FLOOD RISK ASSESSMENT

& DRAINAGE STRATEGY

FOR

PROPOSED OUTDOOR MOTORSPORT FACILITY

AT

CARR HALL

WHALLEY ROAD

LANGHO

BB1 9NB

ON BEHALF OF

DONELAN TRADING LIMITED

July 2022

CONTENTS

1.0 INTRODUCTION

[redacted] is appointed by Donelan Trading Limited to undertake a Flood Risk Assessment in support of a planning application for a proposed electric quad outdoor motorsport facility with support building and car parking at Carr Hall, Whalley Road, Langho, BB1 9NB.

This Flood Risk Assessment is generally based on the guidance contained in The National Planning Policy Framework, and Flood Risk & Coastal Change.

This report also considers a drainage strategy for the proposal in accordance with the National Planning Policy Framework and Building Regulations Approved Document H3 in respect of foul and surface water drainage of the site.

2.0 EXISTING SITE

2.1 Site Location

The application site is centred on NGR 370080, 433340N and is located approximately midway between the villages of Wilpshire and Langho, on the land to the south-east of Whalley Road [A666].

A location plan is contained in Appendix A to this report.

2.2 Site Description & Topography

The majority of the site comprises established woodland with a smaller area of stoned-up hardstanding at the southern end of the red-edged land.

A recent aerial image is contained in Appendix B to this report.

The access/egress for the land is along an existing access road to Carr Hall from Whalley Road.

The red-edged application boundary occupies a total area of approximately 2.94 Ha including the access road.

An open watercourse runs along the western boundary of the wooded area. The site is generally fenced from the surrounding area which comprises permanent open pasture land.

The woodland slopes steeply from east to west with general ground levels varying between approximately 154m AOD in the south-eastern corner to approximately 131m

AOD in the north-western corner of the wooded section of the site. A number of distinct dry ditches or gullies are located across the site following the slope of the land and terminating at the watercourse on the western site boundary. One of these, located in the northern third of the woodland, is indicated as a watercourse on Ordnance Survey mapping.

The existing hardstanding area to the south of the woodland is made up of a number of terraced plateaux again falling generally from east to west.

There are currently no buildings within the red-edged application boundary.

A Topographical Survey of the site is contained in Appendix C to this report.

2.3 Area and Existing Site Drainage

The site lies at the western extent of the River Calder [Main River] catchment within the Ribble Management Catchment of the North West River Basin District.

Carr Hall is close to the southern end of the sub-catchment of Bushburn Brook with a catchment area of approximately 7.72km^2 which flows into the River Calder approximately 3.5km north-east of the site, 1.8km west of Whalley village.

The existing watercourse which runs past Carr Hall and along the western site boundary is an unnamed tributary of Bushburn Brook.

One of the existing dry ditches crossing the site within the woodland area, is indicated as a watercourse on Ordnance Survey mapping.

2.4 Ground Conditions

BGS mapping indicates the underlying geology as being Superficial Deposits of Devensian Glacial Till (Diamicton), generally described as firm-stiff sandy silty gravelly clay and very compact clay silty gravelly sand, over bedrock comprising Pendle Grit Member Sandstone.

Soil mapping from "Soilscapes" web-site by [redacted] confirms the soil type to the north-west of the site on the opposite side of the boundary watercourse as "Slowly permeable, seasonally wet acid loamy and clayey soils" draining to stream network, whereas under the application site the soil type is described as "Freely draining slightly acid loamy soils" draining to local groundwater and rivers.

Extracts from this mapping is contained in Appendix D to this report.

3.0 EXISTING FLOOD RISK

3.1 Risk of Flooding from Rivers & Sea [Fluvial & Tidal]

Flood Zone definitions refer to the probability of river and sea flooding, ignoring the presence of any defences and are defined as follows:

Flood Zone 1 - *Land having a less than 1 in 1000 annual probability of flooding from fluvial or tidal sources in any year [<0.1%];*

Flood Zone 2 - *Land having between a 1 in 100 and 1 in 1000 annual probability of flooding from fluvial sources in any year [1% - 0.1% AEP]; or land having between a 1 in 200 and 1 in 1000 annual probability of flooding from tidal sources in any year [0.5% - 0.1% AEP];*

Flood Zone 3 - *Land having a 1 in 100 or greater annual probability of flooding from fluvial or tidal sources in any year [>1% AEP]; or land having a 1 in 200 or greater annual probability of flooding from tidal sources in any year [>0.5% AEP].*

The red-edged application site is located entirely in Flood Zone 1.

Additional Environment Agency Long Term Flood Risk mapping [Flood Risk from Rivers or the Sea] defines flood risk to an area as follows:

High Risk	*Chance of flooding of greater than 3.3% each year;*
Medium Risk	*Chance of flooding of between 1% and 3.3% each year;*
Low Risk	*Chance of flooding of between 0.1% and 1.0 each year;*
Very Low Risk	*Chance of flooding of less than 0.1% each year.*

These definitions take into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

This mapping shows the site to be in an area of Very Low Risk.

Copies of the Flood Map for Planning and Environment Agency Long-Term Flood Risk mapping are contained in Appendix E to this report.

3.2 Risk of Flooding from Surface Water [Pluvial]

Environment Agency Long-term Flood Risk mapping indicates that the site itself is not at risk of flooding from surface water.

However, a line of high risk of surface water flooding is shown around the southern and western site boundaries but this represents and is restricted to the location of the adjacent watercourse within a distinct channel, and as such is not considered to present a risk to the development site.

Copies of the Long-term Flood Risk maps are contained in Appendix E to this report.

3.3 Risk of Flooding from Sewers

There are no public combined, foul or surface sewers crossing, or with close proximity to the site, and no reports of sewer flooding affecting the surrounding area are reported by United Utilities, and consequently, risks from this source are considered negligible.

3.4 Risk of Flooding from Groundwater

BGS mapping indicates the drift and soil on the site to be firm-stiff sandy silty and gravelly clays which are slowly permeable.

However, soil mapping from "Soilscapes" web-site [redacted] confirms the soil type under the land to be freely draining soils, although the site is close to the edge of an area described as slowly permeable clayey soil.

However, given the presence of a watercourse in a distinct channel along the western site boundary, and the slope of the land towards this feature, flood risk from this source is considered to be negligible.

3.5 Risk of Flooding from Reservoirs and Other Water Bodies

Environment Agency Long-term Flood Risk mapping indicates that the site is not within an area at potential risk of flooding from reservoirs.

Copies of the Long-term Flood Risk maps are contained in Appendix E to this report.

There are no canals or, with the exception of the watercourses and gullies identified previously, other artificial water bodies in the proximity of the site, and so flood risk from this source is considered negligible.

4.0 PROPOSED DEVELOPMENT

The planning application relates to the provision of and off-road driving track through the existing woodland area for the sole use of electric-powered quad bikes. In addition, it is proposed to form a small car parking area with permeable gravel surfacing, a training and maintenance yard and erect a two-storey building housing a reception, toilets, changing rooms and storage, along with peripheral green-space landscaping.

The driving tracks will be formed through the existing trees within the woodland on natural ground, and no new impermeable surfacing will be laid to create these tracks.

Access into the site will be maintained unchanged along the existing private road serving Carr Hall off Whalley Road.

A copy of the proposed site layout is contained in Appendix F to this report.

4.1 Vulnerability

Flood Risk and Coastal Change guidance, Table 2 identifies the main elements of the proposed development as being Water Compatible, although the car parking area and any storage within the proposed building can be described as a Less Vulnerable development.

From Table 3: Flood risk vulnerability and flood zone compatibility, both those land use classifications are considered as appropriate in Flood Zone 1.

5.0 FUTURE FLOOD RISK

5.1 Climate Change

The NPPF sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. This includes demonstrating how flood risk will be managed now and over the development's lifetime, taking climate change into account.

The assessment of future flood risk to the site takes into account climate change guidance given in "Flood Risk Assessments: Climate Change Allowances" published by The Environment Agency in February 2016 and updated in May 2022.

The selection of climate change allowance should reflect the lifespan of the proposed development. This amenity leisure development could be considered to have a lifetime of 20-25 years and thus, the 2050's Epoch figures apply on both river flow and rainfall intensity climate change allowances.

