Shaw Lane, Carlton

Flood Risk and Drainage Assessment

B029129

Network Space

June 2022

Prepared on Behalf of Tetra Tech Limited. Registered in England number: 01959704

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CONTENTS

1.0 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

Network Space has commissioned Tetra Tech Ltd to undertake a Flood Risk and Drainage Assessment in respect of the proposed development of a 7.5ha site located north of Shaw Lane, Carlton for residential use.

This report has been prepared to accompany a planning application for the proposed development as outlined in Section 1.2. The proposed development layout plans are contained within Appendix A.

1.2 PROPOSED DEVELOPMENT

The development proposals are for a residential area of 5.6ha of approximately 200 residential units of different sizes. The works will also include associated highway, surface water and foul drainage, carparking and landscaping, public open space and SuDS area as shown in Figure 1 below .

Figure 1 – Illustrative Masterplan

A plan showing the indicative layout of the proposed development is included within Appendix A.

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1.3 REQUIREMENT FOR THIS REPORT

1.3.1 Requirement for the Flood Risk Assessment

The application site covers an area of approximately 7.5 ha and is located entirely within Flood Zone 1, i.e. land assessed as having a less than 1 in 1,000 annual probability (<0.1% AEP[1]) of fluvial flooding in any one year. In accordance with the National Planning Policy Framework (NPPF) (Chapter 14)[2] a Flood Risk Assessment (FRA) is required to support planning where a development is located within Flood Zone 2 or 3, or where the site area exceeds than 1 ha[3]. A Flood Risk Assessment is required since the site area exceeds 1 ha.

1.3.2 Requirement for the Drainage Assessment

The NPPF aims to ensure that development does not increase flood risk elsewhere and reduces flood risk where possible[4]. To this end, surface water runoff from a developed site should be managed to avoid increasing the risk of surface water flooding and, as far as it is practicable, reduce the risk to the site itself and areas elsewhere.

From 6 April 2015, Ministerial Statement HCWS 161 requires that planning policy and decisions on planning applications relating to major development are required to ensure that sustainable drainage systems (SuDS) are used for the management of surface water.

1.4 SCOPE OF THIS REPORT

1.4.1 Scope of the Flood Risk Assessment

The FRA will be undertaken in accordance with the national policy and guidance from the NPPF, Planning Practice Guidance (PPG) (Flood Risk and Coastal Change)[5] and Environment Agency[6] as well as local policy and guidance from Barnsley Metropolitan Borough Council (BMBC) as Local Planning Authority (LPA) and Lead Local Flood Authority

[1] The Annual Exceedance Probability (AEP) is the probability, expressed as a %, of a flood event occurring in any year. A large flood which may be calculated to have a 1% chance of occurring in any one year is described as 1% AEP.
[2] Ministry of Housing, Communities and Local Government (June 2019), *National Planning Policy Framework*
[3] NPPF paragraph 163 Note 50
[4] NPPF paragraph 155
[5] Ministry of Housing, Communities and Local Government (March 2014), *Flood risk and coastal change*
[6] Environment Agency (February 2017), *Flood risk assessment in flood zone 1 and critical drainage areas*

(LLFA).https://www.gov.uk/guidance/flood-risk-assessment-in-flood-zone-1-and-critical-drainage-areas

The FRA will consider all potential sources of flood risk including Main Rivers, Ordinary Watercourses (not shown on the Environment Agency's flood maps), surface water and overland flow routes, groundwater, sewers, reservoirs and canals.

1.4.2 Scope of the Drainage Assessment

The drainage assessment will be undertaken in accordance with the Non-Statutory Technical Standards for Sustainable Drainage[7] and Barnsley Metropolitan Borough Council Guidance[8]. The assessment will inform a drainage strategy for the site such that surface water runoff and foul drainage from the development site are managed appropriately.

1.5 LIMITATIONS OF THIS REPORT

This report has been prepared by Tetra Tech Ltd on behalf of Network Spaces in connection with the scope of the report as described in Section 1.4 above and takes into account the particular instructions and requirements. It is not intended for and should not be relied on by any third party and no responsibility is undertaken to any third party.

Tetra Tech Ltd accepts no duty or responsibility (including in negligence) to any party other than Network Spaces and disclaims all liability of any nature whatsoever to any such party in respect of this report.

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[7] DEFRA (March 2015), *Non-statutory technical standards for sustainable drainage systems*
[8] South Yorkshire Interim Local Guidance for Sustainable Drainage Systems (July 2015)

2.0 SITE DESCRIPTION

2.1 EXISTING SITE

The development site is located 0.5km east of Carlton and is approximately 7.5ha in area. The site is bounded on the north by arable farmland, to the east by an embankment and railway line beyond which is an industrial and commercial site. To the south the site is bounded by Shaw Lane and a Yorkshire Water pumping station / sewage works, and six residential properties. A disused section of the Barnsley Canal runs along the western boundary of the site and beyond the canal is the residential area of Carlton. The main access to the site is located on Shaw Lane in the south.

The nearest postcode to the site is S71 3HH and the site's grid reference is 437390, 410345. The site location is shown in Figure 2 below.

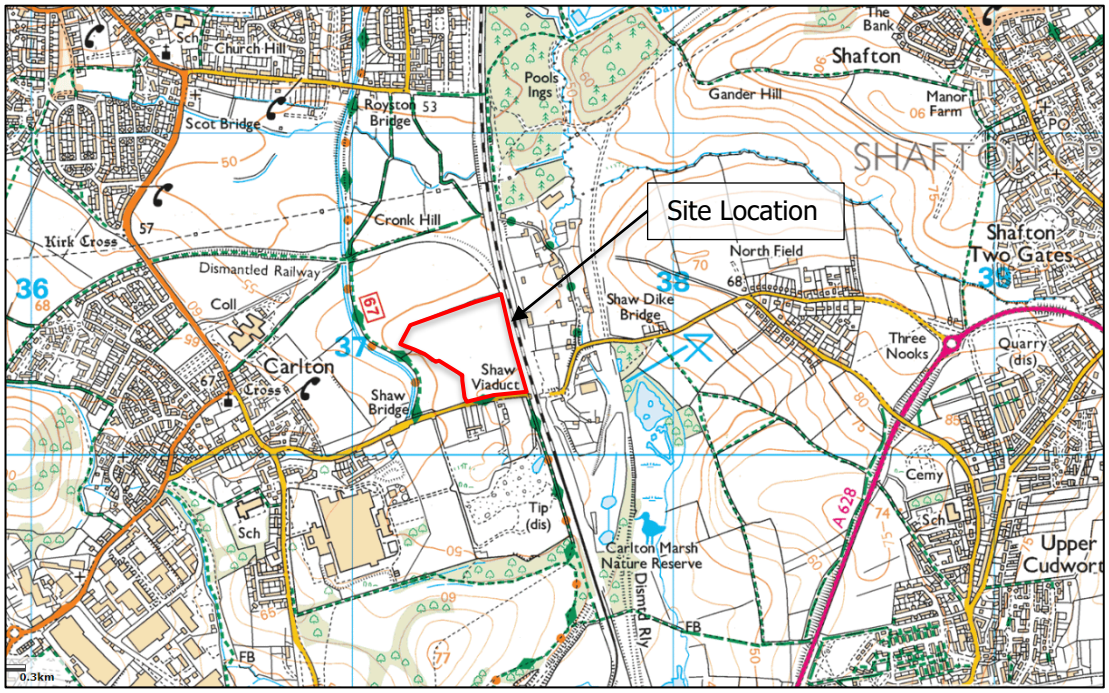

Figure 2 – Site Location Plan

A topographical survey of the site was undertaken by Survey Operations and a copy of the survey drawing dated August 2019 is included within Appendix B.

