river

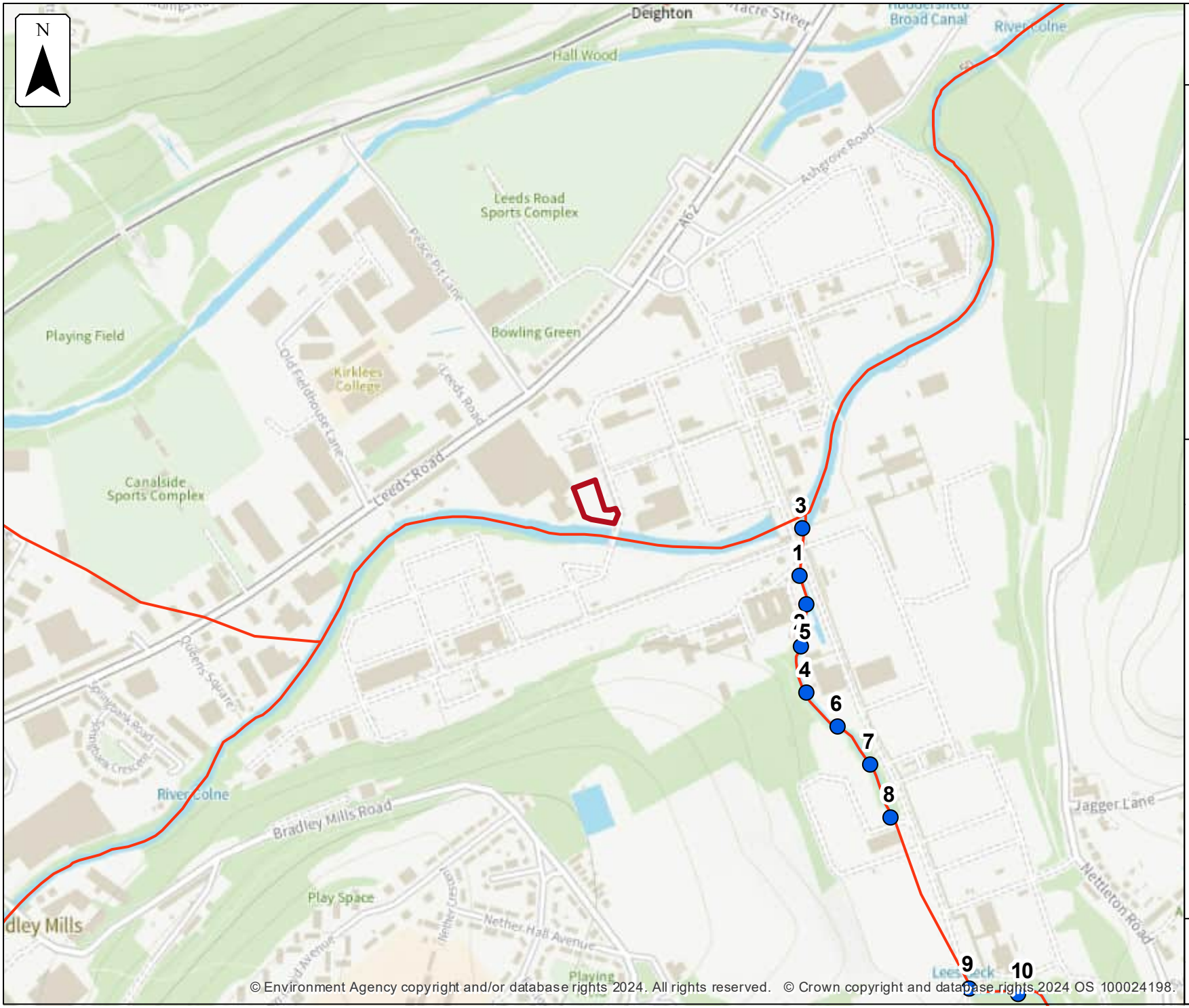
0 25 50 75 100
metres

Modelled node locations data

Defences removed climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+20%)		1.0% AEP (+30%)		1.0% AEP (+50%)		0.1% AEP (+20%)	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	1198019	416251	418345	55.68	163.63	55.72	164.56	55.79	169.17	55.92	182.60
2	1198063	416274	418340	55.65	161.72	55.69	162.66	55.77	165.99	55.90	178.31
3	1197788	416300	418336	55.59	161.70	55.64	163.21	55.72	168.68	55.84	182.37
4	1197808	416323	418334	55.58	158.03	55.63	161.80	55.71	167.11	55.84	180.31
5	1198048	416332	418333	55.26	158.03	55.31	161.80	55.40	167.11	55.52	180.31
6	1198281	416350	418332	55.13	160.91	55.18	165.53	55.27	171.92	55.39	187.21
7	1197857	416363	418330	55.18	156.44	55.24	158.51	55.35	158.97	55.48	161.62
8	1198092	416381	418328	55.18	155.81	55.25	156.15	55.37	157.38	55.52	160.96
9	1198049	416396	418326	55.0	155.81	55.07	156.15	55.20	157.38	55.35	160.96
10	1197873	416451	418317	54.95	135.77	55.03	136.25	55.18	137.38	55.33	143.17

Data in this table comes from the 2019 Colne Model model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

Defences removed climate change modelled fluvial node locations

Location (easting/northing)
416359/418377

Scale
1:7,500

Created
28 Feb 2024

Model name
2007 Fenay Beck

- Selected area
- Modelled location
- Main river

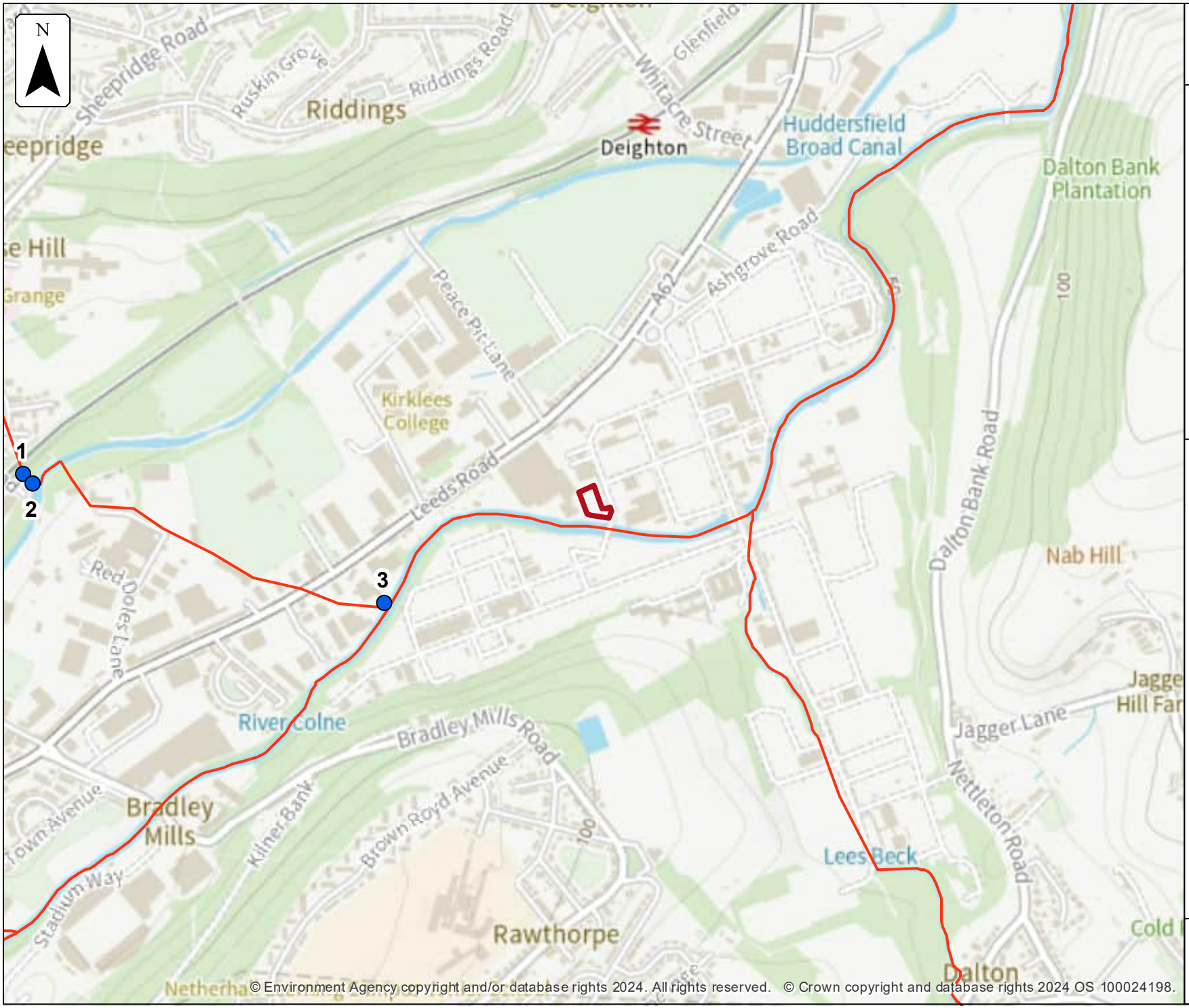
0 100 200 300
metres

Modelled node locations data

Defences removed climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+20%)	
				Level	Flow
1	969291	416661	418270	55.18	83.87
2	969297	416662	418169	55.27	84.22
3	969289	416665	418340	55.18	83.87
4	969288	416672	418100	55.39	84.48
5	969352	416672	418228	55.20	83.98
6	969317	416718	418050	55.46	84.91
7	969377	416764	417994	55.34	85.13
8	969305	416793	417918	55.50	85.15
9	969342	416909	417668	59.02	85.15
10	969370	416982	417660	59.12	85.18

Data in this table comes from the 2007 Fenay Beck model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