As a "water compatible" or "less vulnerable" development in Flood Zone 1 situated in the Ribble Management Catchment of the North West River Basin District, the Central Peak River Flow Climate Change Allowance of 23% should be considered.

Furthermore, when calculating future surface water run-off from the site, the Central Climate Change Allowance figure for both the 3.3% & 1.0% AEP events of 25% on rainfall intensities should be considered.

5.2 Drainage Strategy

In accordance with the National Planning Policy Framework surface water drainage from the site should be considered in the most sustainable way in accordance with the following hierarchical approach:

- Into the ground (infiltration);
- To a surface water body;
- To a surface water sewer, highway drain, or another drainage system;
- To a combined sewer.

Peak surface water run-off from new hard standing areas not being drained by infiltration into the ground will be collected by rainwater harvesting for re-use on the site, and any excess flows will be restricted by attenuation to Greenfield run-off rates, or to no more than existing discharge rates reduced by a 30% betterment figure and taking into account the appropriate climate change allowances set out in Section 5.1 above, and drain into the adjacent watercourse.

6.0 MITIGATION MEASURES

As the site is located in Flood Zone 1 and is considered at negligible risk of flooding from other sources, no specific flood mitigation measures, such as emergency refuges & escape plans, flood resilience or flood resistance, are required to reduce flood risk to the site.

However, as a practical measure, the new building will be set at least 150mm above the adjacent proposed ground level which should in turn be laid to falls away from the building.

Any new hard standing and roof areas will be drained either by infiltration into the ground or attenuated to greenfield run-off rates into the adjacent watercourse and thus, will not increase flood risk to others.

7.0 CONCLUSION

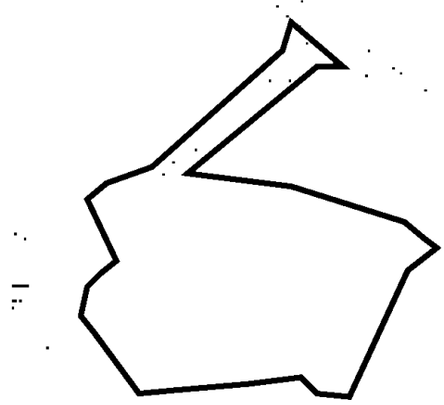
Environment Agency's Flood Map for Planning indicates that the site is located within Flood Zone 1 and is considered as "appropriate" given its Vulnerability Classifications.

The site is considered to be at negligible risk from flooding from all other sources.

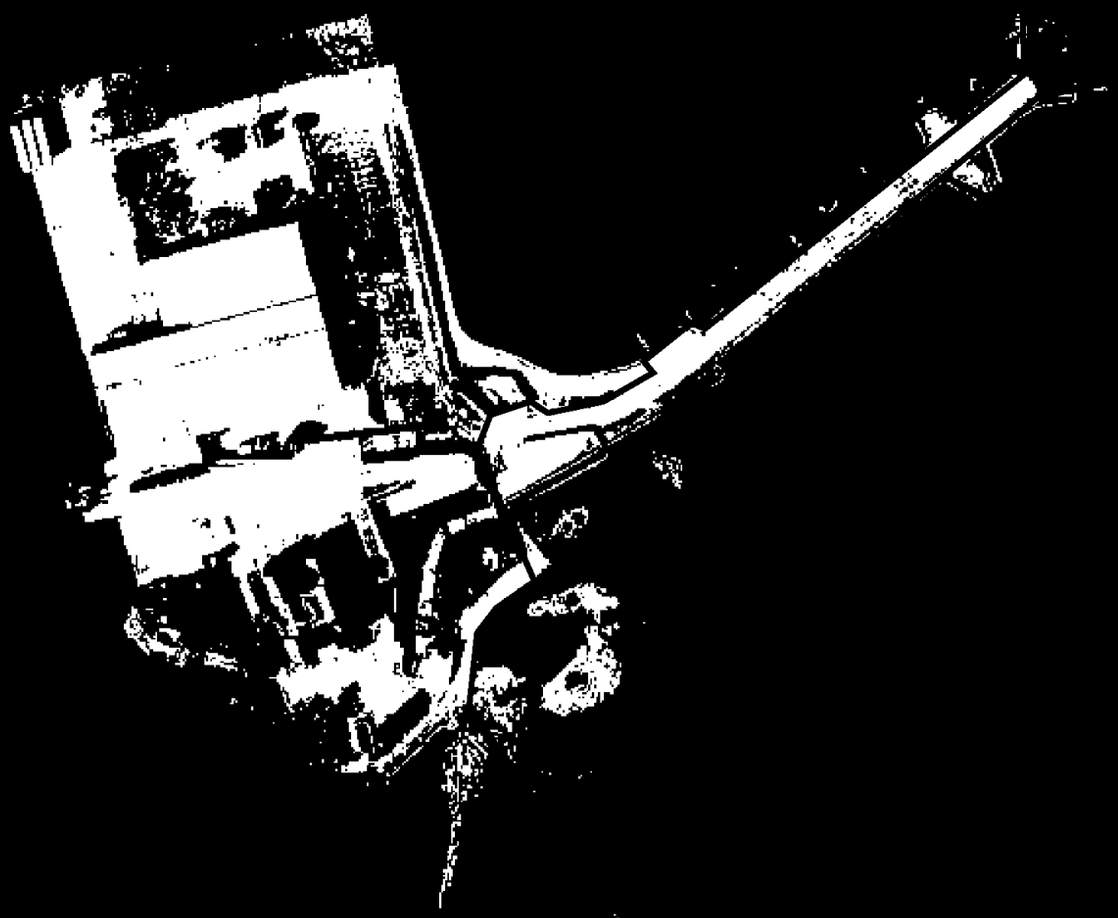
It is proposed to drain surface water from the development in accordance with the preferred hierarchy of options, taking into to account the effects of climate change as required.

Based on the above, the proposal will not increase flood risk elsewhere.

APPENDIX A - Location Plan



APPENDIX B - Aerial Image



APPENDIX C - Topographical Survey

NORTH

WHALLEY ROAD

PRIVATE ACCESS ROAD TO CARR HALL

Carrwood

Kalguril

Newby

Issues

Path (um)

SF-TO 1			
Number	Easting	Northing	Height
M1A	370096.059	433222.324	144.354
M1B	370051.095	433246.993	140.741
WA1	370006.105	433309.711	135.418