Topographic levels indicate that the site falls from north-west to south-east, with a maximum level of approximately 48m AOD on the northern boundary and the lowest site levels are

approximately 42.50m AOD on the south eastern boundary. The survey drawing indicates a ditch running along the southern site boundary, there also appears to be a shallow ditch along parts of the western boundary.

A field gate and short section of tarmac track provide access into the site from Shaw Lane in the south western corner of the land. A line of manholes are shown following a north to south alignment through the eastern half of the site and are understood to be associated with a public combined sewer. An overhead cable route is also shown through the central area of the site.

Two existing pond features are shown in the north western part of the site and appear to be interconnected with pipes of size varying from 150mm to 600mm diameter entering / leaving the ponds.

2.2 EXISTING DRAINAGE

2.2.1 Main Rivers

The River Dearne is the nearest main river (EA Classification) and lies approximately 4 km south-west of the site and menders in the south-easterly direction as shown in Figure 3 below.

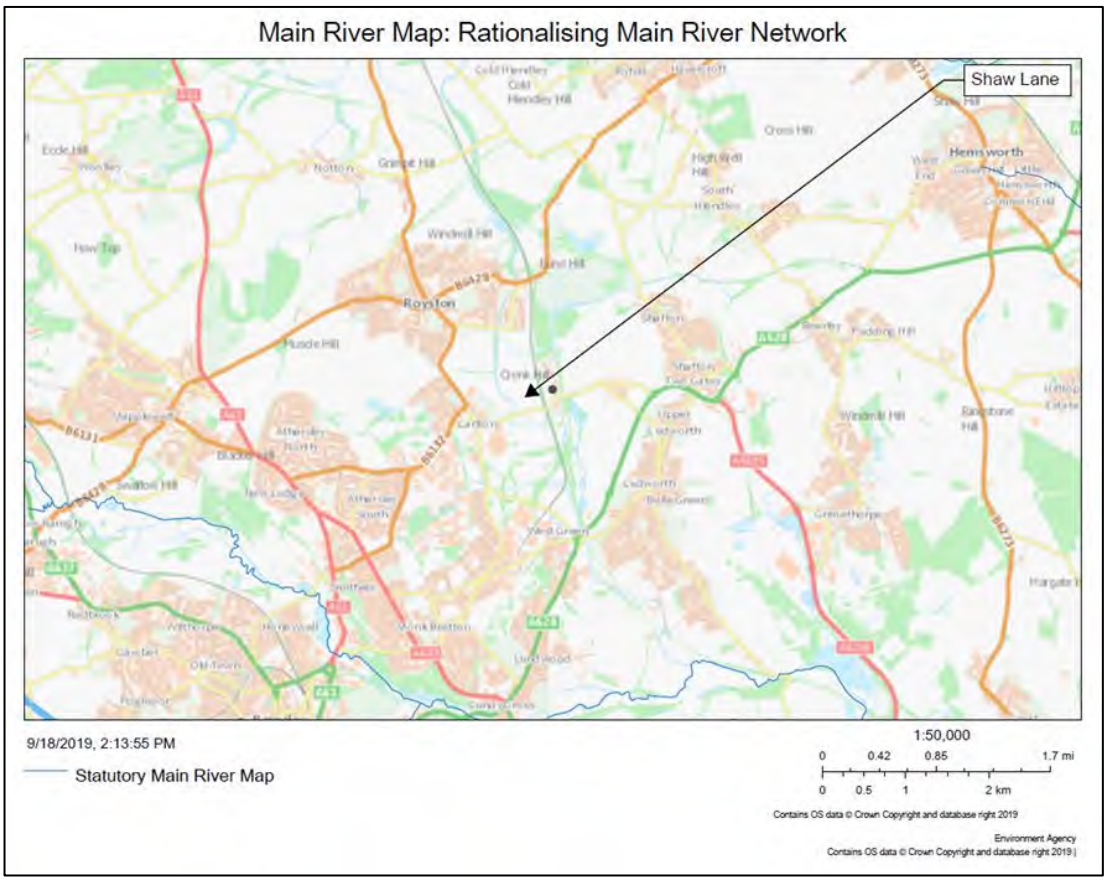

Figure 3 – Local Hydrology[9]

2.2.2 Ordinary & Manmade Watercourses

The topographic survey identifies a ditch located along the southern boundary of the site immediately north of the hedgerow that forms the southern site boundary adjacent to Shaw Lane. The topographic survey does not identify any outfall from the ditch.

Correspondence from received from Barnsley MBC Highways, has identified a watercourse adjacent to Shaw Lane on the north side of the road within the boundary of the site, which will require an easement of 6m. This prevents the erection or placement of any structure or building within 6m, measured horizontally, of any watercourse. If the developer proposed to carry out works within this easement, permission from the LLFA must be received.

The ditch/watercourse is indicated to outfall to the disused section of the Barnsley Canal via an existing outfall pipe/culvert that passes below the existing field entrance.

[9] © Crown copyright and database rights 2020 Ordnance Survey 0100031673

The site falls from north-west to south-east (Section 2.1), and therefore the site drains to the identified ditch/watercourse. This should be maintained for the new development subject to approval and agreed runoff rates.

The open section of ordinary watercourse will need to be retained but access to the site will also require a section of the watercourse and existing culvert to be modified to provide the new road access to the site. The culvert will need to be designed such that the flow capacity of the existing culvert and outfall pipe are not restricted in comparison to the existing and should meet the requirements of the LLFA.

The design of the vehicle access into the site will need to accommodate the requirements for the existing watercourse culvert and the requirements for new utility services entering the site from Shaw Lane.

Mapping for the site shows a section of the Barnsley Canal (disused) approximately 40m west of the site boundary at its nearest point.

There are numerous named Dikes in the area to the east of the railway embankment, these dikes are located as follows.

- Shaw Dike is a watercourse located 250m east of the site.
- Pools Dike/Sandybridge Dike is a watercourse located 270m north east of the site.
- Cudworth Dike is a watercourse located 360m east of the site.

The Danvm Drainage Commissioners Drainage District is located approximately 1.7km south of the development site. The Land Drainage Act 1991 and the Boards Byelaws require written consent to be sought prior to undertaking certain types of activities within the Board's Drainage District. This includes the discharge of surface water into the Board's District (directly or indirectly).

Discharge of surface water drainage is not anticipated to discharge to the Board's District.

2.2.3 Sewers

Yorkshire Water Public Sewers

A surface water sewer owned by Yorkshire Water (YW) is located within Shaw Lane to the south of the site boundary.