No defences exist climate change modelled fluvial node locations

Location (easting/northing)
416359/418377

Scale
1:10,000

Created
28 Feb 2024

Model name
2011 Huddersfield Study - Allison Dike

Selected area
Modelled location
Main river

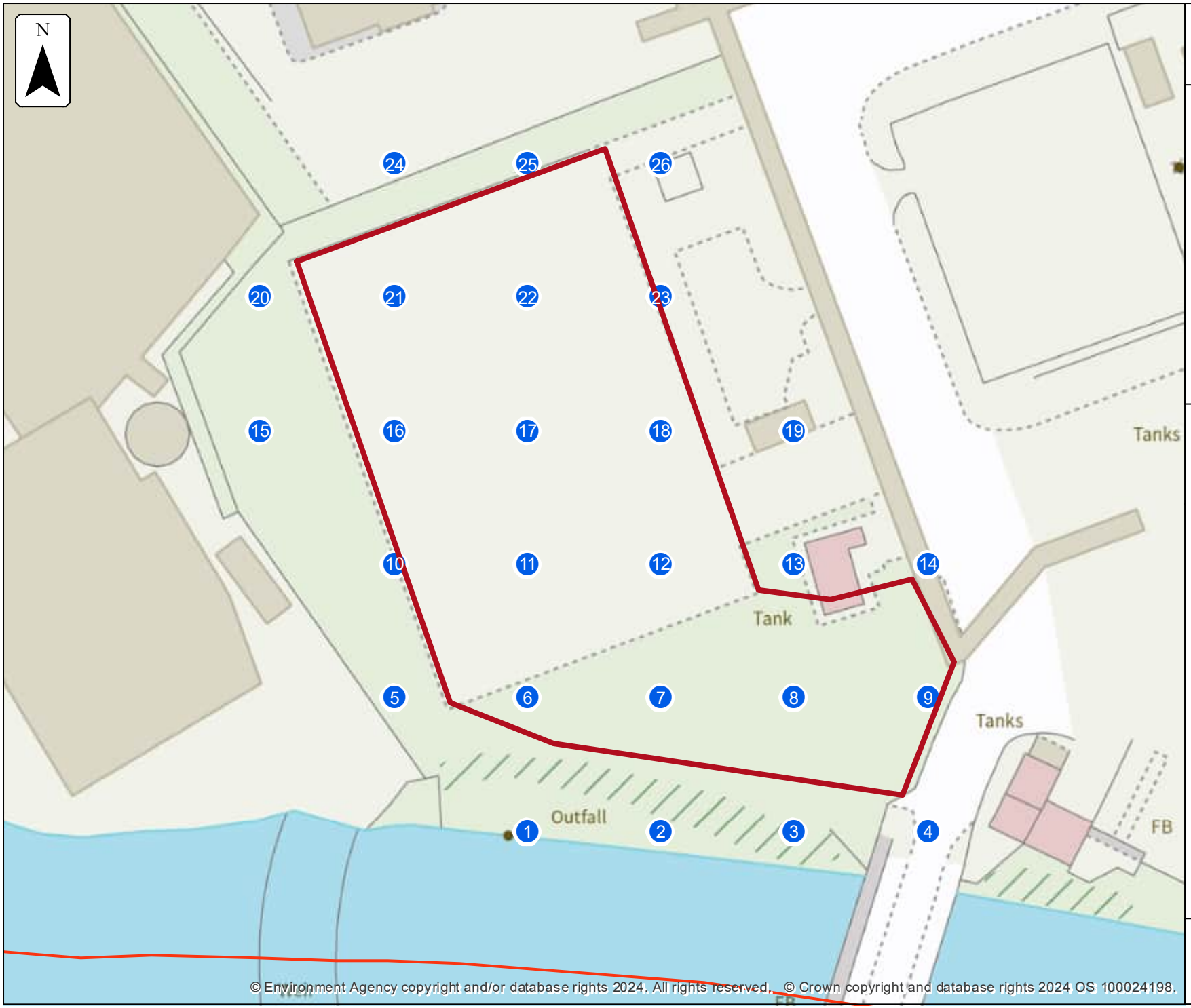
0 100 200 300 400 500
metres

Modelled node locations data

No defences exist climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+20%)	
				Level	Flow
1	221867	415249	418435	62.23	3.27
2	280133	415268	418415	61.12	5.48
3	46654	415953	418182	52.61	5.47

Data in this table comes from the 2011 Huddersfield Study - Allison Dike and Blackhouse Dike model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

Defended modelled fluvial extent and height

Location (easting/northing)
416359/418377

Scale
1:500

Created
28 Feb 2024

Model name
2019 Colne Model

- Selected area
- Main river

Modelled 2D grid
Water level in mAOD

- 0 - 54.0
- 54.0 - 54.25
- 54.25 - 54.5
- 54.5 - 54.75
- 54.75 - 55.0
- 55.0 - 55.25
- 55.25 - 55.5
- 55.5 - 55.75
- 55.75 - 56.0

This map shows the 0.1% AEP height data

0 5 10 15 20
metres

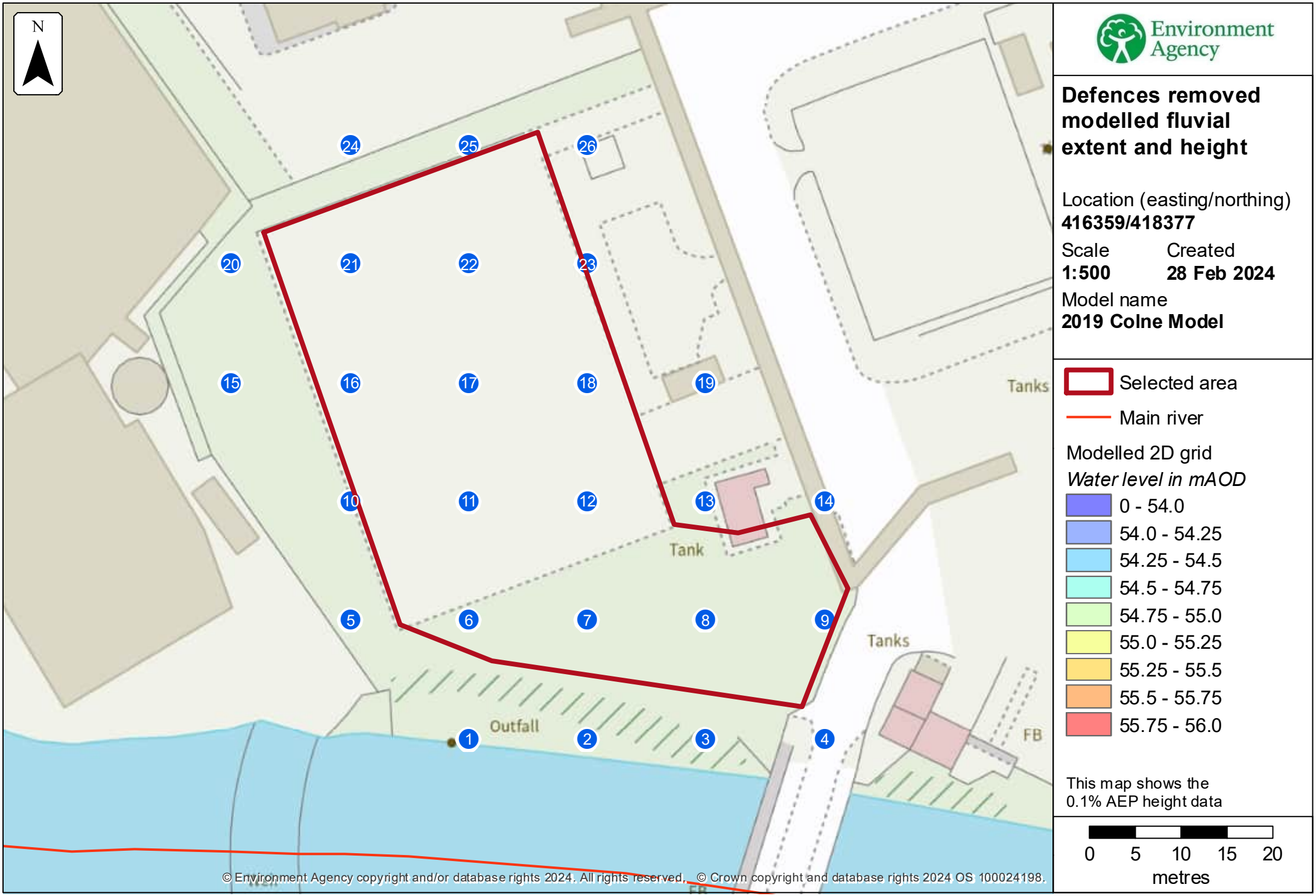
Sample point data

Defended

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
1	416353	418345	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
2	416366	418345	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	416379	418345	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
4	416392	418345	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	416340	418358	NoData	NoData	NoData	NoData	0.01	54.68	0.06	54.78	0.15	54.93	0.27	55.16
6	416353	418358	NoData	NoData	0.01	54.58	0.05	54.65	0.12	54.80	0.24	54.92	0.42	55.10
7	416366	418358	NoData	NoData	0.01	54.65	0.04	54.71	0.19	54.86	0.32	54.98	0.47	55.13
8	416379	418358	NoData	NoData	NoData	NoData	0.01	54.72	0.11	54.82	0.22	54.93	0.39	55.10
9	416392	418358	0.02	54.35	0.22	54.58	0.30	54.65	0.42	54.77	0.56	54.91	0.77	55.13
10	416340	418371	NoData	NoData	0.04	54.58	0.11	54.65	0.24	54.78	0.39	54.93	0.61	55.15
11	416353	418371	NoData	NoData	0.20	54.58	0.27	54.65	0.40	54.79	0.55	54.94	0.77	55.15
12	416366	418371	0.07	54.35	0.30	54.58	0.38	54.65	0.51	54.78	0.65	54.92	0.86	55.14
13	416379	418371	0.37	54.35	0.59	54.58	0.67	54.65	0.79	54.77	0.93	54.91	1.14	55.13
14	416392	418371	0.29	54.35	0.51	54.58	0.59	54.65	0.71	54.77	0.85	54.92	1.07	55.13
15	416327	418384	NoData	NoData	NoData	NoData	0.01	54.68	0.11	54.78	0.26	54.92	0.47	55.13
16	416340	418384	NoData	NoData	0.17	54.58	0.25	54.65	0.37	54.78	0.52	54.92	0.73	55.14

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
17	416353	418384	0.02	54.35	0.25	54.58	0.32	54.65	0.45	54.78	0.60	54.92	0.81	55.14
18	416366	418384	0.10	54.35	0.33	54.58	0.40	54.65	0.52	54.77	0.66	54.91	0.87	55.12
19	416379	418384	0.24	54.35	0.47	54.58	0.54	54.65	0.66	54.77	0.81	54.92	1.03	55.13
20	416327	418397	NoData	NoData	0.09	54.58	0.15	54.65	0.28	54.88	0.41	55.01	0.59	55.19
21	416340	418397	NoData	NoData	0.23	54.58	0.30	54.65	0.42	54.77	0.57	54.92	0.78	55.13
22	416353	418397	0.08	54.35	0.31	54.58	0.38	54.65	0.50	54.77	0.65	54.92	0.86	55.13
23	416366	418397	0.22	54.35	0.45	54.58	0.53	54.65	0.64	54.77	0.79	54.91	1.00	55.12
24	416340	418410	0.01	54.35	0.24	54.58	0.31	54.65	0.43	54.77	0.58	54.92	0.79	55.13
25	416353	418410	0.09	54.35	0.32	54.58	0.39	54.65	0.51	54.77	0.65	54.91	0.87	55.12
26	416366	418410	0.21	54.35	0.44	54.58	0.51	54.65	0.63	54.76	0.77	54.90	0.98	55.12

Data in this table comes from the 2019 Colne Model model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.