EXISTING SITE PLAN
SCALE 1.500 A1

BRAMLEY - PATE + PARTNERS
Chartered Architects - Telephone (01772) 335357

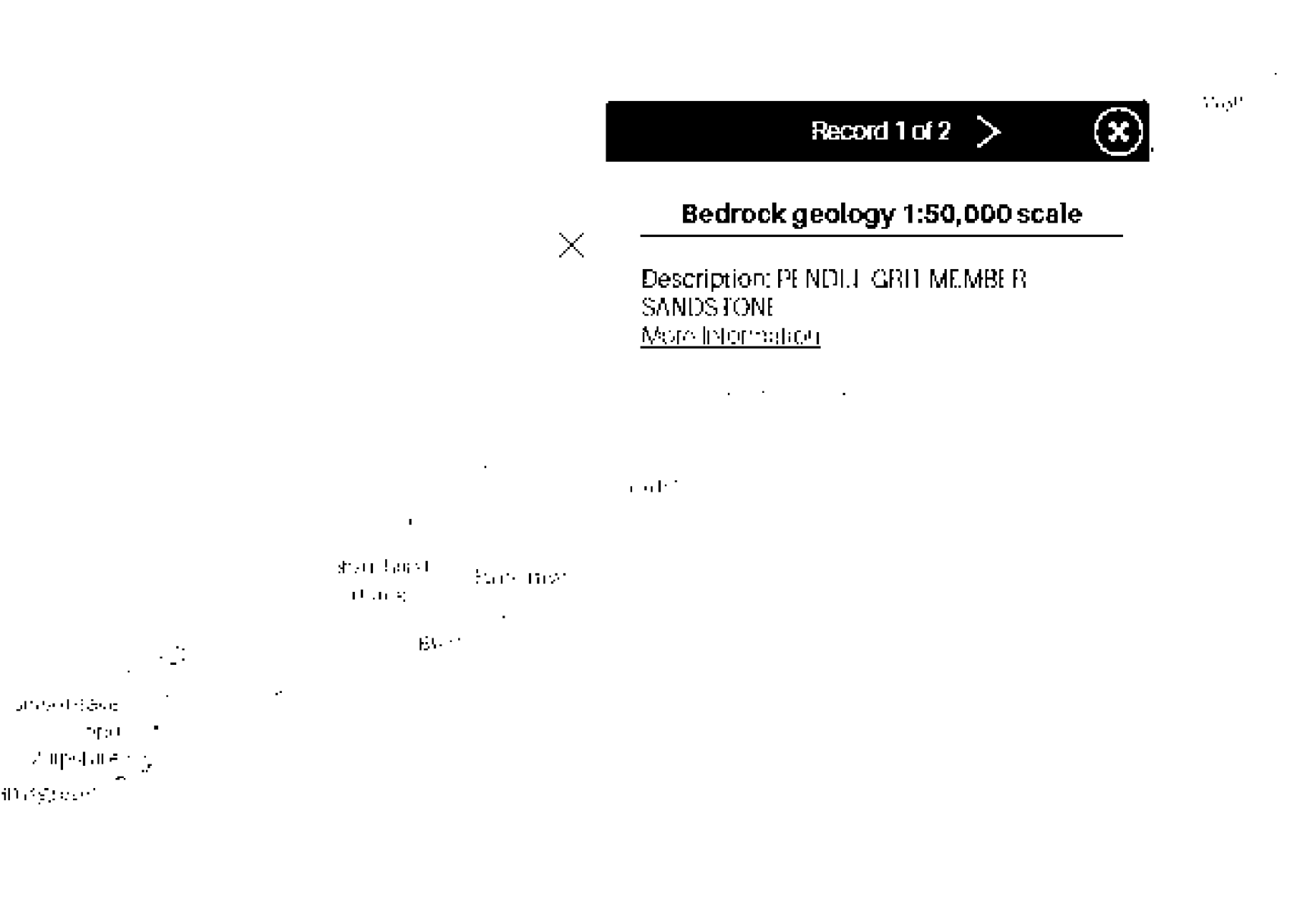
Carr Hall, Whalley Road, Wilpshire, BB1 9LJ For Donelan Trading Limited	12 04 2022
	1243
PROPOSED ELECTRIC QUAD TRACK **EXISTING SITE PLAN**	L / 32 / 03

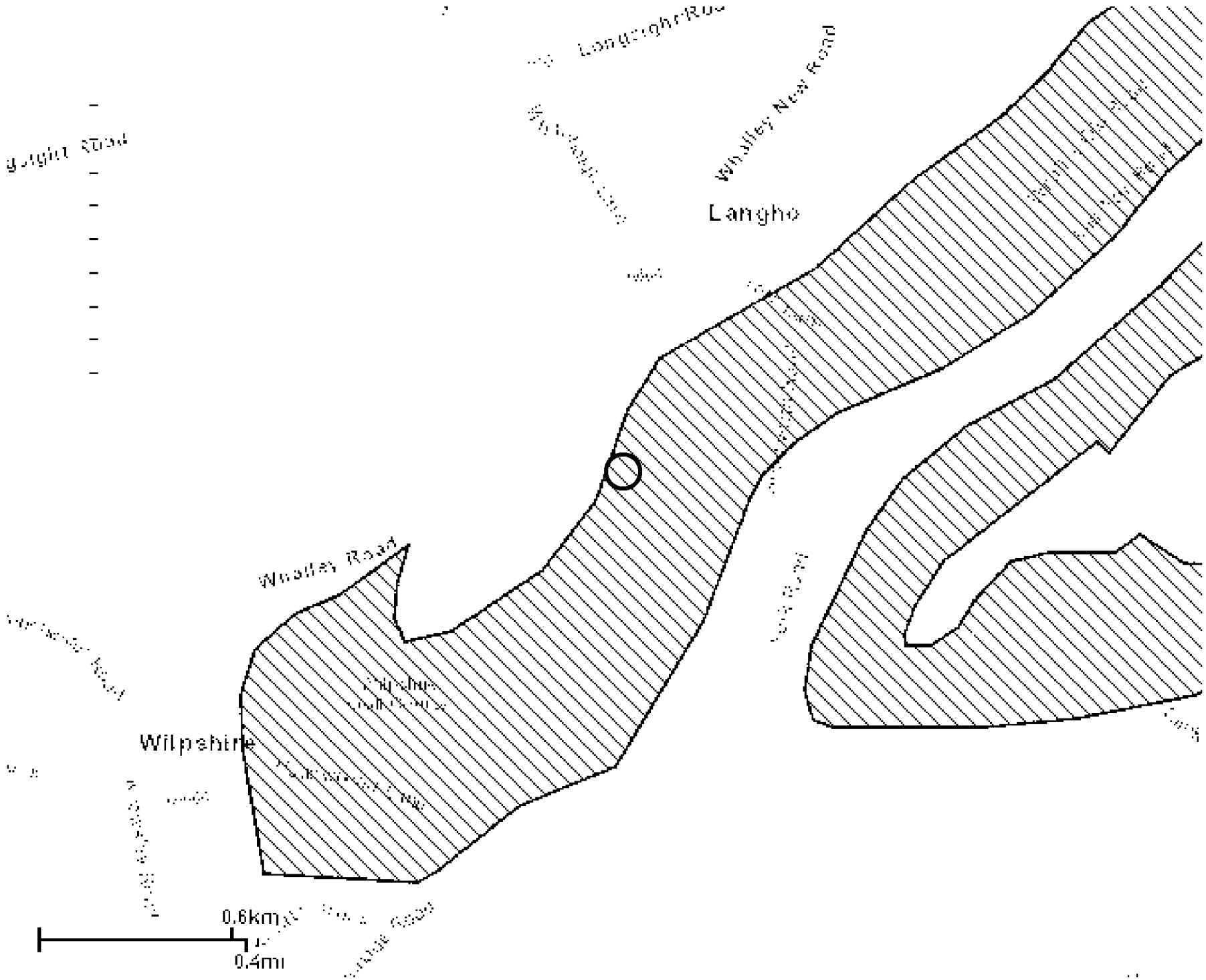
APPENDIX D - BGS Mapping & Soil Type from Soilscapes Web-Site

Record 1 of 1

Superficial deposits 1:50,000 scale

Description: TILL, DEVENSIAN - DIAMICTON
More Information


Record 1 of 2
Bedrock geology 1:50,000 scale
Description: PENDLE GRIT MEMBER
SANDSTONE
More Information



Legend

Search

Soil information

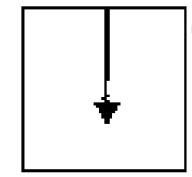
Soilscape 6:
Freely draining slightly acid loamy soils