The YW sewer record plans show a combined sewer crossing the site on a north to the south alignment. The YW sewer is a gravity sewer falling in a southerly direction towards the

pumping station located on the south side of Shaw Lane adjacent to the site boundary. The rising main follows the alignment of Shaw Lane. An extract from the YW sewer record plan is presented in Figure 4 below and a full copy of the records is included within Appendix C.

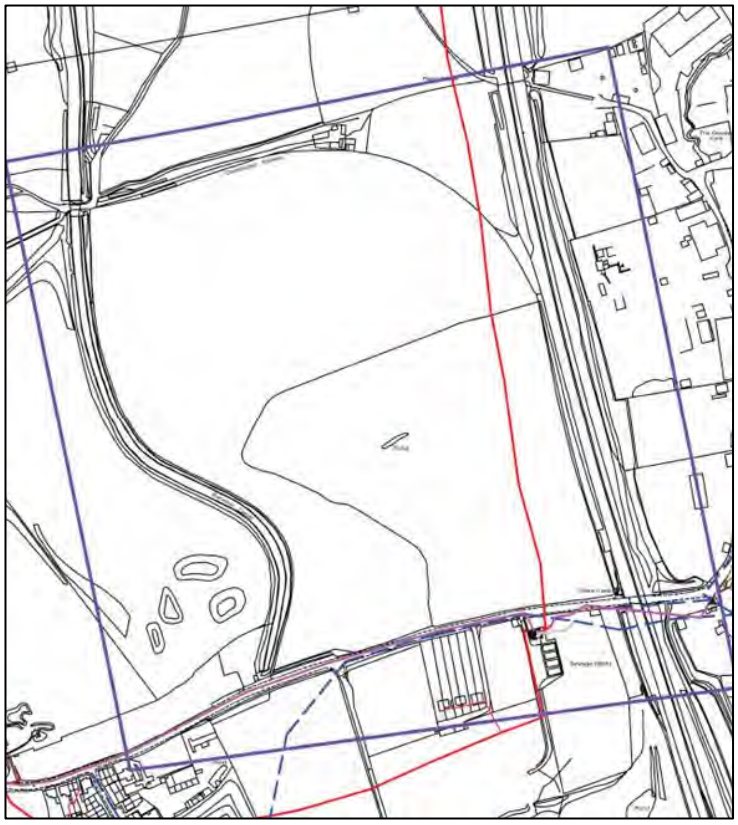

Figure 4 – Extract of Yorkshire Water Sewer Records

2.3 GROUND CONDITIONS

2.3.1 Geology

Made Ground was encountered across site on average 0.60m thick and comprised reworked topsoil of sandy gravelly clay underlain by reworked natural strata comprising of brown sandy gravelly clay.

Evidence of infilled ground was encountered as brown, grey sandy gravelly clay to a maximum depth of 1.60m bgl located to the north onsite.

Made Ground is underlain by Superficial glacial strata comprising firm to stiff, orange, brown sandy gravelly clay and locally grey, orange brown gravelly silty sand recorded up to 3.00m bgl.

Weathered bedrock was encountered in thirteen of fifteen exploratory holes between 0.40m and 2.50m bgl, observed as shallower toward the south onsite.

The site is underlain by the Pennine Middle Coal Measures Formation. A fault transects the northern part of the site orientated north east to south west with a downthrow to the south east.

2.3.2 Hydrogeology

The Coal Measures and Glaciofluvial Deposits Superficial Deposits are designated as a 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. These are generally aquifers formerly classified as minor aquifers.

The Glacial Till Superficial Deposits are classified as a Secondary Undifferentiated Aquifer. This has been assigned in cases where it has not been possible to attribute either a Secondary A or B aquifer to the soil type due to the variable characteristics. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

The site is not located within a groundwater Source Protection Zone (SPZ).

Soakaway tests have been undertaken onsite in three trial pits SA01 – SA03 as shown in Figure 5 below and on the exploratory hole location plan (Appendix G). The trial pits were undertaken in the natural strata. The soakaway results showed that an infiltration rate was not able to be generated as the water level did not fall below 75% empty within 24 hours in accordance with

DG BRE365:2016. This has been attributed to the cohesive superficial and weathered bedrock strata.

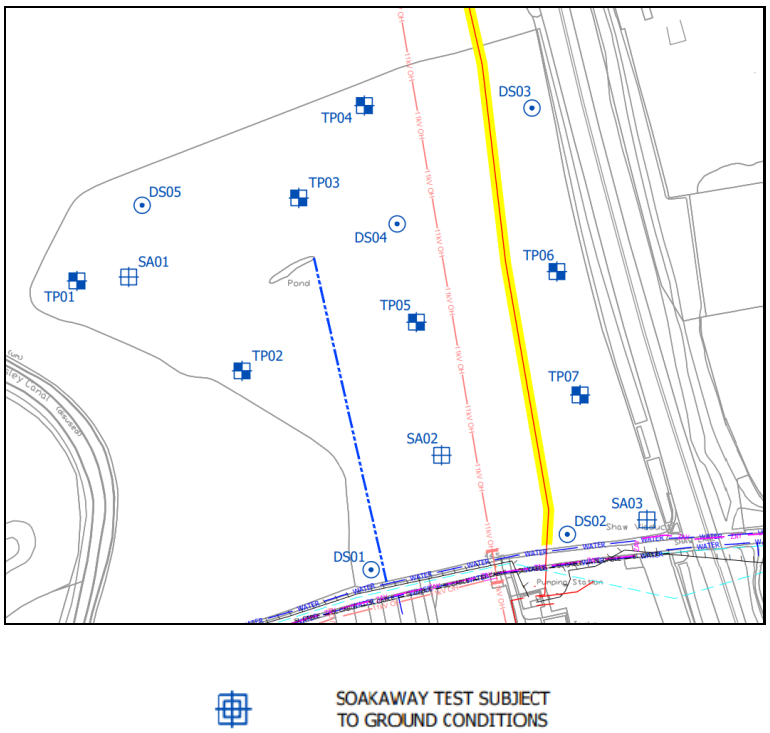

Figure 5 – Soakaway Test Locations

3.0 FLOOD RISK

3.1 HISTORIC FLOODING

Barnsley MBC is the Lead Local Flood Authority for the area. According to Barnsley MBC Preliminary Flood Risk Assessment, there are no flood history records for the site. Also, the Environment Agency was contacted in relation to historical flood records and they have provided a flood history map which confirms that the EA has no records of direct flooding to the site.