Environment Agency

Defences removed modelled fluvial extent and height

Location (easting/northing)
416359/418377

Scale
1:500

Created
28 Feb 2024

Model name
2019 Colne Model

Selected area

Main river

Modelled 2D grid

Water level in mAOD

- 0 - 54.0
- 54.0 - 54.25
- 54.25 - 54.5
- 54.5 - 54.75
- 54.75 - 55.0
- 55.0 - 55.25
- 55.25 - 55.5
- 55.5 - 55.75
- 55.75 - 56.0

This map shows the 0.1% AEP height data

0 5 10 15 20
metres

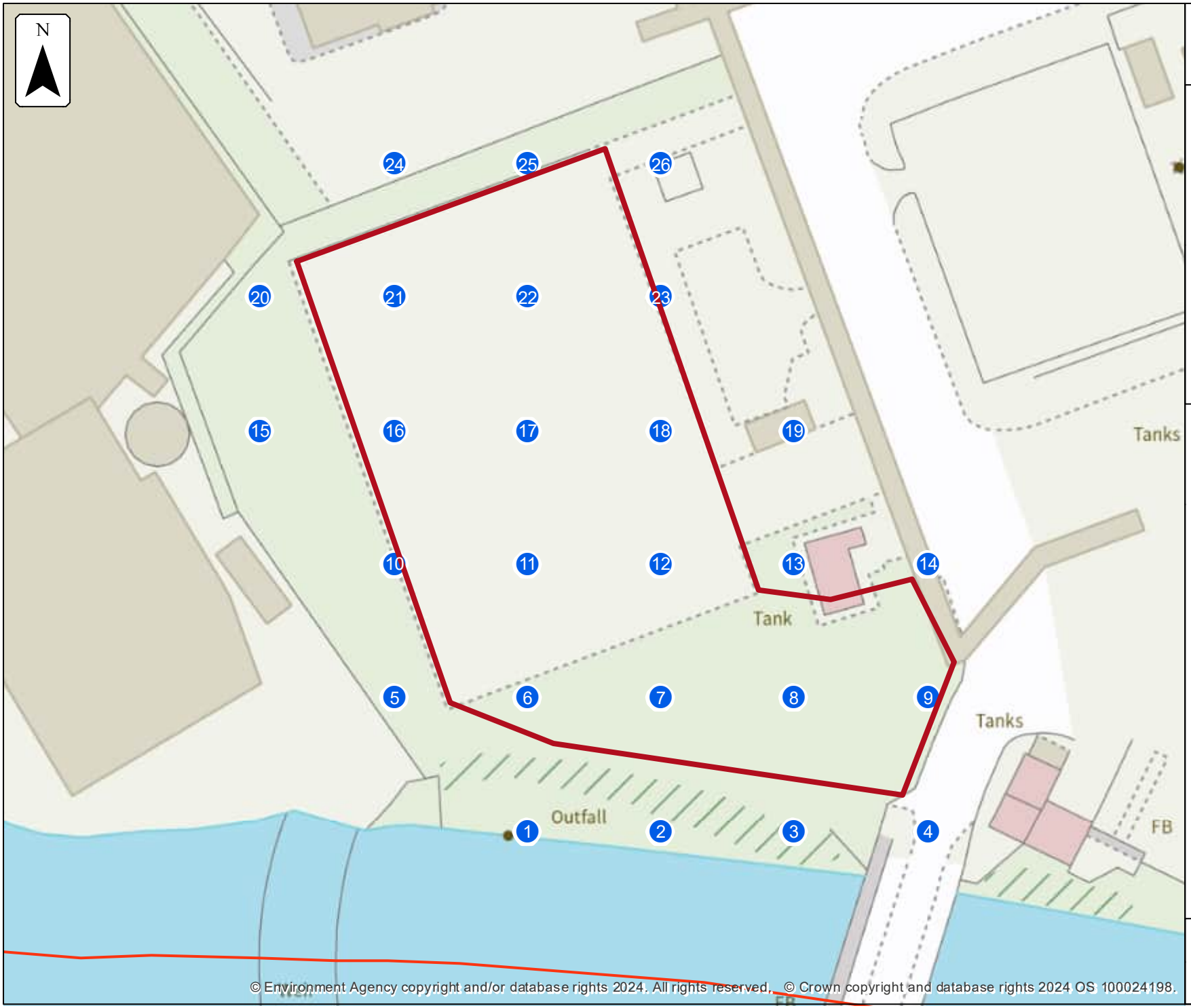
Sample point data

Defences removed

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
1	416353	418345							NoData	NoData			NoData	NoData
2	416366	418345							NoData	NoData			NoData	NoData
3	416379	418345							NoData	NoData			NoData	NoData
4	416392	418345							NoData	NoData			NoData	NoData
5	416340	418358							0.06	54.78			0.27	55.15
6	416353	418358							0.12	54.80			0.41	55.10
7	416366	418358							0.19	54.85			0.47	55.13
8	416379	418358							0.10	54.82			0.38	55.10
9	416392	418358							0.41	54.77			0.76	55.12
10	416340	418371							0.24	54.78			0.60	55.14
11	416353	418371							0.40	54.78			0.76	55.15
12	416366	418371							0.50	54.78			0.86	55.13
13	416379	418371							0.78	54.77			1.13	55.12
14	416392	418371							0.70	54.77			1.06	55.12
15	416327	418384							0.11	54.77			0.46	55.13
16	416340	418384							0.37	54.77			0.72	55.13

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
17	416353	418384							0.44	54.77			0.80	55.13
18	416366	418384							0.52	54.77			0.86	55.11
19	416379	418384							0.66	54.77			1.02	55.13
20	416327	418397							0.27	54.88			0.58	55.19
21	416340	418397							0.42	54.77			0.77	55.12
22	416353	418397							0.50	54.77			0.85	55.12
23	416366	418397							0.64	54.76			0.99	55.12
24	416340	418410							0.43	54.77			0.78	55.12
25	416353	418410							0.51	54.76			0.86	55.12
26	416366	418410							0.63	54.76			0.97	55.11

Data in this table comes from the 2019 Colne Model model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.



Environment Agency

Defences removed climate change modelled fluvial extent and height

Location (easting/northing)
416359/418377

Scale
1:500

Created
28 Feb 2024

Model name
2019 Colne Model

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 54.0
- 54.0 - 54.25
- 54.25 - 54.5
- 54.5 - 54.75
- 54.75 - 55.0
- 55.0 - 55.25
- 55.25 - 55.5
- 55.5 - 55.75
- 55.75 - 56.0

This map shows the 0.1% AEP +20% height data

0 5 10 15 20
metres

Sample point data

Defences removed climate change

Label	Easting	Northing	1% AEP (+20%)		1% AEP (+30%)		1% AEP (+50%)		0.1% AEP (+20%)	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height
1	416353	418345	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
2	416366	418345	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	416379	418345	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
4	416392	418345	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	416340	418358	0.01	54.69	0.21	55.04	0.30	55.20	0.43	55.36
6	416353	418358	0.06	54.67	0.34	55.02	0.46	55.14	0.64	55.32
7	416366	418358	0.06	54.72	0.40	55.06	0.51	55.17	0.65	55.32
8	416379	418358	0.02	54.73	0.31	55.02	0.43	55.15	0.59	55.30
9	416392	418358	0.31	54.67	0.67	55.03	0.82	55.17	0.99	55.34
10	416340	418371	0.13	54.67	0.51	55.05	0.65	55.19	0.83	55.37
11	416353	418371	0.29	54.67	0.67	55.05	0.82	55.20	0.99	55.37
12	416366	418371	0.39	54.67	0.77	55.04	0.91	55.19	1.09	55.36
13	416379	418371	0.68	54.67	1.04	55.03	1.19	55.18	1.37	55.36
14	416392	418371	0.60	54.67	0.97	55.03	1.12	55.18	1.29	55.36
15	416327	418384	0.02	54.68	0.37	55.04	0.52	55.18	0.68	55.35
16	416340	418384	0.26	54.67	0.64	55.04	0.78	55.19	0.95	55.36

Label	Easting	Northing	1% AEP (+20%)		1% AEP (+30%)		1% AEP (+50%)		0.1% AEP (+20%)	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height
17	416353	418384	0.34	54.67	0.71	55.04	0.86	55.19	1.03	55.36
18	416366	418384	0.42	54.67	0.78	55.03	0.92	55.17	1.10	55.35
19	416379	418384	0.56	54.67	0.93	55.04	1.08	55.19	1.26	55.37
20	416327	418397	0.16	54.67	0.51	55.11	0.63	55.24	0.78	55.38
21	416340	418397	0.32	54.67	0.69	55.04	0.83	55.18	1.00	55.36
22	416353	418397	0.40	54.67	0.76	55.03	0.91	55.18	1.09	55.36
23	416366	418397	0.54	54.67	0.90	55.03	1.05	55.18	1.23	55.35
24	416340	418410	0.33	54.67	0.69	55.03	0.84	55.18	1.01	55.35
25	416353	418410	0.41	54.67	0.77	55.03	0.92	55.18	1.09	55.35
26	416366	418410	0.53	54.66	0.89	55.02	1.03	55.17	1.20	55.34

Data in this table comes from the 2019 Colne Model model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.

Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

Find out more about flood risk activity permits

Help and advice

Contact the Yorkshire Environment Agency team at neyorkshire@environment-agency.gov.uk for:

- more information about getting a product 5, 6, 7 or 8
- general help and advice about the site you're requesting data for

RFI/2024/350175

The Flood Map for Planning

The Flood Map for Planning (Rivers and Sea) can be viewed and downloaded as a PDF file on GOV.UK by following this link: https://flood-map-for-planning.service.gov.uk **or downloaded in GIS format under an open data licence from the following address**: https://environment.data.gov.uk/
Please type Flood Map for Planning in the search box.

What is the Flood Map for Planning?

The Flood Map for Planning provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences.

The Flood Map for Planning shows the following:

1. Flood Zone 3 (dark blue area on the enclosed map): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences
    - For flooding from rivers the map indicates the extent of a flood with a 1% (1 in 100) chance of happening each year;
    - For flooding from the sea the map shows the extent of a flood with a 0.5% (1 in 200) chance of happening each year.

2. Flood Zone 2 (light blue area): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences. Flood Zone 2:
    - indicates the extent of a flood with a 0.1% (1 in 1000) chance of happening each year.
    - and/or indicates the greatest recorded historic flood, whichever is greater.

3. Flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, together with some natural or constructed entities which retain, store or channel water and which may protect against smaller floods.

4. Areas benefiting from flood defences - areas that benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would flood.

Flood History (if applicable)

See the attached map showing the flood history for this site. The extent of flooding, and/or flood level information is only shown for those watercourses surveyed after the flood. Other flooding may have occurred which is not shown. This is the best information currently available. Please note that for this reason, we are unable to confirm if flooding has occurred at a property scale. The Flood History Map PDF we have provided shows the area of land that has flooded rather than any individual property.
Please refer to the attached table detailing the causes of those past floods.

In the attached data, there may be outlines which have not been included; these have a Flood Map or Historical Flood Map status of "Considered and Rejected". This could be for various reasons, including but not limited to the outline consisting of flooding from surface water, overland flow, or sewage. It could also be a result of the data being of very poor quality, or in some cases, where changes in the area make a historical flood outline no longer representative of the flood risk, e.g. ground raising or flow path changes. This data can be supplied on request, where it is available.

Water causing flooding can come from different places, for example from rivers or the sea; surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system); overflowing or backing up of sewers or drainage systems which have been overwhelmed or from groundwater rising up from underground aquifers.

Please note that this record doesn't include all the flooding that may have occurred including and since 1st November 2023. Given the process of recording, verifying and updating our record from major floods is extensive and may take a considerable amount of time.

Assets (if applicable)

Asset Location Map

Please find attached asset map(s) showing the location of all (Agency and non-Agency maintained) flood defences.

Description of Works

See attached table with description of the defences shown on the above drawing, including condition ratings, upstream and downstream crest levels, where available.

Risk of Flooding – Environment Agency Defences
The risk of flooding in this area is now reduced by the presence of flood defences that we maintain, but there still is a residual risk of flooding if these were to breach or be overtopped by a flood greater than that for which they were designed.

Risk of Flooding – Privately Maintained Defences
You will see that the Environment Agency does not maintain any of those defences. However, we undertake regular risk based visual inspections. We do not hold design levels and have no height information on these defences.

Asset Condition Ratings
The performance of a flood defence asset is recorded as the condition of the asset. Our asset inspectors subjectively assess the conditions of assets (during visual inspection site visits) with reference to a national standard template. Each asset is given a rating between one and five with one being very good condition and five being very poor. A condition rating of 3, or 'fair' is the minimal acceptable standard for a critical asset, such as a defence wall that protects properties. We are striving to improve all assets below 'fair' to an acceptable standard.
Asset inspections are done on average every six months, although some critical assets are assessed on a more regular basis. It is possible that adjacent assets are inspected on different dates, which may result in two assets of a similar state of repair having different condition ratings.
Condition ratings of assets may also be affected by the time of year the surveys are conducted, as vegetation may obscure the asset in the summer months, or accessibility may be an issue during winter months. These factors would not usually affect the recorded condition rating of an asset unless the asset is on a borderline between two ratings.

Asset Standard of Protection
Please note that the provided Design Standard of Protection is an estimate and should not be relied on. Please note that where available the defended flood extents provide more reliable information relating to the protection offered by the defence (i.e. at which return period the water levels are likely to overtop the defence). If available and required, the defended flood extents can be provided on request.

Modelling
Please note that whilst the information provided is our best available data, we do not guarantee that is sufficient for land use planning or other such purposes. It is the applicant’s responsibility to assess the suitability of the provided model/data for their purposes.

Climate Change

Updated guidance on how climate change could affect flood risk to new development - 'Flood risk assessments: climate change allowances' was published on gov.uk on 19 February 2016. You should confirm the flood risk vulnerability classification and lifetime of your proposed development in line with NPPF and apply the appropriate climate change allowances.

Bespoke Flood Risk Assessment (FRA) advice:

If the pre-application advice is required with regards the preparation of a site-specific Flood Risk Assessment, this can be requested via the Yorkshire Sustainable Places team (email: sp-yorkshire@environment-agency.gov.uk). Charges may apply for any advice that is provided, this currently stands at £100 per hour per person. The .gov.uk pages provide a good starting point on what to include within a site-specific Flood Risk Assessment and can be accessed via https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications. A site-specific Flood Risk Assessment will need to consider flood risks from all sources, including those associated with defence failure (e.g. breach) and accounting for the predicted impacts as a result of climate change. Please contact the Sustainable Places team if you require advice on how to include these within a Flood Risk Assessment.

Other

Surface Water Map

Lead Local Flood Authorities (LLFA) are responsible for managing local flood risk from surface water flooding and groundwater flooding. You should check with the LLFA as they may have more up to date information regarding this type of flooding.

The Risk of Flooding from Surface Water Flood Map can be viewed and downloaded as a PDF file on GOV.UK by following this link: https://flood-warning-information.service.gov.uk/long-term-flood-risk

Surface Water Drainage

The Lead Local Flood Authority is the statutory consultee for planning matters relating to surface water drainage, therefore it is recommended they should be consulted separately regarding this.

Surface water discharge from new development should ideally 'mimic' the pre-development situation using a sustainable drainage system so that the flow and volume of water in watercourses is not increased.

A permit may be required, under the Environmental Permitting Regulations 2016 from the Environment Agency for any proposed works or structures in, under, over or within eight metres of a 'main river' (e.g., a new outfall). A permit is separate to and in addition

to any planning permission granted. Further details and guidance are available on the GOV.UK website: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits

Risk of Flooding from Reservoirs Map

Outlines and simplified depth and velocity maps can be viewed on our website:

https://flood-warning-information.service.gov.uk/long-term-flood-risk/#x=438988&y=406600&scale=2

Please, zoom into the location of interest, and then click on the inundated location for details. As a result a list of reservoirs will be provided with supporting information and a links to other data, such as estimated depths and speed of flooding, at the bottom of the result page.
A map of showing the outlines can also be provided on request.

Flood Warning

The site may be covered by a Flood Warning. To register to receive this service, you can call Floodline 24 hours a day on 0845 988 1188.

LIDAR Data

Please note that our LiDAR data is now available free of charge (Open Data) from https://environment.data.gov.uk/survey (once zoomed to the relevant location the available LiDAR products will be listed below the map).

Two LIDAR products are available:

1. Tiled LIDAR data - The full tiled dataset consists of historic LIDAR data which has been gathered since 1998. For some areas we have carried out repeat surveys and data is available in a range of resolutions.
2. Composite LIDAR data - The composite dataset is derived from a combination of our full tiled dataset which has been merged and re-sampled to give the best possible spatial coverage.

Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. This technique results in the production of an accurate, cost-effective terrain model suitable for assessing flood risk and other environmental applications.
The Environment Agency owns two LIDAR systems, which are installed in a survey aircraft along with its other operational remote sensing instruments.
The aircraft is positioned and navigated using Global Positioning System (GPS) corrected to known ground reference points. The aircraft typically flies at a height of about 800 metres above ground level and a scanning mirror allows a swath width of about 600 metres to be surveyed during a flight.

The Rights & Responsibilities of a Riverside Owner

The owner of property adjacent to a watercourse is usually deemed to be the riparian owner and, as such, has both riparian rights and responsibilities with regard to the watercourse within their ownership.

For more information on Rights and Responsibilities of a riverside owner, you can visit our website at:

https://www.gov.uk/guidance/owning-a-watercourse

Ordnance Survey Data

Under the terms of our licence agreement with the Ordnance Survey, we are unable to supply the OS data. Under this agreement we can only supply OS data to consultants/contractors carrying out work on our behalf.

Planning advice for developers – FAQs

Introduction

Local planning authorities (LPAs) across Yorkshire are required to consult us on certain planning applications which affect flood risk, groundwater, waste, or water quality.

If your development falls into one of these categories, we'll be invited to comment on your planning application. Your LPA, when considering your application, will take our comments into account.

We've produced this guidance to summarise the environmental issues we're responsible for. The guidance forms part of our free advice service; if you require site-specific or face-to-face advice, we'll need to recover our costs through our charged advice service. Engaging with us early can help you identify the big issues, reduce the chances of subsequent delays and help you design a more sustainable and attractive development.

Development and flood risk

Is my development proposal at risk of flooding?

The flood map for planning shows where flooding from rivers and the sea may occur. Whilst this map isn't suitable for a detailed flood risk assessment, it'll show which flood zone your development is located within and therefore will indicate whether further assessment is needed. You should also refer to your LPA's strategic flood risk assessment which will provide additional local information on flood risk, including the location of functional floodplain and areas which are susceptible to other sources of flooding such as from surface water or reservoirs.

Will my application need to pass the sequential and exception tests?

Local planning authorities apply the sequential test to steer development towards areas at the lowest risk of flooding. If your proposal is located within flood zones 2 or 3, you should contact your LPA to discuss the sequential test **before** submitting your application. The LPA may require you to submit information with your application in support of the sequential test.