Texture:
Loamy

Coverage:
England: 15.5% Wales: 24.4%
England & Wales: 16.7%

Selected area:
8.1km²

Drainage:
Freely draining



Fertility:
Low

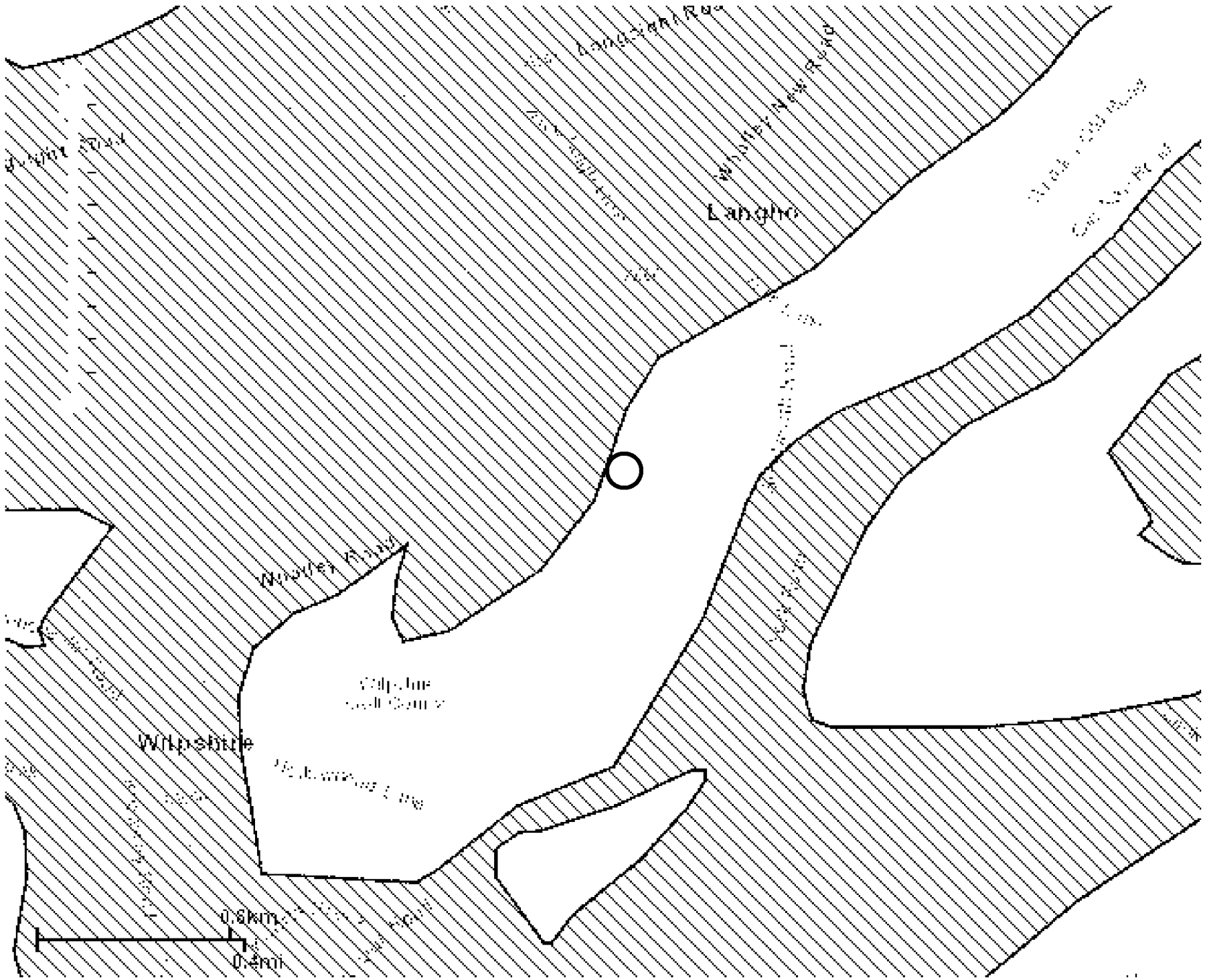
Habitats:
Neutral and acid pastures and deciduous woodlands; acid communities such as bracken and gorse in the uplands

Landcover:
Arable and grassland

Carbon:
Low

Drains to:
Local groundwater and rivers

Adjust transparency



Legend

Search

Soil information

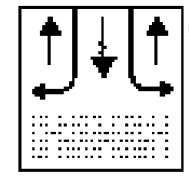
Soilscape 17:
Slowly permeable seasonally wet acid loamy and clayey soils

Texture:
Loamy and clayey

Coverage:
England: 7% Wales: 15.1%
England & Wales: 8.2%

Selected area:
711km²

Drainage:
Impeded drainage



Fertility:
Low

Habitats:
Seasonally wet pastures and woodlands

Landcover:
Grassland with some arable and forestry

Carbon:
Medium

Drains to:
Stream network

Adjust transparency

APPENDIX E – Flood Map for Planning & Environment Agency Long-Term Risk Maps

Flood map for planning

Your reference	Location (easting/northing)	Created
CFC22033	**370030/433340**	**24 Jul 2022 12:12**

Your selected location is in flood zone 1, an area with a low probability of flooding.

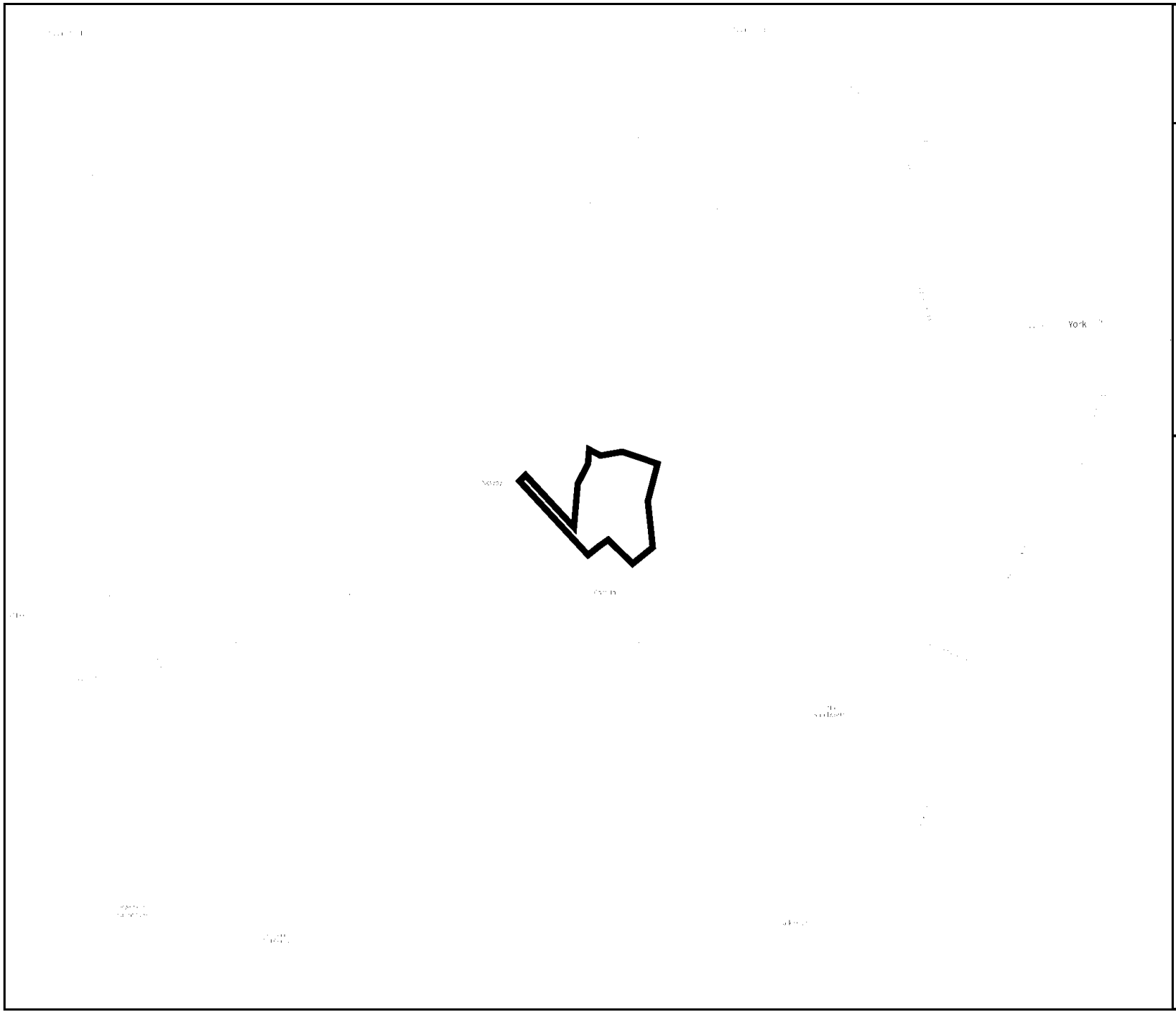
You will need to do a flood risk assessment if your site is **any of the following:**

- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.