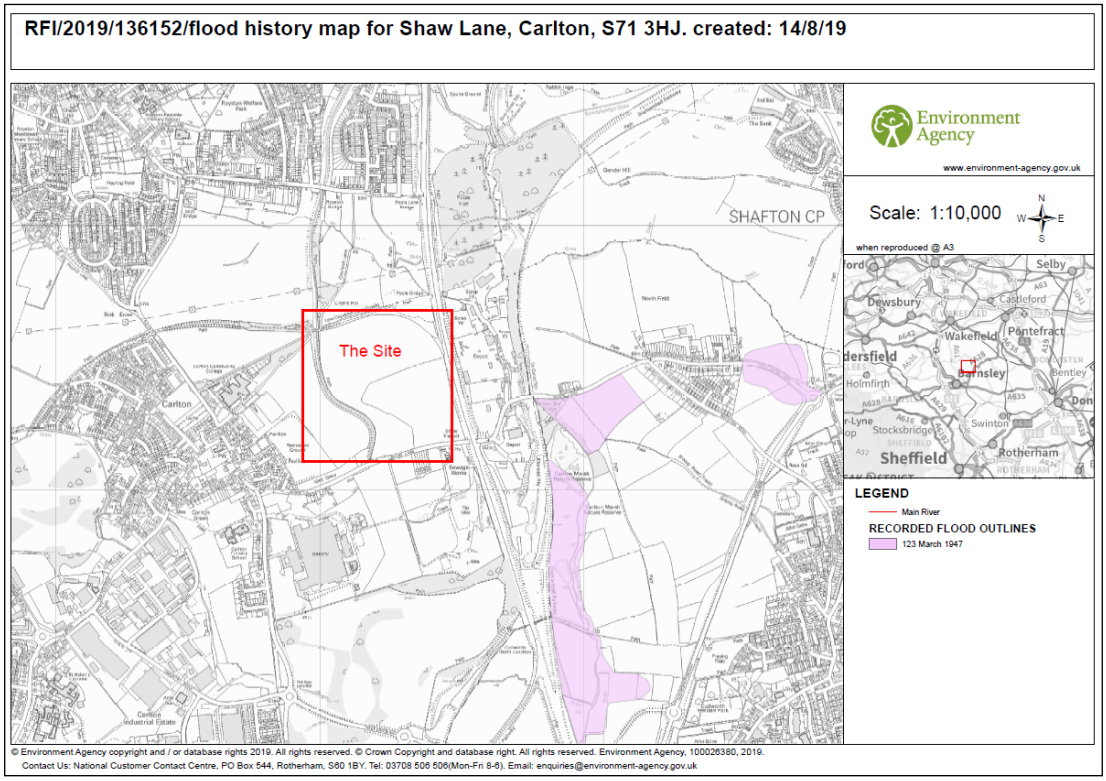

Figure 6 – Recorded Flood Outlines (EA)

3.2 FLUVIAL FLOODING

Fluvial flood risk is the risk arising from rivers and watercourses.

A number of named dikes are located to the east of the site with an approximate minimum distance of 250m. However, these water courses do not affect the site due to the site's elevated ground level.

A floodplain is the area that would naturally be affected by flooding if a river rises above its banks. In England, floodplains are divided into flood zones (FZ) for planning purposes. These areas show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. They are divided as follows:

- Flood Zone 3 shows the land having a 1 in 100 or greater annual probability of river flooding.
- Flood Zone 2 shows the additional extent of an extreme flood from rivers. It is land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding.
- Flood Zone 1 is the area of land where flooding from rivers and the sea is very unlikely having less than a 1 in 1,000 annual probability.

An extract of the Environment Agency's Flood Map for Planning is shown in Figure 7 below and also in Appendix F.

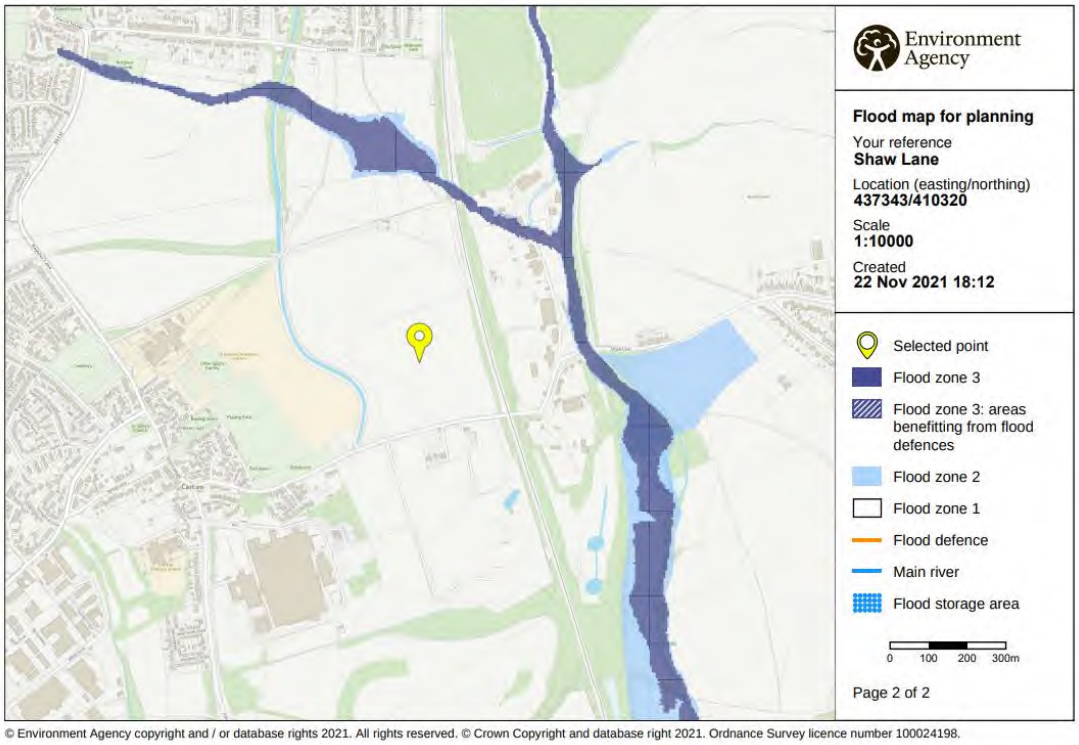

Figure 7 – EA Flood Risk Map for Planning

The application site is located in Flood Zone 1, and therefore is considered to be at very low risk of flooding from fluvial sources.

3.3 TIDAL FLOODING

The proposed development site is remote from the coast and is not therefore at tidal flood risk.

3.4 SURFACE WATER & OVERLAND FLOWS

Surface water flooding occurs where high rainfall events exceed the drainage capacity in an area (i.e. sewer system and/or watercourse), leading to flooding.

The EA distinguishes between four levels of surface water flood risk as defined below:

- Very low risk is defined as an area of land which has an annual chance of flooding (or Annual Exceedance Probability [AEP] of less than 0.1%);
- Low risk is defined as an area of land which has an AEP between 0.1% and 1%;
- Medium risk is defined as an area of land which has an AEP between 1% and 3.3%; and
- High risk is defined as an area of land which has an AEP greater than 3.3%.

An extract of the Environment Agency's Flood Risk from Surface Water Map is shown as Figure 8 below.

Figure 8 – Environment Agency Flood Risk from Surface Water Map

The Environment Agency Flood Risk from Surface Water Map indicates that areas within the north and southeast of the site are shown to be at low to medium risk.

An adjacent area outside of the development site boundary in the southwest is shown to be at low to high risk.

Since the areas of the site shown to be potentially at risk of surface water flooding form isolated areas, and are not part of a wider flood route involving runoff from adjacent land, it will be possible to mitigate against the risk of flooding as part of the development design.