If the LPA confirm that the sequential test has ruled out steering the development to lower risk sites, the development may also need to pass the exception test by demonstrating that its sustainability benefits outweigh flood risk and that it can be made safe for its lifetime, through the production of a site-specific flood risk assessment. Planning practice guidance advises when an exception test will be required, which will depend on the vulnerability of the development and the flood zone it lies within.

Do I need to submit a flood risk assessment with my planning application?

You'll need to submit a flood risk assessment if your application lies within flood zones 2 or 3 or is over 1 hectare within flood zone 1. You'll also need to submit an assessment if your proposal could be affected by sources of flooding other than from rivers or the sea. For certain lower risk applications, we've provided 'flood risk standing advice' which enables local planning authorities to assess flood risk assessments without the need to consult us.

What information should I include in my flood risk assessment?

We recommend that you refer to the checklist for a site-specific flood risk assessment for detailed advice on what to include in your flood risk assessment. Alongside referring to your LPA's strategic flood risk assessment, you should contact your LPA to find out whether there are any development guidelines which are specific to your locality.

Can I undertake my own flood risk assessment?

Your FRA must be appropriate to the scale, nature and location of the development whilst being credible and fit-for-purpose. Whilst it's possible to undertake your own assessment, most applicants employ suitably experienced professionals. We're not able to recommend specific consultants, but a simple web search should help you source a competent individual or company.

Do I need to consider how climate change will affect my proposal's flood risk?

Yes, you should demonstrate how flood risk will be managed now and over the development's lifetime, taking climate change into account. Please refer to the following guidance when undertaking your flood risk assessment. In some cases we'll hold the climate change flood data you need. In others you'll need to undertake your own analysis to understand the impacts.

Where can I get modelled or historic flood levels from?

Email our Customers and Engagement team (neyorkshire@environment-agency.gov.uk) to find out whether we have any modelled or historic flood levels available for your development site. A list of the packages of information we're able to provide can be found under the 'get information to complete an assessment' section of the planning practice guidance. They'll aim to provide this information within 20 days. We no longer charge for providing this information.

The risk portrayed by your flood map doesn't seem to reflect the site's actual risk. How do I 'challenge' your flood map?

If you have evidence suggesting that our flood map is inaccurate, please contact our Customers and Engagement team (neyorkshire@environment-agency.gov.uk) who will provide you with any existing data we hold. To formally contest our flood zones, you'll need to submit supporting evidence, such as digital copies of a topographic survey or modelling for quality assurance purposes. Digital files of the proposed new flood zones in ArcMap or MapInfo format should also be supplied. Any new outline data you submit must conform to our flood zones policy, copies of which are available on request.

Whilst we'll usually be happy to review any topographical survey or model prior to the application being submitted, we would have to recover our costs for this work. In some cases where work to review and update our existing models is already underway, we may decline to consider a challenge.

As we have to be certain that the data which informs our flood map is fit-for-purpose, any revisions will need to meet stringent quality checks.

SURFACE WATER AND DRAINAGE

Who's responsible for managing surface water?

Lead local flood authorities are responsible for providing advice on the management of surface water resulting from new major development. Internal drainage boards, where established, have permissive powers to manage water levels within their drainage districts, so also play a key role in managing surface water.

Will I need to provide surface water storage and limit the discharge rate?

You should contact your lead local flood authority to discuss surface water discharge rates and storage requirements. Typically, they'll ask that your development does not increase run-off and limits the discharge to the existing greenfield run-off rate (usually 1.4l/s/ha if not calculated).

Do I need to install sustainable drainage systems?

Sustainable Drainage Systems (SuDS) should always be carefully considered in discussion with your lead local flood authority. A SuDS scheme can reduce flood risk, improve water quality, create better habitats for wildlife, and produce pleasant, more amenable places for people.

Infiltration drainage must not, however, pose a risk to groundwater quality. All infiltration SuDS must:

- Meet the groundwater protection criteria set out on GOV.UK
- Not be constructed in ground affected by contamination

Who should I contact about connecting my development to the mains sewer?

Talk to your water company about connecting to their sewerage system. Here are some contact details for water companies operating in the Yorkshire Environment Agency area:

Yorkshire Water	planningconsultation@yorkshirewater.co.uk
Northumbrian Water	developmentenquiries@nwl.co.uk
Severn Trent Water	new.connections@severntrent.co.uk

My development is a long way from the mains sewer. Can I install a 'non-mains' drainage system, such as a package treatment plant?

New development should connect to the public mains sewer wherever possible. Individual treatment plants can deteriorate local water quality and are more challenging to monitor and regulate. If you can't connect to the mains sewer, your planning submission should outline how you will deal with foul drainage discharge. You should include evidence as to why it is not possible to connect to the mains system, including details of any prohibitive costs. Please note that some 'non-mains' foul water drainage systems will require an environmental permit, irrespective of any planning approval.

OTHER ENVIRONMENTAL CONSIDERATIONS

What other environmental issues will you consider with my planning application?

Your planning application will need to demonstrate that any environmental risks can be managed, through design and construction, for the development's lifetime. Alongside flood risk, the key environmental risks we'll consider are:

- **Land Contamination**
  We're mainly interested in those sites where there is a risk of pollution to controlled waters. You should investigate any contamination to see whether the environmental risk or cost of clean-up (remediation) would hinder your proposal. If contamination is known or suspected, a desktop study, investigation, remediation and other works may be required to enable safe development. Our model procedures for the management of land contamination provide further information.

- **Pollution prevention**
  Your application should demonstrate how you'll minimise the risk of pollution from all aspects of your development, including construction and

operation phases. Groundwater can be vulnerable to pollution, as well as rivers and streams. Some areas (source protection zones and aquifers) are especially sensitive to pollutants as they typically supply public drinking water. To find out whether your development is located in an area sensitive to groundwater pollution, visit our interactive maps. Advice on groundwater protection can be found on GOV.UK

- **Fisheries, biodiversity, geomorphology and protected species**
  If your proposal is likely to affect the ecology of a main river, you'll need to carry out a risk assessment. This assessment should show that your development can proceed without demonstrable harm, and should propose mitigation, compensation or enhancements where required. A survey should be carried out if any protected species are thought to be nearby. If this survey confirms the presence of protected species or their habitat, measures should be taken to manage the development's risks. Natural England are the statutory consultee for other biodiversity-related matters. Further information on their remit can be found on GOV.UK

- **Water framework directive**
  If your proposal affects ground or surface waterbodies, you'll need to consider the Water Framework Directive (WFD) and the actions set out in the Humber River Basin Management Plan. You'll also need to submit a WFD Assessment demonstrating how the development will prevent deterioration and improve the waterbody's ecological status.

- **River buffer zone**
  Your development should ensure that an 8m strip of land (planted with locally appropriate, native species) is left undisturbed next to the bank of any main river. This 'river corridor' will improve habitat connectivity and will ensure we're able to access the bank for any future flood defence construction and maintenance.

- **Culverting**
  We're opposed to culverting. Culverts degrade watercourses' ecology and prevent the movement of wildlife and fish. As culverts can easily become blocked, they increase flood risk. They're also difficult to inspect and maintain. We may object to any planning applications involving culverting on a main river and may refuse to grant an environmental permit. Existing culverts should be removed and the river channel and bankside habitat reinstated to restore the ecological continuity of the river channel and its corridor.

Will I need any other Environment Agency permits for my development?

You might need an environmental permit if your development manages or produces waste or emissions that pollute the air, water or land or is work that affects a main river or a sea defence. The lead local flood authority is responsible for any consents relating to ordinary watercourses.

The Environmental Permitting Regulations (England and Wales) 2015 cover water discharges, groundwater activities, flood risk activities, radioactive substances, waste, mining waste and installations. They also include provision for a number of directives including batteries. Further information, including contact details for further permitting related enquiries, can be found here.

As planning and permitting decisions are often closely linked, we have issued detailed guidance for developments requiring planning permission and environmental permits. This guidance explains how, when responding to planning consultations that require environmental permits, we will advise of three possible positions:

- No major permitting concerns
- More detailed consideration is required and parallel tracking is recommended
- Don't proceed – unlikely to grant a permit.

PRE-APPLICATION ADVICE

Can you provide site-specific advice, review a submission document, or attend a site meeting before I submit my planning application?

We encourage you to seek pre-application advice as it can help you solve key environmental issues early, reduce the chance of an objection and help you design a more sustainable development. If you'd like to take advantage of this service, please email our Sustainable Places team so that we can provide further details and estimated costs.