Environment Agency

Flood map for planning

Your reference
CFC22033

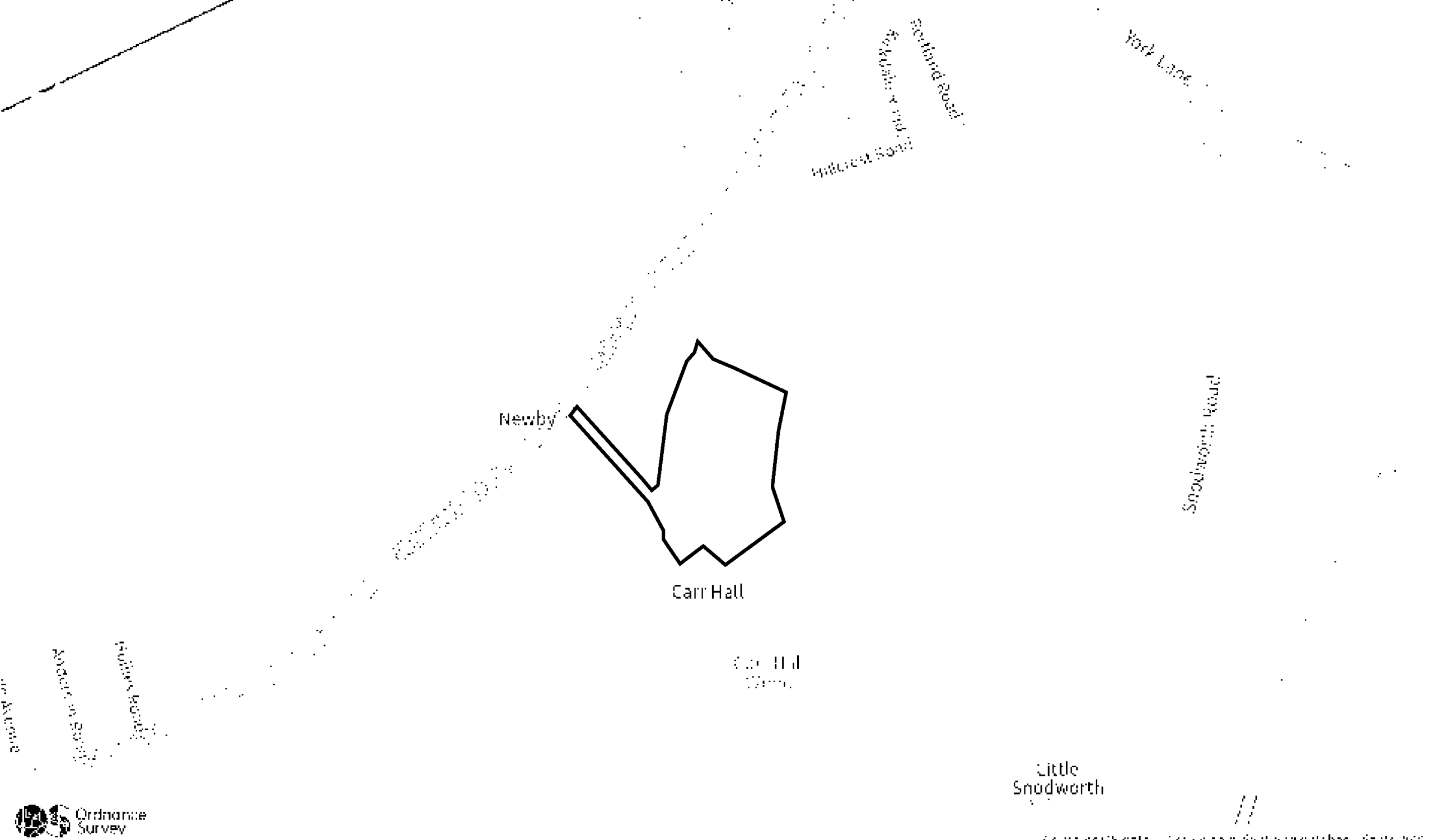
Location (easting/northing)
370030/433340

Scale
1:10000

Created
24 Jul 2022 12:12

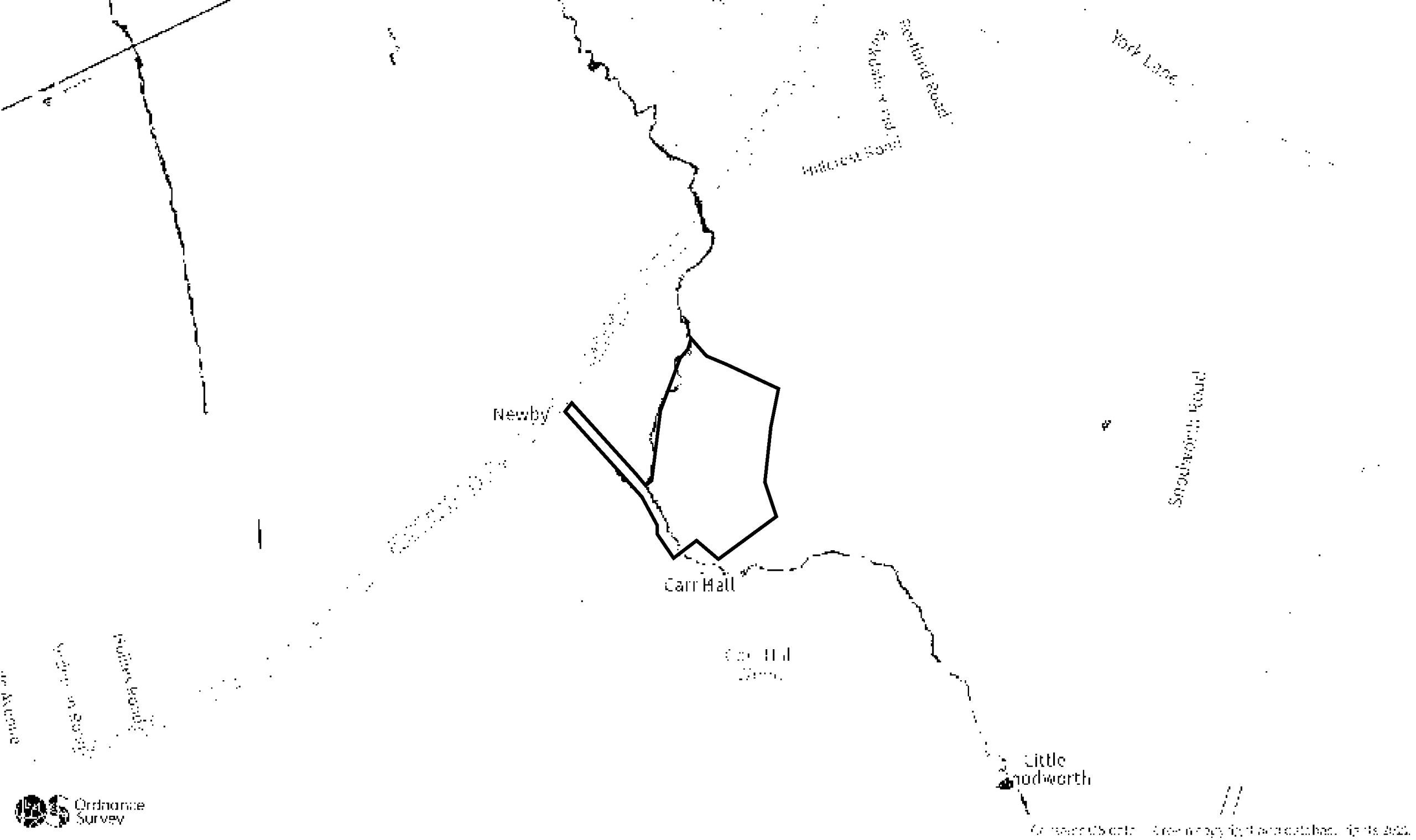
- Selected area
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 100 200 300m