The design of site ground levels will incorporate ground slopes away from buildings and towards drainage channels, gullies or other SuDS drainage features. The new drainage will be designed to intercept surface water runoff and store any excess flows. The risk to the redeveloped site from surface water flooding is not therefore considered significant.

A pond is identified on the Environment Agency Flood Risk from Surface Water Map and is also recorded on the topographic survey. Site investigation works also identified an 450mm

piped outfall from the pond falling towards the Yorkshire Water (YW) surface water sewer located within Shaw Lane.

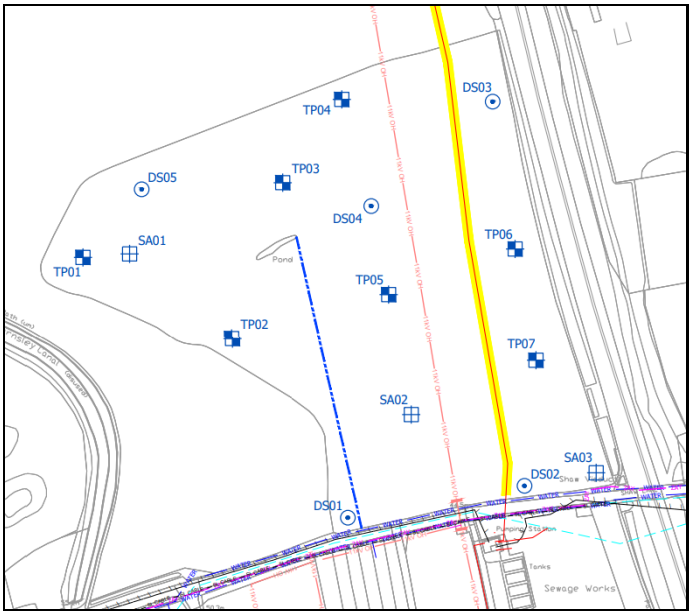

Figure 9 – Pond Outfall

3.5 GROUNDWATER FLOODING

Groundwater flooding occurs when water levels in the ground rise above the land surface. This type of flooding is most likely to occur in areas above an aquifer.

The Barnsley MBC Preliminary Flood Risk Assessment report 2011, states "There is no local information available which provides evidence on future groundwater flood risk across Barnsley and groundwater rebound is not believed to be an issue within the borough".

There is no known recorded history of groundwater flooding within the site and therefore the risk of groundwater flooding at the development is considered low.

3.6 SEWER FLOODING

Sewer flooding occurs when intense rainfall overloads the sewer system capacity and/or when sewers cannot discharge properly to watercourses due to high water levels. Sewer flooding can also be caused when problems such as blockages, collapses or equipment failure occur in

the sewerage system. This risk is predominantly associated with combined sewers and surface water sewers.

The Barnsley SFRA 2010 states "Yorkshire Water have provided data on internal and external flooding from their databases. In the Yorkshire Water managed and maintained system the incidence of external sewer flooding are not widespread or particular frequent".

The Barnsley MBC Preliminary Flood Risk Assessment indicates that the nearest sewer flooding to the site occurred approximately 1.6km north of the site.

Those areas that appear to be more prone to external sewer flooding are parts of Stairfoot, Lunwood, Elsecar, Goldthorpe, Darton, Higham, Silkstone Common, Smithies and Darfield. The location of the site or Carlton are not listed and therefore the risk of sewer flooding in these areas is assumed to be relatively low.

3.7 FLOODING FROM RESERVOIRS

Although the probability of a catastrophic dam failure is considered to be extremely low, the consequence of such an event would be severe. A review of the EA online maps of 'Risk of Flooding from Reservoirs' identified that the site is not at risk of flooding as a result of reservoir failure.

3.8 SUMMARY OF FLOOD RISK

Based on the above it can be seen that the application site is considered to be at very low risk of flooding from fluvial sources and is currently assessed as Flood Zone 1 for Tidal and River flood risk.

There are small isolated areas of the proposed development site that are identified with a risk of surface water flooding ranging between low to medium risk, which is due to the modelled topography of the site and can be addressed as part of a development levels strategy and drainage design.

The site is not at risk of flooding from reservoir failure, and is considered to be at low risk of flooding from groundwater and sewer flooding.

It is essential that no increase in flood risk occurs downstream of the site or to adjacent areas as a result of the development; this matter is discussed in more detail within Section 4.

4.0 DEVELOPMENT PROPOSALS

4.1 PROPOSED DEVELOPMENT

The proposals are for the development of 7.5 ha of agricultural land for residential purposes. The proposed scheme is to include approximately 200 new dwellings of various sizes. The scheme will also include associated highway, surface water drainage, foul sewer drainage, carparking and landscaping.

The flood risk vulnerability classification of the development is 'More Vulnerable'.

The design lifetime of 100 years has been assumed for the development.

4.2 SEQUENTIAL & EXCEPTION TESTS

One of the aims of the NPPF is to steer development away from zones of high flood risk towards Flood Zone 1. In accordance with Table 3 of the PPG (Flood Risk and Coastal Change), the proposed land and use for residential dwellings is classed as 'More Vulnerable'. As a more vulnerable land use located within Flood Zone 1, the proposed development is acceptable, and the Sequential Test is passed. The Exception Test is not required.

4.3 LOCAL PLANNING POLICIES

The site is understood to be located within the Barnsley Metropolitan Borough Council Area.

4.3.1 Barnsley MBC – Local Plan

Policy CC3 – Flood Risk

- *Not permitting new development where it would be at an unacceptable risk of flooding from any sources of flooding, or would give rise to flooding elsewhere;*
- *Requiring site-specific Flood Risk Assessments (FRAs) for proposals over 1 hectare in Flood Zone 1 and all proposals in Flood Zones 2 and 3;*
- *Expecting proposals over 1000 m2 floor space or 0.4 hectares in Flood Zone 1 to demonstrate how the proposal will make a positive contribution to reducing or managing flood risk; and*

- *Expecting all development proposals on brownfield sites to reduce surface water run-off by at least 30% and development on greenfield sites to maintain or reduce existing run-off rates requiring development proposals to use Sustainable Drainage Systems (SuDS) in accordance with policy CC4; and*
- *Using flood resilient design in areas of high flood risk.*

Policy CC4 – Surface Water Drainage

All major development will be expected to use Sustainable Drainage Systems (SuDS) to manage surface water drainage, unless it can be demonstrated that all types of SuDS are inappropriate.

The Council will also promote the use of SuDS on minor development.

To enable the Council to determine the suitability of a proposed SuDS scheme:

- *Outline Planning applications must be supported by a conceptual drainage plan and SuDS design statement; and*
- *Detailed Planning applications must be supported by a detailed drainage plan and SuDS design statement, which should contain information on how the SuDS will operate, be managed and maintained for the lifetime of the development.*

Policy CC5 – Water Quality and Resources

To conserve and enhance the Boroughs water resources proposals will be supported which:

a. *Do not result in the deterioration of water courses and which conserve and enhance:*
    i. *The natural geomorphology of water courses;*
    ii. *Water quality;*
    iii. *The ecological value of the water environment, including watercourse corridors.*
b. *Make positive progress towards achieving "good" status or potential under the Water Framework Directive in the boroughs surface and ground water bodies;*
c. *Manage water demand and improve water efficiency through appropriate water conservation techniques including rainwater harvesting and grey-water recycling; and*

d. *Dispose of surface water appropriately and improve water quality through the incorporation of SuDS, in accordance with Policy CC4.*

4.4 DEVELOPMENT & FLOOD RISK

4.4.1 Flood Risk to the Development

As discussed in Section 3.9, the site is at low risk of flooding from fluvial, tidal, groundwater, sewers and surface water flooding.