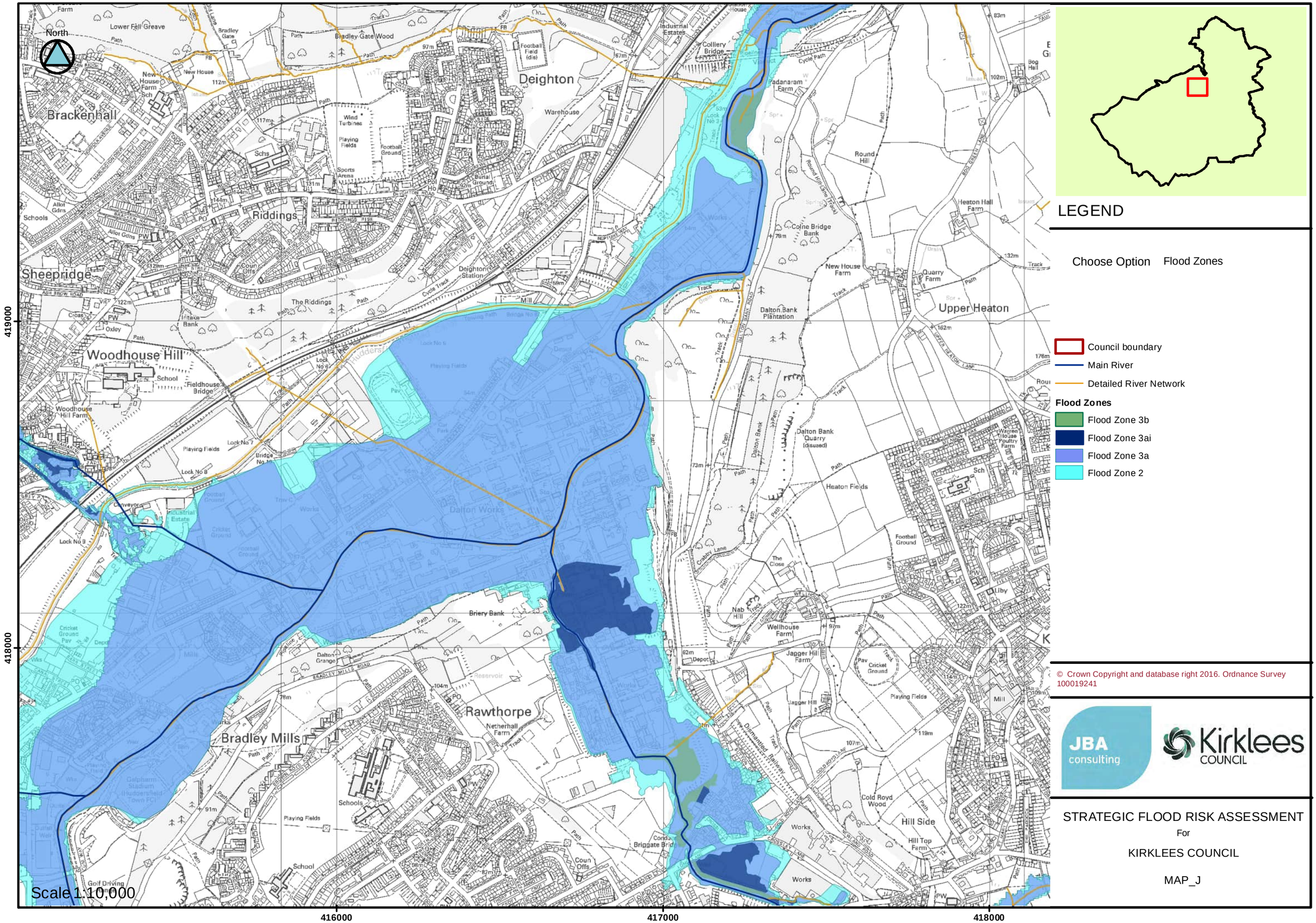
Please note that any pre-application guidance we provide doesn't represent our final view in relation to any future planning application. We recommend that you seek your own expert advice prior to submitting your application.

Who should I contact for further information?

Yorkshire planning enquiries: sp-yorkshire@environment-agency.gov.uk

General enquiries: 03708 506 506

Environment Agency, Lateral, 8 City Walk, Leeds LS11 9AT
https://www.gov.uk/government/organisations/environment-agency



LEGEND

Choose Option Flood Zones

- Council boundary
- Main River
- Detailed River Network

Flood Zones

- Flood Zone 3b
- Flood Zone 3ai
- Flood Zone 3a
- Flood Zone 2

JBA consulting

Kirklees COUNCIL

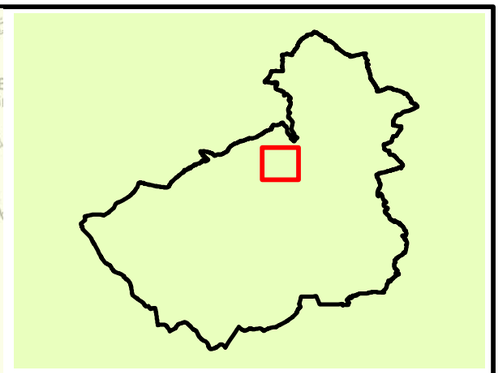
STRATEGIC FLOOD RISK ASSESSMENT

For

KIRKLEES COUNCIL

MAP_J

North



LEGEND

Choose Option

Areas Susceptible to Ground water Flooding

Council boundary

Main River

Detailed River Network

Areas Susceptible to Ground Water Flooding

Risk of Groundwater Emergence

>= 75%

>= 50% <75%

>= 25% <50%

< 25%

JBA consulting

Kirklees COUNCIL

STRATEGIC FLOOD RISK ASSESSMENT

For

KIRKLEES COUNCIL

MAP_J

Scale 1:10,000

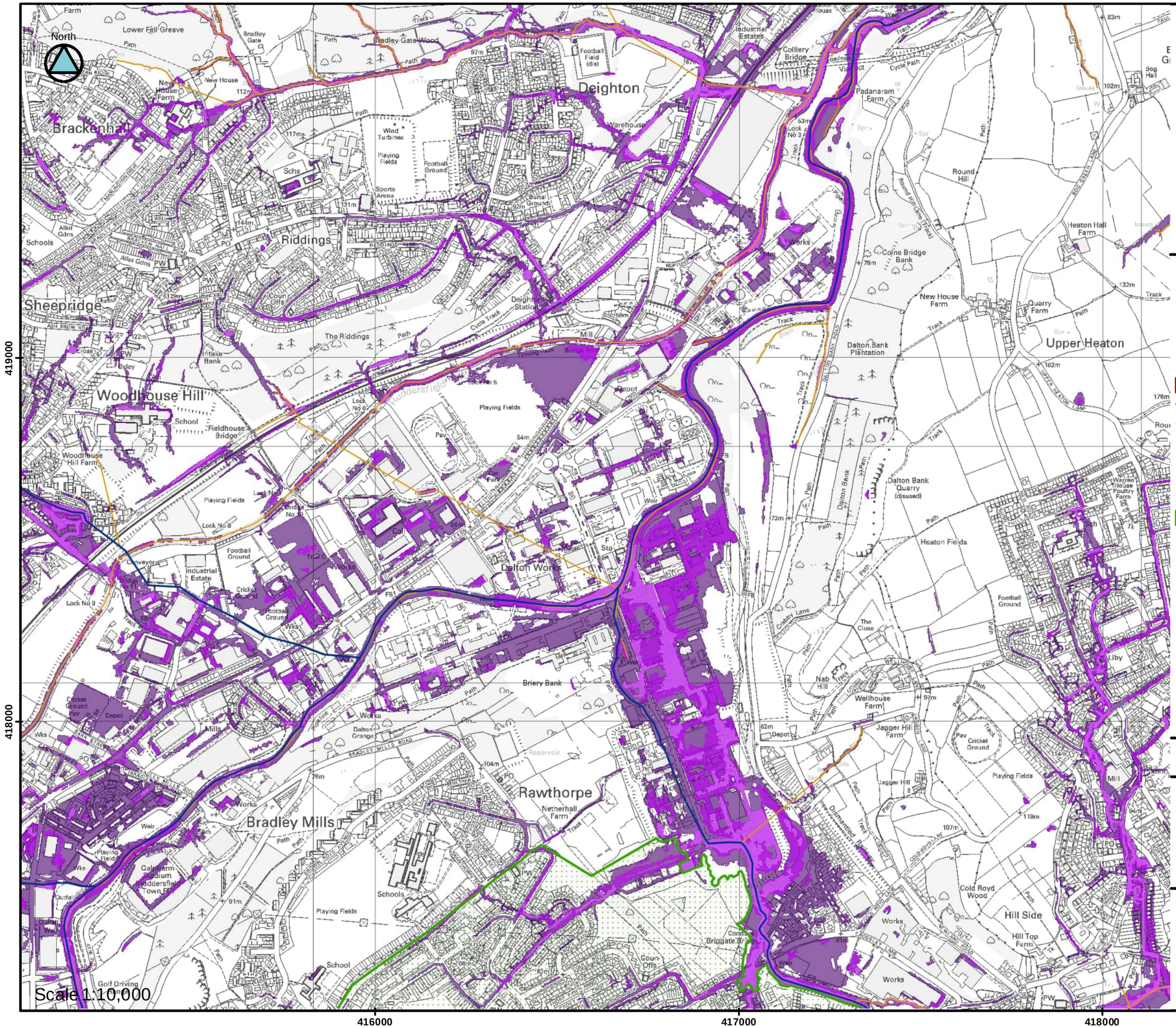
419000

418000

416000

417000

418000



LEGEND

Choose Option

Updated Flood Map for Surface Water

- Council boundary
- Main River
- Detailed River Network

uFMfSW

- 30 year event
- 100 year event
- 1000 year event
- CDA indicative

JBA consulting

Kirklees COUNCIL

STRATEGIC FLOOD RISK ASSESSMENT

For

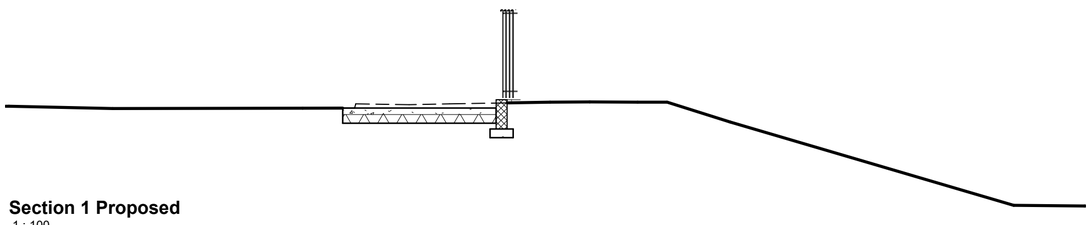
KIRKLEES COUNCIL

MAP_J

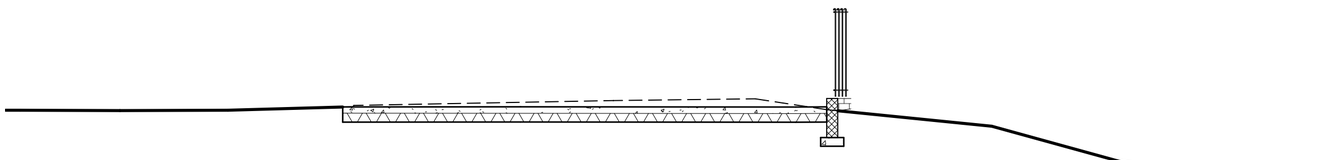
Appendix D

PROPOSED SITE LAYOUT

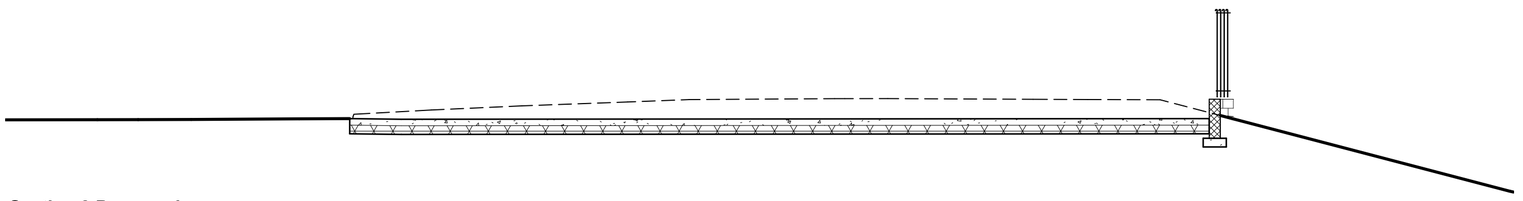
Proposed Full Yard
1 : 150



Section 1 Proposed
1 : 100



Section 2 Proposed
1 : 100



Section 3 Proposed
1 : 100

Rev	Description	Drawn	Checked	Date
P3	Revised to suit client comments	MJR		29-10-24
P2	Issued to client for comments	MJR		28-10-24
P1	FIRST DRAFT	MJR		14-10-24