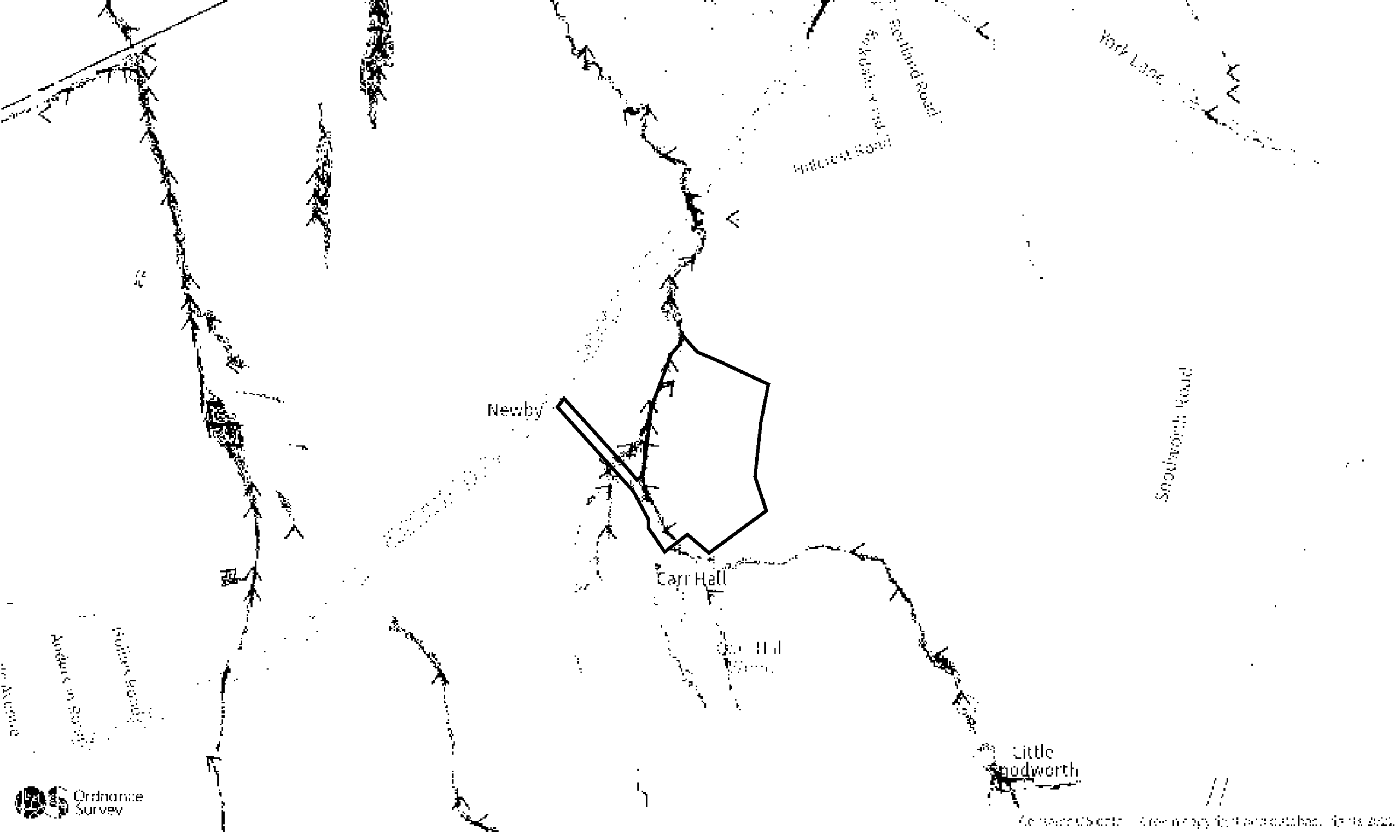
Extent of flooding from rivers or the sea

High Medium Low Very low



Extent of flooding from surface water

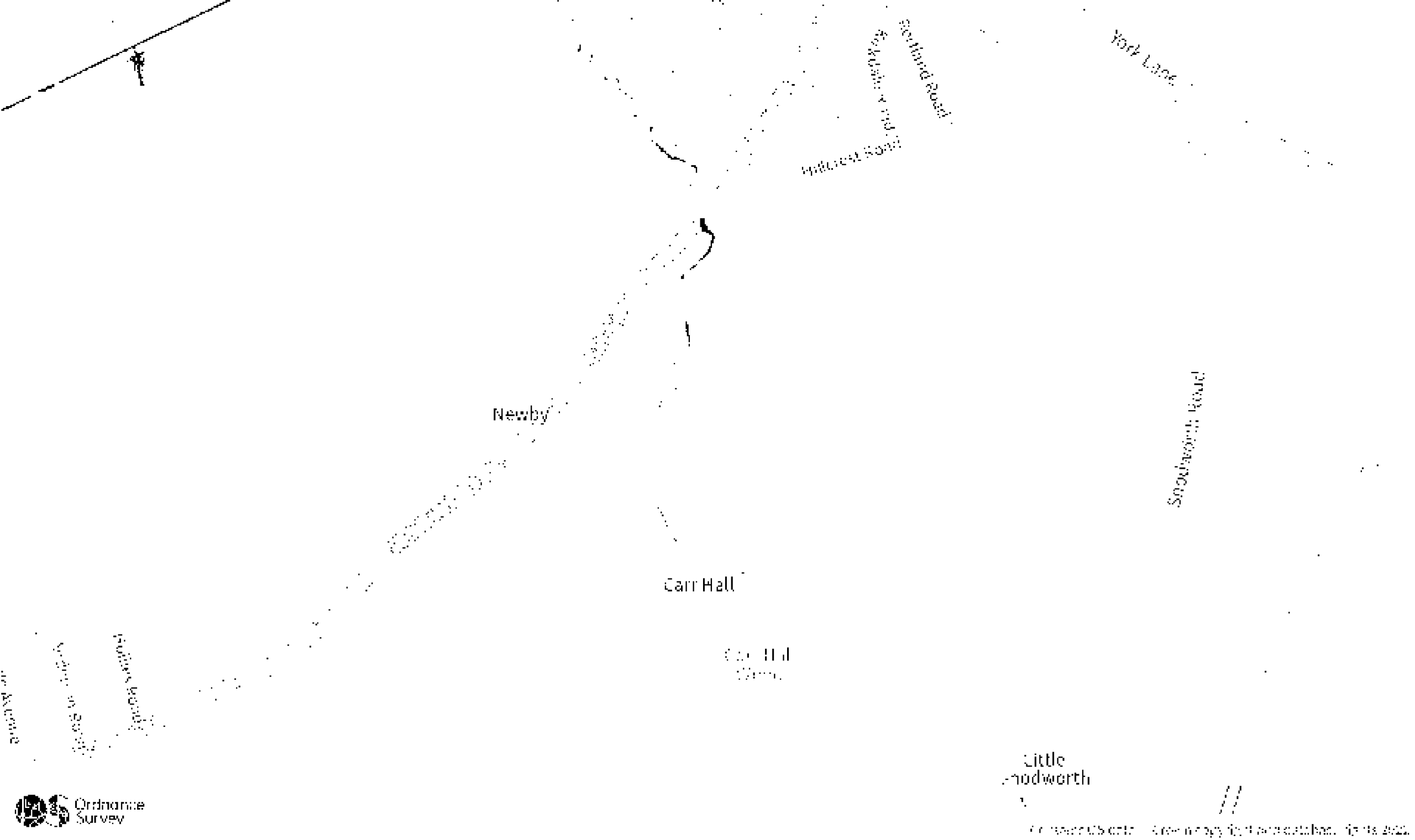
High Medium Low Very low



Surface water flood risk: water velocity in a low risk scenario

Flood velocity (metres/second)