Measures intended to manage the risk of flooding within the site are outlined below.

4.4.2 Finished Floor Levels

Finished floor levels (FFL) should be raised 300mm above road levels in order to provide freeboard above events that exceed the design capacity of the drainage system. Roads will provide overland flood routes for surface water during exceedance events or a failure of the site surface water drainage system.

4.4.3 Flood Risk Arising from the Development

It is necessary to manage surface water runoff on site to avoid increasing the risk of flooding to areas elsewhere by the introduction of new impermeable surfaces, as required by the NPPF and the local policies.

4.5 SURFACE WATER MANAGEMENT

4.5.1 Drainage Hierarchy

The management of runoff should be considered via a sequential approach, in line with Building Regulations[10]. The following options for the disposal of surface water runoff have been considered, in order of preference:

- Discharge to an adequate soakaway or some other adequate infiltration system (i.e. to ground);
- Discharge to a watercourse; and
- Discharge to a sewer.

Discharge to Ground

The Geo-Environmental site investigation has confirmed that test results for the site are not appropriate for the use of infiltration SuDS. It is therefore recommended that the use of SuDS features should be restricted to those appropriate to provide interception, conveyance, detention/attenuation and water quality.

Discharge to Watercourse

The nearest main river to the site is the River Dearne which is 4km from the site. The nearest ordinary watercourse is located along the southern boundary of the site and conveys field runoff to the disused section of the Barnsley Canal (disused) approximately 40m west of the site boundary.

Connection and outfall to the existing ordinary watercourse/ditch is therefore considered appropriate for this site and maintains the existing drainage route. However, the capacity of the existing outfall and disused section of the Barnsley Canal is currently unknown and should be investigated further for the detailed application. Furthermore, in accordance with the Land Drainage Act 1991, any new connection and discharge of surface water into this existing

[10] HM Government (2010), *The Building Regulations 2010, Approved Document H (Part H3)*

drainage ditch would require land drainage consent, and therefore consultation with the LLFA to agree rates of discharge.

If the disused section of the Barnsley Canal is unsuitable to receive the full surface water runoff volume from the developed site, a second surface water outfall should be provided to the existing surface water sewer owned by Yorkshire Water (YW) located within Shaw Lane to the south of the site boundary.

Discharge to Sewer

The site investigation has confirmed that SuDS infiltration measures are not appropriate for this site. Surface water discharge at a controlled rate to the Yorkshire Water surface water drainage system should only be used if discharge to the ordinary watercourse is found to be unacceptable, or that the watercourse cannot accept the full discharge volume required for the developed site.

The use of the existing ordinary watercourse as the outfall strategy for surface water drainage should be adopted for the site surface water drainage system. The use of appropriate SuDS should also be used to reduce the rate of surface water discharge to greenfield rates and improve the quality of water leaving the site.

4.5.2 Pre and Post-Development Areas

Table 1 below summarises the existing and proposed development impermeable areas, estimated from the topographical survey and proposed site layout, respectively.

The site boundary encloses an area of approximately 7.5 ha. Comparison of the existing site and the proposed site plan (Appendix A) indicates that the permeable area of the site will be reduced by approximately 3.79 ha to accommodate the proposed residential development. This reduction is equal to 51% of the site's total area.

Status	Permeable Area (ha)	Impermeable Area (ha)
Pre-development	7.5 (100%)	0 (0%)
Post-development	4.3 (49%)	3.794 (51%)

Table 1 – Pre and Post-Development Areas

The design of the drainage system is required to consider climate change. Guidance issued by the Environment Agency (last updated February 2019) provides rainfall intensity allowances to be considered in a FRA (Table 2). Assuming that the development lifetime will extend to 2115, the applicable 'central' allowance is 20% and the upper end 40%. Therefore, an allowance for climate change of 40% has been used.

4.5.3 Pre and Post-Development Discharge Rates

The HR Wallingford UK SuDS Greenfield runoff estimation tool has been used to assess the existing rate of runoff from the site and a copy of the calculation is included within Appendix G. The calculation indicates a Qbar runoff rate of 31.89 l/s for the 7.5 ha site (4.252 l/s/ha).

The site is a greenfield site which is understood to outfall to existing ditches and ponds, and finally outfall to the Disused Barnsley Canal. The new surface water drainage system for the site will outfall via the existing drainage route. The site drainage system will also include a detention basin, and an attenuation pond to store excess flows whilst restricting discharge from the site to as close as possible to the greenfield rates using a hydro-brake. The calculated greenfield runoff rate for the site when applied to the contributing site area only is 24.5 l/s (Qbar).

Table 2 below shows the greenfield runoff rates and proposed maximum runoff rates for the development.

Storm Event	Runoff Rate from Contributing Area	
	Greenfield	Post Development
QBAR	31.89	24.5
1 in 1 Year	27.43	24.5
1 in 30 Year	55.81	24.5
1 in 100 Year	66.33	24.5
1 in 100 Year + 40% CC	-	24.5

Table 2 – Existing and Proposed Runoff Rates

4.5.4 Required Attenuation

An initial assessment for the greenfield runoff rate for the developed areas of the site has been undertaken based on the indicative site plan and it is proposed that the maximum

discharge rate will be restricted to 24.5 l/s (the QBAR rate for the proposed contributing area of the site).

Assessment for the required size of the pond has been undertaken using the HR Wallingford Surface water storage for sites on-line SuDS tool. The volume of attenuation storage required within the pond, detention basin and pipe drainage system has been calculated to be approximately 3,759 m³, based upon a controlled discharge rate of 24.5 l/s and a climate change allowance of 40% (See assessment calculations in appendix G).

The final volume required for the drainage system is likely to vary from the initial calculated volume of 3,759 m³, as the detailed design will be based upon the detailed surface water drainage system which will include storage within the piped drainage system together with any SuDS elements such as swales, detention basin and pond.

4.5.5 Proposed Surface Water Drainage Strategy

As the application is for outline planning permission the exact location of the various buildings and car parking areas are not defined, therefore an outline drainage strategy has been prepared to demonstrate that the development can be drained appropriately.

The key issue to address in developing the surface water drainage strategy for the site is the inclusion of appropriate SuDS such as, interception, detention, and water quality. Details of the SuDS options available are set out in more detail in Section 5.

The sites gravity surface water drainage system should direct surface water to SuDS features including a detention basins in a west and central area and a pond located in the south-east corner of the site. Where possible surface water runoff from footway area should be directed to adjacent areas of public open space or verge rather than draining to the highway drainage system.

Outfall to the existing ordinary watercourse/ditch is considered appropriate for this site and maintains the existing drainage route. However, the capacity of the existing outfall and disused section of the Barnsley Canal is currently unknown sand should be investigated further for the detailed application.