Document Status : **S2**

Purpose of Issue: **FOR DISCUSSION**

MARTIN WALSH ARCHITECTURAL
Firth Buildings, 99 - 103 Leeds Rd, Dewsbury, WF12 7BU t: 01924 464342
e: info@martinwalsh.co.uk w: www.martinwalsh.co.uk

Project
Proposed canopy and extend existing yard
Lubrizol Limited, Syngenta, Leeds Road, Huddersfield, HD2 1YU

Title
Proposed Site Plan

Client
Lubrizol Limited

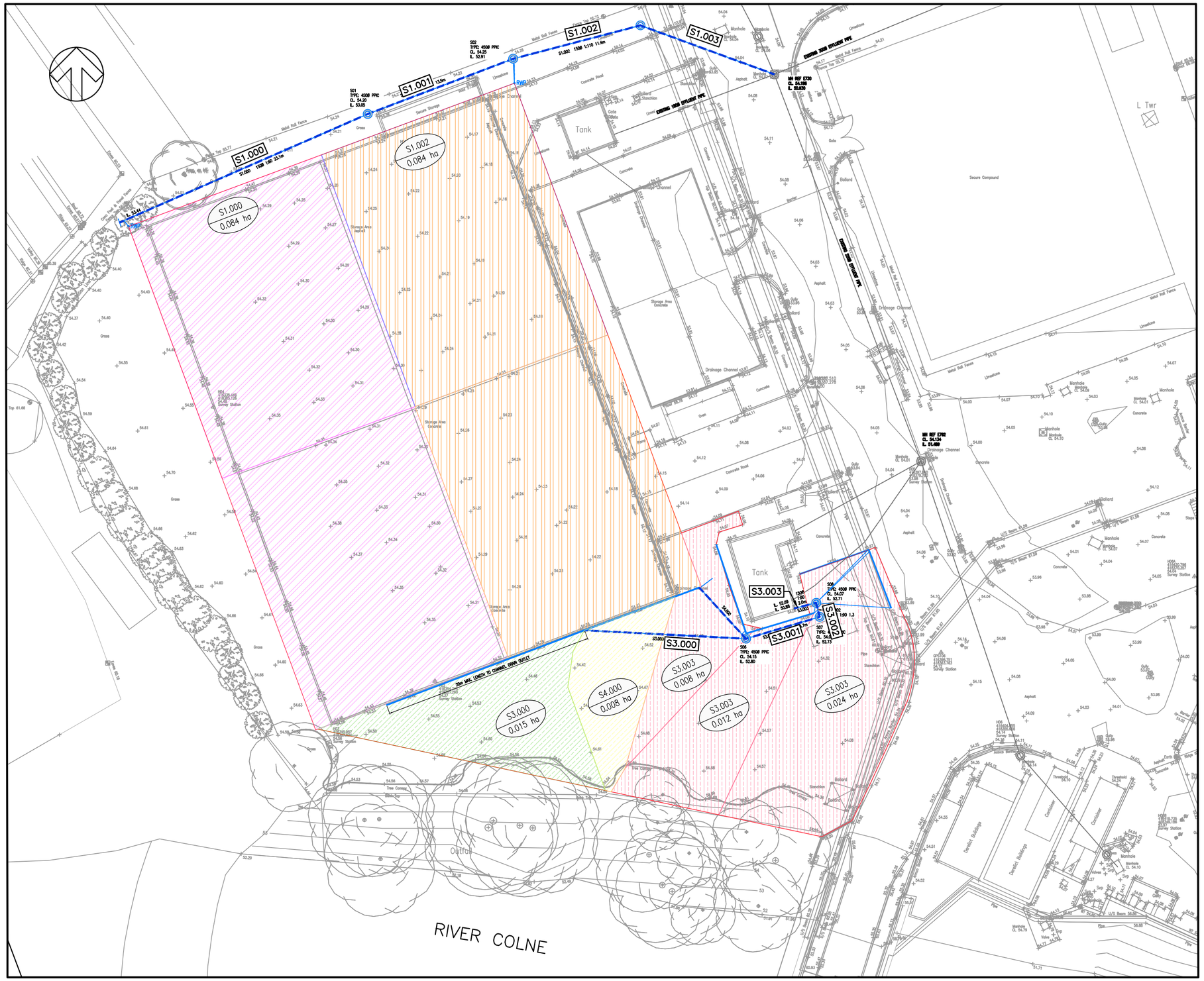
MWA Project No.	Scale	Original Paper Size	Paper Orientation	Drawn
6640	As indicated	@A1	Portrait	MJR

File Identifier

Project	Originator	Volume	Level	Type	Role	Number	Revision
LULR -	MWA -	XX -	XX -	DR -	A -	0005	P3

Appendix E

DRAINAGE CATCHMENT PLAN, DRAINAGE LAYOUT AND FLOOD EXCEEDANCE PLAN



DO NOT SCALE

NOTES

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETRES AND ALL LEVELS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.
2. THIS DRAWING IS IN THE DEVELOPMENT STAGE AND IS SUBJECT TO CHANGE.
3. THIS DRAWING IS BASED ON THE FOLLOWING INFORMATION:
   - TOPOGRAPHICAL SURVEY REF MWA_221_LUBRIZOL DATED JULY 2020 BY HOLDEN SURVEYS LTD.
   - EXISTING DRAINAGE REF H/A3/122372 FROM SYNGENTA
   - PROPOSED ARCHITECTS SITE PLAN BY MARTIN WALSH ARCHITECTURAL.
4. PROPOSED IMPERMEABLE AREAS MEASURED FROM THE SITE LAYOUT SUPERIMPOSED ON THE TOPO SURVEY.

KEY

1.001 / 0.0590 ha — PIPE REFERENCE; IMPERMEABLE AREA DRAINED (HECTARES)

EXISTING IMPERMEABLE AREA (CONCRETE SLAB HARDSTANDING)	1680m²
NEW IMPERMEABLE AREA (EXTENDED YARD) (PREVIOUSLY UNDEVELOPED AREA)	670m²
TOTAL SITE IMPERMEABLE AREA	2350m²

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	20/12/2024	GO	FIRST ISSUE	VF	DV

DRAWING STATUS: S2 - FOR INFORMATION

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wsp.com

CLIENT:

ARCHITECT: MARTIN WALSH ARCHITECTURAL

PROJECT: LUBRIZOL LTD, HUDDERSFIELD

TITLE: DRAINAGE CATCHMENT AREA PLAN

SCALE @ A2:	CHECKED:	APPROVED:
1:250	VF	DV

PROJECT No:	DESIGNED:	DRAWN:	DATE:
70124016		GO	December 24

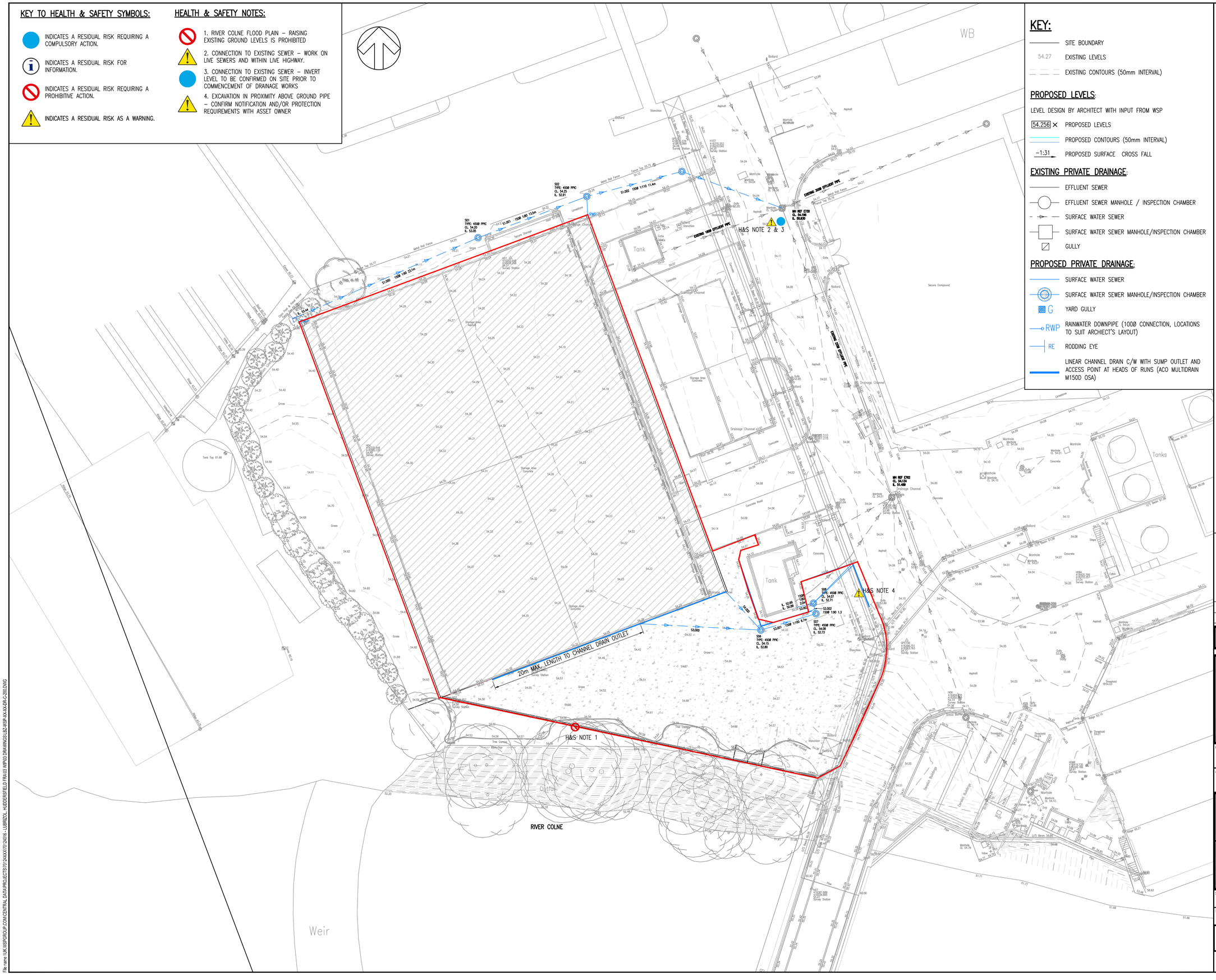
DRAWING No:	REV:
LBZ-WSP-XX-XX-DR-C-100	P01