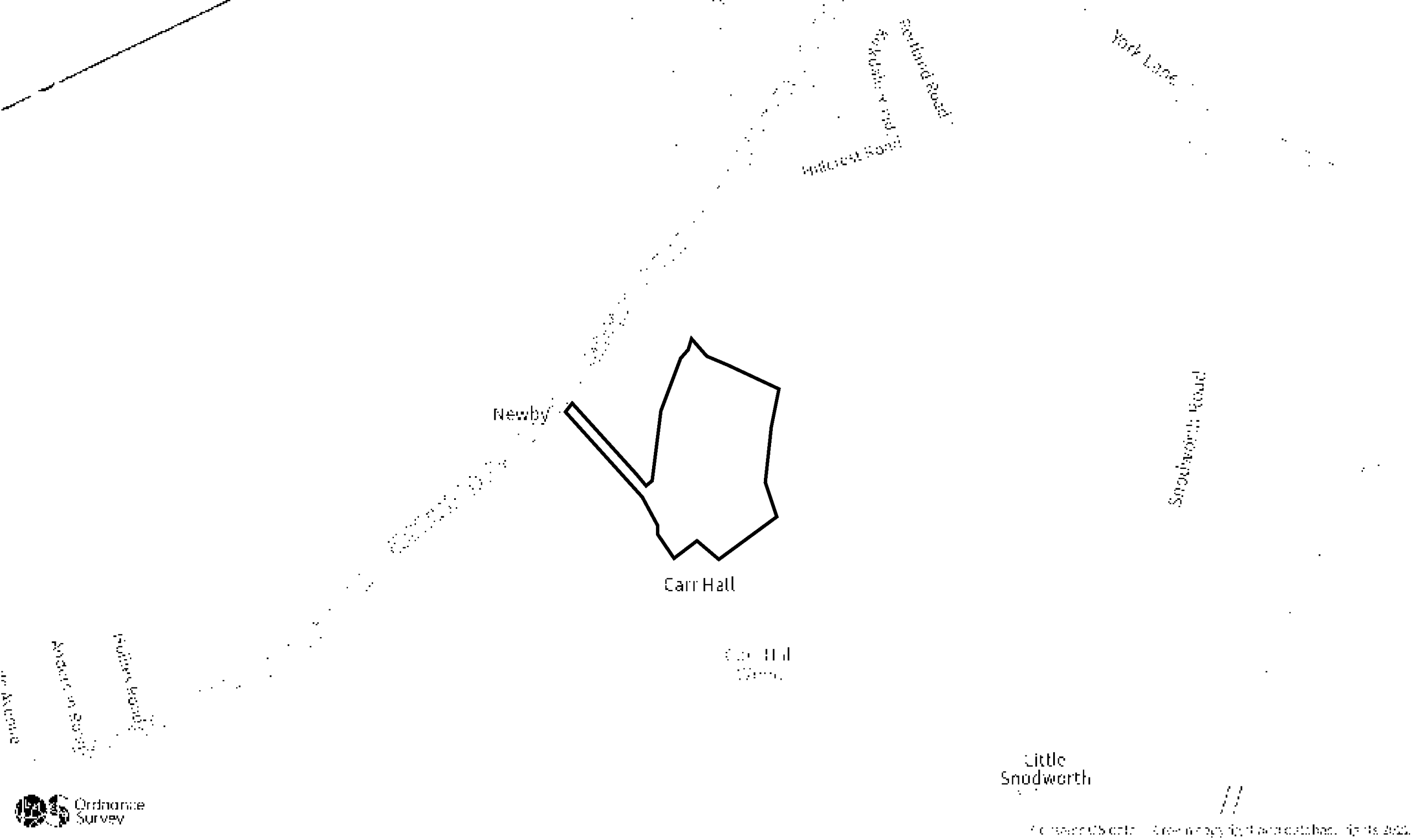
Over 0.25 m/s Less than 0.25 m/s Direction of water flow



Surface water flood risk: water depth in a low risk scenario

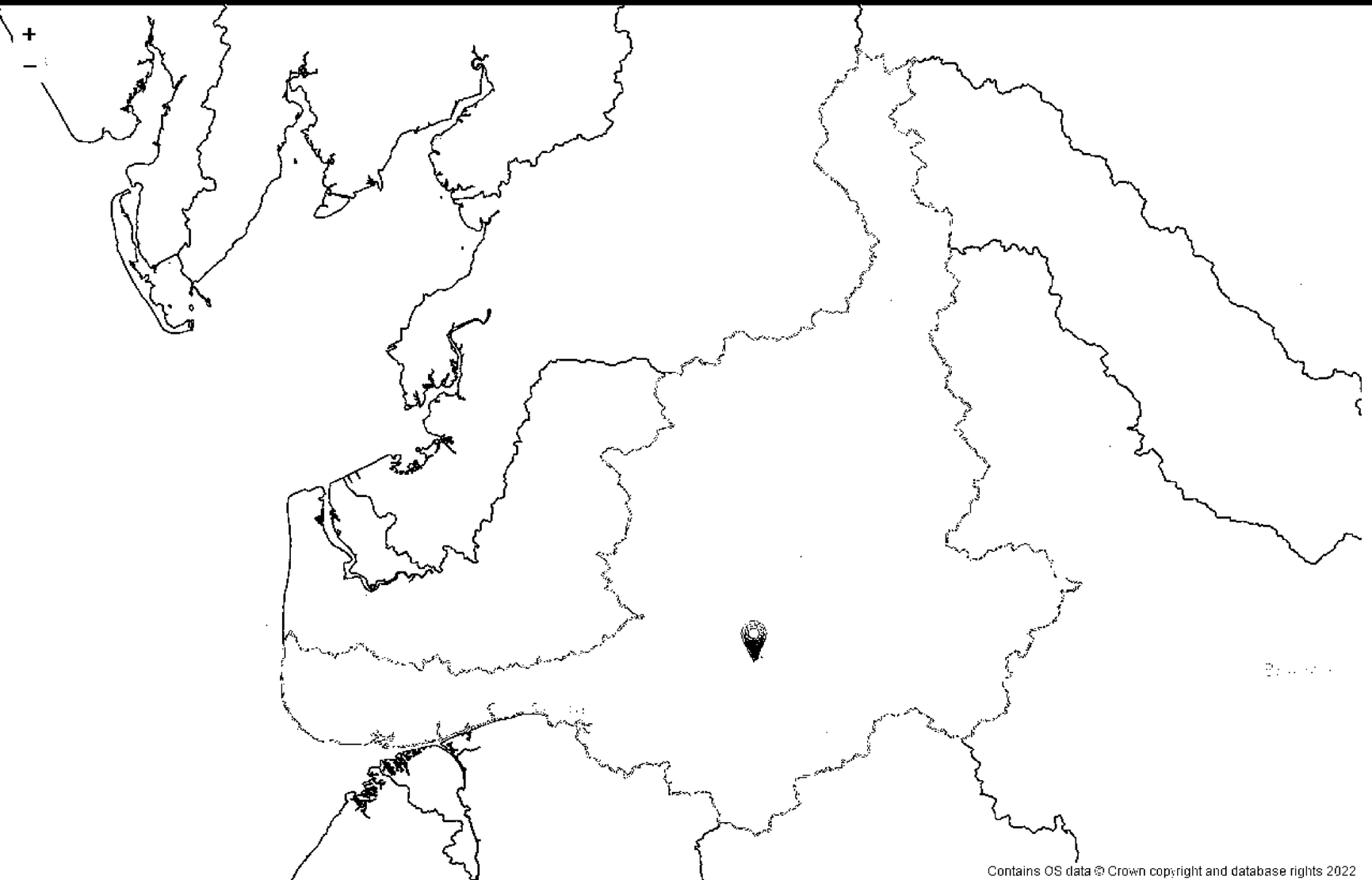
Flood depth (millimetres)

Over 900mm | 300 to 900mm | Below 300mm



Maximum extent of flooding from reservoirs:

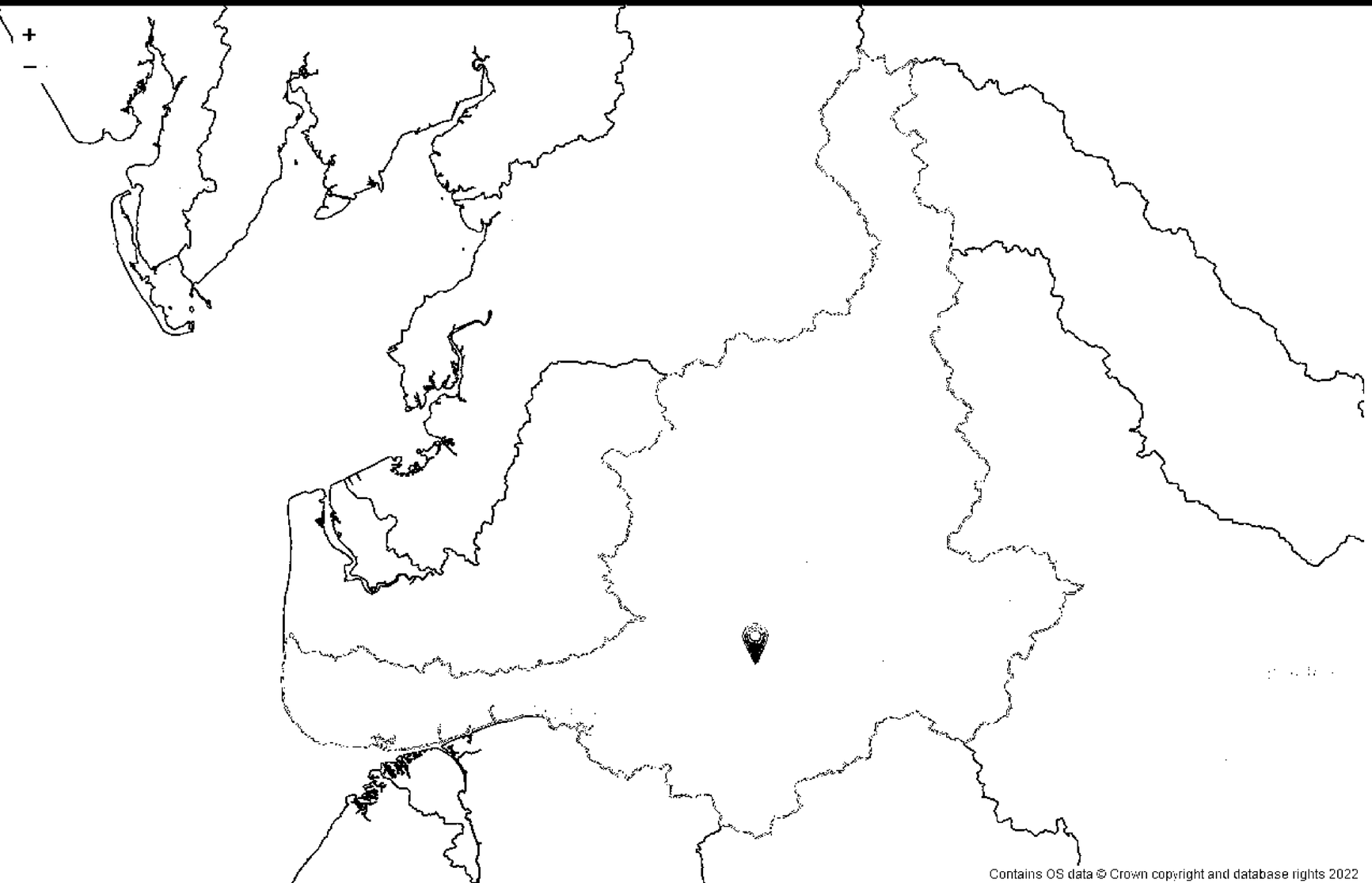
when river levels are normal when there is also flooding from rivers



Ribble Management Catchment peak river flow allowances

	Central	Higher	Upper
2020s	16%	19%	27%
2050s	23%	29%	44%
2080s	36%	46%	71%

This map contains information generated by UK Centre for Ecology and Hydrology using UK Climate projections



Ribble Management Catchment peak rainfall allowances

3.3% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	25%	35%
2070s	30%	40%

1% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	25%	40%
2070s	35%	50%

*Use '2050s' for development with a lifetime up 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.

This map contains information generated by Met Office Hadley Centre (2019) UKCP Local Projections on a 5km grid over the UK for 1980-2080. Centre for

Catchment at 370050,433500

Fit

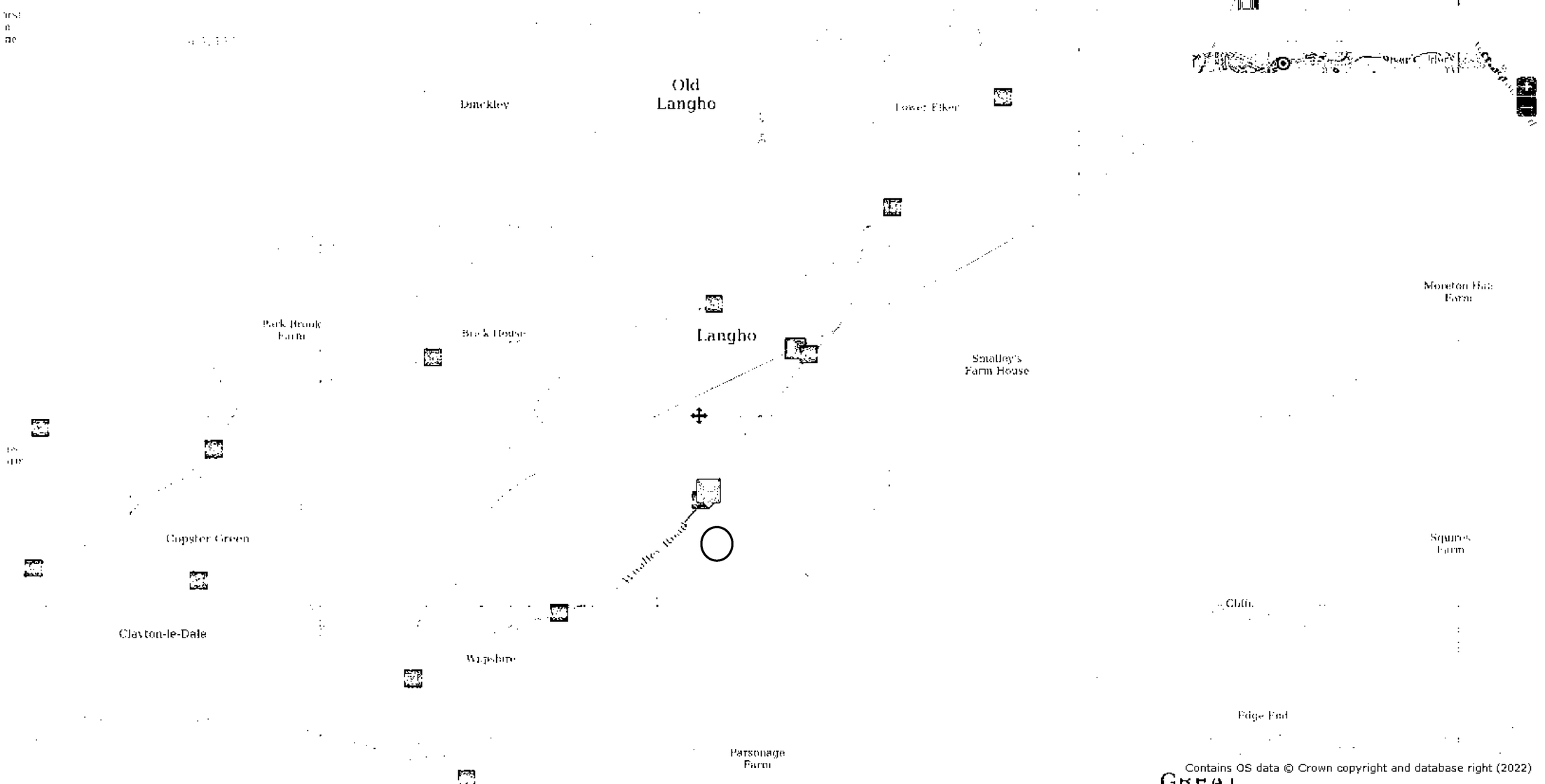
or to purchase full descriptors and rainfall data.

SD 70050 33500

0.58 km²

Map

- Gauging Stations
- Drainage Network
- Lakes
- Terrain
- 50m Grid
- [x] 1k Grid
- SAAR 41-70 (mm)
- Urban Extent 2000
- Urban Extent 1990
- British Geological Survey Hydrogeology



Catchments

APPENDIX F – Proposed Site Layout

NORTH

WHALLEY ROAD

PRIVATE ACCESS ROAD TO CARR HALL

Footpath

Issues

Pedestrian Access

PIT STOP

TRAINING TRACK

TRAINING / MAINTENANCE YARD

PROPOSED BUILDING

GREEN SPACE

CAR PARK

ACCESS TRACK

6m Radius

KEY

3m wide track system

Main track

Beginners / Tuition Track

Pit Track

Access point

KEY

23no car parking spaces.

1 no	Disabled Space
2no	Electric charging point spaces
20no	Standard 2.4 x 4.8m spaces

To be read in conjunction with the Tree Report completed by Mulberry Tree Services.

DISCLAIMER

This drawing is solely for the purpose of obtaining planning approval. We do not take any liability for design, operation and health and safety of this facility.

PROPOSED SITE PLAN

SCALE 1.500 A1

[redacted]