If the disused section of the Barnsley Canal is unsuitable to receive the full surface water runoff volume from the developed site, a second surface water outfall should be provided to

the existing surface water sewer owned by Yorkshire Water (YW) located within Shaw Lane to the south of the site boundary.

The general principles of the system are shown in Figure 10 below.

Figure 10 – Indicative Surface Water Drainage Strategy

4.6 EXCEEDANCE FLOWS

There remains a residual risk of a storm event that exceeds the capacity of the drainage system, as events beyond the 1 in 100 year plus 40% allowance for climate change storm event will not be catered for explicitly. Flooding could also occur as a result of a blockage or failure of the drainage system. In this instance the proposed dwellings will be protected by raising finished floor levels and providing exceedance routes along the new development access roads.

5.0 SUSTAINABLE DRAINAGE

5.1 REVIEW OF SUDS OPTIONS

In order to comply with the national guidelines and policies set by the NPPF and the Non-Statutory Technical Standards for Sustainable Drainage[11] the design of the surface water drainage system should seek to maximise the use of SuDS techniques. This section reviews the suitability of the different SuDS features applicable to the application site.

5.2 THE SUDS MANAGEMENT TRAIN

The main purpose of a SuDS system is to manage the surface water runoff generated by a development within the site, attenuating the additional runoff whilst providing water quality treatment to the runoff and amenity and landscape benefits to the community. The different SuDS features can be categorised as follows:

- Source Control: manage runoff at its source
  - Water butts, green/brown roofs, permeable pavements, rainwater harvesting systems, bio-retention systems.
- Site Control: manage runoff generated by a wider area
  - Swales, ponds, infiltration devices, filter strip, French drains.
- Regional Control: manage runoff generated by several sites
  - Basins, ponds and wetlands

The following is an illustration of the SuDS principles and how they may be applied to a development via a SuDS Management Train.

[11] DEFRA (March 2015), *Non-statutory technical standards for sustainable drainage systems*

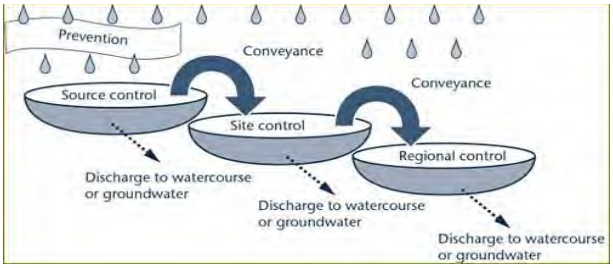

Figure 11 – SuDS Management Train

Table 3 below summarises the suitability of the different SuDS features for the proposed development site.

Table 3 – Review of SuDS features for the proposed development site

SuDS Feature		Description	Applicability to the Site
Source Control	Water butts	Small storage tanks on each individual housing plot	This is appropriate for the site.
	Rainwater harvesting	Recycling of water from roofs and impermeable areas.	This is not appropriate for the site.
	Grey water recycling	Water collected from residential and commercial use and reused	This is not appropriate for the site
	Green roofs	Vegetated roofs that reduce runoff and remove pollutants.	This is not appropriate for the site.
	Filter drains	Linear drains or trenches filled with granular material that allow infiltration to the surrounding ground	This may be appropriate for the site subject to ground conditions.
	Pervious surfaces	Surfaces that allow surface water inflow into underlying surfaces.	These may be suitable for providing an extra level of treatment, and could be used for residential parking areas.
	Rain Gardens	Shallow depressions with free draining soil and planted with vegetation that withstands occasional standing water	This may be appropriate for the site.
Site & Region	Filter drains	Linear drains or trenches filled with granular material that allow infiltration to the surrounding ground.	This is not appropriate for the site.

	Swales	Vegetated channels to convey store and treat runoff.	Site investigations have confirmed that infiltration SuDS are not considered suitable. However, swales may be appropriate adjacent to access roads to provide conveyance and improve water quality.
	Basins and ponds	Shallow areas of open space that temporarily hold water and collect silt.	This may be appropriate for the site. However, the use of infiltration is not considered viable.
	Infiltration basin	Shallow depression that stores runoff before it infiltrates into the subsoil.	This is not considered appropriate.

5.3 PROPOSED SUDS PRINCIPLES

Within the site, a variety of SuDS techniques may be suitable to provide attenuation and improve water quality. However, large scale infiltration SuDS are not considered appropriate.

The individual elements of the surface water drainage systems potentially suitable for the site are discussed in more detail below:

- Building Drainage

Roof drainage could be managed, and conventional gravity drainage systems discharging to a water butt at each property. Flows exceeding the spare volume of the water butt discharging to the adopted surface water drainage system.

- Permeable Pavements

Permeable paving, where ground conditions are found to be conducive to infiltration may discharge through its subbase into the underlying ground. In the event that infiltration is not

viable, then run off can be drained to a lined basal stone layer with the surface water run off being drained direct to the on-site adopted surface water drainage system.

- Roads & Public Realm Areas

Trapped gullies / channel drains will discharge into grass swales (where accommodated) or conventional or oversize below ground piped gravity drainage system, discharging to a SuDS pond / infiltration or detention basin. These areas may also use rain garden areas as potential outfall for limited flows, subject to suitability.

It is recommended that further consideration be given to the incorporation of SuDS measures as the design is developed to provide water quality, amenity and ecological benefits to the scheme.

5.4 WATER QUALITY

The SuDS design should seek to provide an appropriate management train of SuDS features to effectively mitigate the pollution risks associated with the proposed land uses.

In accordance with Table 26.2 of The SuDS Manual CIRIA C753, the pollution hazard level is considered to be 'Low' for the proposed land use. Therefore, the requirements for discharge to surface waters state that the 'Simple index approach' should be used. Step 1 of the simple index approach is to identify the pollution hazard indices for the proposed land uses as set out in Table 4 below, which is an extract of Table 26.2.

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day.	Low	0.5	0.4	0.4

Table 4 – Pollution Hazard Indices

Step 2 of the simple index approach is to select SuDS features with a total pollution mitigation index that equals or exceeds the pollution hazard index. Table 26.3 of The SuDS Manual states the mitigation indices for discharges to surface waters. These are shown below in Table 5 below.

SuDS Feature	TSS	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6

Table 5 – SuDS Mitigation Indices

The water quality requirements for the proposed development are low and can be met by incorporating a detention basin as shown in table 5. Further treatment benefit can be gained by adding other SuDS methods such as permeable paving to the treatment train.

5.5 SUDS MAINTENANCE

By their nature, SuDS require regular maintenance to keep them working effectively. The ongoing maintenance of SuDS ponds or detention basins can now be undertaken by the sewerage undertaker (Yorkshire Water) as part of the surface water sewer network adoption process provided that the design complies with the requirements of the Sewerage Sector Guidance. Early consultation with Yorkshire Water is recommended to ensure that proposals are developed in a way which is suitable for adoption. Permeable paving of private driveways or shared access will need to be maintained privately. Swales or filter drains only serving the adoptable highway may be offered to the Highway Authority for adoption.