KEY TO HEALTH & SAFETY SYMBOLS:

- INDICATES A RESIDUAL RISK REQUIRING A COMPULSORY ACTION.
- INDICATES A RESIDUAL RISK FOR INFORMATION.
- INDICATES A RESIDUAL RISK REQUIRING A PROHIBITIVE ACTION.
- INDICATES A RESIDUAL RISK AS A WARNING.

HEALTH & SAFETY NOTES:

1. RIVER COLNE FLOOD PLAIN – RAISING EXISTING GROUND LEVELS IS PROHIBITED
2. CONNECTION TO EXISTING SEWER – WORK ON LIVE SEWERS AND WITHIN LIVE HIGHWAY.
3. CONNECTION TO EXISTING SEWER – INVERT LEVEL TO BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF DRAINAGE WORKS
4. EXCAVATION IN PROXIMITY ABOVE GROUND PIPE – CONFIRM NOTIFICATION AND/OR PROTECTION REQUIREMENTS WITH ASSET OWNER



KEY:

- SITE BOUNDARY
- 54.27 EXISTING LEVELS
- EXISTING CONTOURS (50mm INTERVAL)

PROPOSED LEVELS:

LEVEL DESIGN BY ARCHITECT WITH INPUT FROM WSP

- 54.256 × PROPOSED LEVELS
- PROPOSED CONTOURS (50mm INTERVAL)
- -1:31 PROPOSED SURFACE CROSS FALL

EXISTING PRIVATE DRAINAGE:

- EFFLUENT SEWER
- EFFLUENT SEWER MANHOLE / INSPECTION CHAMBER
- SURFACE WATER SEWER
- SURFACE WATER SEWER MANHOLE/INSPECTION CHAMBER
- GULLY

PROPOSED PRIVATE DRAINAGE:

- SURFACE WATER SEWER
- SURFACE WATER SEWER MANHOLE/INSPECTION CHAMBER
- G YARD GULLY
- RWP RAINWATER DOWNPIPE (100Ø CONNECTION, LOCATIONS TO SUIT ARCHIECT'S LAYOUT)
- RE RODDING EYE
- LINEAR CHANNEL DRAIN C/W SUMP OUTLET AND ACCESS POINT AT HEADS OF RUNS (ACO MULTIDRAIN M150D OSA)

DO NOT SCALE

NOTES:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETRES, ALL LEVELS ARE SHOWN IN METRES.
2. THIS DRAWING IS BASED ON THE FOLLOWING INFORMATION:
   - TOPOGRAPHICAL SURVEY REF MWA_221_LUBRIZOL DATED 14 JULY 2020 FROM HOLDEN SURVEYS LTD.
   - ARCHITECT'S PROPOSED SITE PLAN REF LLLR-MWA-XX-XX-DR-A-0005.
   - EXISTING DRAINAGE REF H/A3/122372 FROM SYNGENTA
   - DRAINAGE DESIGN BASED ON FLOOD RISK ASSESSMENT REF LBZ-WSP-XX-ZZ-RP-C-001 DATED DECEMBER 2024 BY WSP.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT WSP AND ARCHITECTS DRAWINGS AND PROJECT SPECIFICATIONS.
4. RAINWATER PIPES – ALL CONNECTIONS FROM RWP'S TO BE 100Ø 1:60 MIN WITH CLASS Z BEDDING UNO. RWP'S ARE SHOWN INDICATIVELY, FOR EXACT LOCATIONS REFER TO ARCHITECTS DETAILS.
5. THRESHOLD DRAINS – WHERE REQUIRED, CHANNEL DRAIN TO BE PROVIDED ACROSS DOORWAYS IN–LINE WITH ARCHITECTS DETAILS AND CONNECTED WITH 100Ø OUTLET TO NEAREST AVAILABLE SURFACE WATER DRAIN WITH JUNCTION OR DIRECT TO MANHOLE/INSPECTION CHAMBER.
6. ALL BUILDING DRAINAGE WORKS CARRIED OUT IN ACCORDANCE WITH BS EN:752 DRAINAGE AND SEWER SYSTEMS OUTSIDE BUILDING, THE CURRENT BUILDING REGULATIONS AND THE LOCAL AUTHORITY BUILDING CONTROL SPECIFICATIONS AND REQUIREMENTS.
7. THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINS/SEWERS AND SERVICES SHALL BE ESTABLISHED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS ON SITE. ANY DISCREPANCIES FROM THE INFORMATION INDICATED ON THESE DRAWINGS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
8. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND DIVERSION WORKS AS NECESSARY, TO ALL EXISTING SERVICES TO THE SATISFACTION OF THE PUBLIC UTILITIES.
9. THE CONTRACTOR SHALL ALLOW FOR TRENCH SUPPORT AND DEALING WITH SURFACE WATER RUN–OFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF SUMPS, PUMPING AND DE–WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
10. ALL LEVELS AND DIMENSIONS SHALL BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ANY DISCREPANCIES SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS IN LINE WITH CURRENT LEGISLATION WHEN WORKING IN/NEAR CONFINED SPACES, DEEP EXCAVATIONS AND MACHINERY.
12. PIPE MATERIAL UP TO 300mm DIA IS VITRIFIED CLAY OR UPVC. CLASS S BED & SURROUND TO BE USED WHERE COVER TO PIPE IS GREATER THAN 1.2m IN CARRIAGEWAY OR 0.9m IN PUBLIC OPEN SPACE, OTHERWISE CONCRETE PROTECTION WILL BE REQUIRED. REFER TO STANDARD CONSTRUCTION DETAILS.

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	20/12/2024	GO	FIRST ISSUE	VF	DV

DRAWING STATUS: S2 - FOR INFORMATION

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wsp.com

CLIENT: LUBRIZOL LIMITED

ARCHITECT: MARTIN WALSH ARCITECTURAL

SITE/PROJECT: PROPOSED WAREHOUSE & STORAGE YARD SYNGENTA COMPLEX, LEEDS ROAD, HUDDERSFIELD HD2 1YU

TITLE: PROPOSED DRAINAGE LAYOUT

SCALE @ A1:	CHECKED:	APPROVED:
1:200	VF	DV

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
70124016		GO	December 24

DRAWING No: LBZ-WSP-XX-XX-DR-C-200 REV: P01

File name: \\UK.WSPGROUP.COM\CENTRAL DATA\Projects\70124XXX\70124016 - LUBRIZOL, HUDDERSFIELD FRA\03 WIP\03 DRAWINGS\LBZ-WSP-XX-XX-DR-C-200.DWG

ALL EXCEEDANCE FLOWS FROM SITE DIRECTED THE ROAD. PONDING WILL OCCUR IN ROAD JUNCTION WHEN EXISTING SURFACE WATER SEWER NETWORK CAPACITY IS EXCEEDED WITHOUT CAUSING HARM TO PEOPLE OR DAMAGE TO PROPERTY.

PONDING AGAINST BUNDING UNTIL DEPTH REACHED FOR EXCEEDANCE FLOWS AROUND TANK

POTENTIAL EXCEEDANCE FLOW INTO BUILDING. DESIGNED FOR FREE FLOW OF FLOOD WATERS INTO BUILDING TO AVOID DISPLACING FLOOD STORAGE VOLUME. REFER TO WSP FLOOD RISK ASSESSMENT FOR DETAILS.

LOW POINT IN RIVER BANK. POTENTIAL OVERTOPPING POINT WITH FLUVIAL FLOODING TO SITE

RIVER COLNE

DO NOT SCALE

NOTES:

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2. THIS DRAWING IS BASED ON THE FOLLOWING INFORMATION:
   - TOPOGRAPHICAL SURVEY REF MWA_221_LUBRIZOL DATED 14 JULY 2020 FROM HOLDEN SURVEYS LTD.
   - ARCHITECT'S PROPOSED SITE PLAN REF LLLR-MWA-XX-XX-DR-A-0005.
   - EXISTING DRAINAGE REF H/A3/122372 FROM SYNGENTA
   - DRAINAGE DESIGN BASED ON FLOOD RISK ASSESSMENT REF LBZ-WSP-XX-ZZ-RP-C-001 DATED DECEMBER 2024 BY WSP.

KEY:

- EXCEEDANCE FLOW ROUTE
- 54.27 EXISTING LEVELS
- EXISTING CONTOURS (50mm INTERVAL)
- SITE BOUNDARY

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK

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DRAWING STATUS: S2 - FOR INFORMATION

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wsp.com

CLIENT: LUBRIZOL LIMITED

ARCHITECT: MARTIN WALSH ARCITECTURAL

SITE/PROJECT: PROPOSED WAREHOUSE & STORAGE YARD SYNGENTA COMPLEX, LEEDS ROAD, HUDDERSFIELD HD2 1YU

TITLE: OVERLAND FLOW EXCEEDANCE PLAN

SCALE @ A1:	CHECKED:	APPROVED:
1:200	VF	DV

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
70124016		GO	December 24

DRAWING No: LBZ-WSP-XX-XX-DR-C-300 REV: P01

First Floor
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