The responsible company / party will perform the maintenance tasks required by the various elements of the drainage scheme. Table 6 below shows the maintenance requirements of the potential SuDS features.

SuDS Feature	Maintenance Task	Recommended Frequency
Permeable Paving	- Brushing and vacuuming	- Every 12 months
	- Weed removal	- Every 12 months
	- Cleaning of gulleys (where relevant)	- Every 12 months
	- Rehabilitation of surface and upper substructure	- As required

SuDS Feature	Maintenance Task	Recommended Frequency
	- Remediation of depressions and cracked blocks	- As required
	- Remediation of landscaping.	- As required
SuDS Pond / SuDS Infiltration or Detention Basin	- Remove litter and debris	- Monthly
	- Cut grass & vegetation management	- Spring and Summer
	- Inspect inlets, outlets and structures	- Every 12 Months
	- Remove sediments from inlet and outlet	- Every 12 Months
	- Repair erosion and other damages	- As required
	- Relevel surfaces	- As required

Table 6 – Maintenance tasks and frequency required

6.0 FOUL DRAINAGE ASSESSMENT

6.1 EXISTING FOUL SEWERS

The Yorkshire Water drainage records shows a combined sewer crossing the site from the north to the south (See Figure 4). A foul pumping station is located to the south of Shaw Lane, adjacent to the site at its south east corner. A rising main is located within Shaw Lane to the east and west of the pumping station.

It is anticipated that the new development will be connected to the combined sewer system at a suitable location subject to approval from Yorkshire Water.

6.2 PROPOSED FOUL DRAINAGE STRATEGY

The developments gravity foul sewer system will drain to the existing Yorkshire Water combined sewer network and outfall to the adopted system at a suitable location. It is assumed that the connection can be made via gravity however it is recommended that a survey of the existing sewer is undertaken to confirm its alignment and depth. The plan below shows an indicative foul drainage layout shown brown.

Figure 12 – Indicative Foul Water Drainage Strategy

7.0 CONSENTS REQUIRED

7.1 WATER INDUSTRY ACT 1991

Adoption of a new sewer by Yorkshire Water will require a Section 104 application under the Water Industry Act 1991

Any new connection to the Yorkshire Water public sewer system will require a Section 106 application under the Water Industry Act 1991.

7.2 LAND DRAINAGE ACT 1991

Any new connection and discharge of surface water into the drainage ditch would require land drainage consent from Barnsley MBC as the LLFA in accordance with Section 23 of the Land Drainage Act 1991.

7.3 DISCHARGE TO GROUND CONSENTS

New discharge of surface water run-off to ground at sites affected by land contamination, or from sites used for storage of potential pollutants are likely to require an environmental permit.

8.0 CONCLUSIONS & RECOMMENDATIONS

8.1 CONCLUSIONS

This report has identified the following conclusions:

1. The development site is shown on the EA Statutory Flood Maps for Planning as being entirely within Flood Zone 1.
2. Topographic levels indicate that the site falls from north-west to south-east, with a maximum level of 48m AOD on the north boundary and 42.53m AOD on the south boundary.
3. The proposed development site is remote from the coast and is not therefore at tidal or coastal flood risk.
4. Surface water flood mapping indicates there are small isolated areas identified with a risk of surface water flooding ranging between low to medium risk, due to the modelled topography of the site.
5. River Dearne is the nearest main river (EA Classification) and lies approximately 4 km south-west of the site.
6. According to BMBC, there are no historical records of any flooding within or around the site.
7. The site is considered to be at low risk of flooding from sewers and reservoir failure.
8. The site is considered to be at low risk of flooding from groundwater flooding.
9. The development will not increase flood risk to adjacent developments.
10. The site investigation has confirmed that infiltration SuDS are not appropriate for the site.
11. Site investigations confirmed an existing culverted outfall from the existing pond and culvert pipe outfalls to an existing ditch/ordinary watercourse located within the existing southern site boundary adjacent to Shaw Lane. The ditch outfalls to the disused section of the Barnsley Canal.

12. The final volume required for the site attenuation is likely to vary from the initial calculated volume of 3,853 m³, as the detailed design will be based upon the detailed surface water drainage system which will include storage within the piped drainage system together with the SuDS elements including swales, detention basin and pond.

13. Connection and outfall to the existing ordinary watercourse/ditch is considered appropriate for this site and maintains the existing drainage route. However, the capacity of the existing outfall and disused section of the Barnsley Canal is currently unknown sand should be investigated further for the detailed application. Furthermore, in accordance with the Land Drainage Act 1991, any new connection and discharge of surface water into this existing drainage ditch would require land drainage consent from the LLFA.

14. If the disused section of the Barnsley Canal is unsuitable to receive the full surface water runoff volume from the developed site, a second surface water outfall should be provided to the existing surface water sewer owned by Yorkshire Water (YW) located within Shaw Lane to the south of the site boundary.

8.2 RECOMMENDATIONS

1. A Pre-development Enquiry should be submitted to Yorkshire Water to identify any drainage capacity constraints and establish appropriate points of connection for the proposed development foul drainage system.

2. Assessment and detailed design of the site drainage should include measures relating to the removal of the existing pond and piped/culverted outfall.

3. A GPR survey should be undertaken to confirm the alignment of the Yorkshire Water sewer that crosses the site, and the alignment of the culverted pond outfall.

APPENDIX A – INDICATIVE MASTERPLAN DRAWINGS

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Tetra Tech Limited. Registered in England number: 01959704
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Illustrative Masterplan

Client Name:	Network Space	Scale:	1:1000 @A2 (approx.)
Project No:	P3921	Discipline:	Masterplanning
Title:	Shaw Lane, Carlton	Date:	25 January 2022
Drawn By:	DK	Drg No:	P3921-SPa-XX-ZZ-00-M2-10-005
Checked By:	EH	Revision:	*

Shaw Lane, Carlton
Planning

network space

shawlane.info

KEY

SURFACE WATER SEWER AND MANHOLE

INDICATIVE LOCATION OF EXISTING SURFACE WATER SEWER

EXISTING DITCH / ORDINARY WATERCOURSE

FOUL SEWER AND MANHOLE

INDICATIVE LOCATION OF EXISTING COMBINED SEWER EASEMENT

POND WITH RETAINED WATER LEVEL.

DETENTION BASIN - DETAINED VOLUME 1359m³ AT 0.5m DEPTH ABOVE REDUCED GROUND LEVEL.

TOTAL VOLUME OF DETENTION BASINS 2154m³.

VOLUME TO BE PROVIDED WITHIN PIPE DRAINAGE SYSTEM USING OVERSIZE PIPES 1699m³.

TOTAL ATTENUATION VOLUME 3853m³.

FOR INFORMATION ONLY

Rev	Description	Date	Drn	Chk	App
P04	DRAINAGE OUTFALL REVISED	5.5.22	DH	GM	GM
P03	SITE LAYOUT REVISED	21.1.22	DH	GM	GM
P02	STORAGE LOCATIONS REVISED	27.9.21	GM	GM	APF
P01	FLOOD RISK ASSESSMENT	23.9.21	GM	GM	APF

Document Control

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Client

network space

Project Name

SHAW LANE
CARLTON

Sheet Title

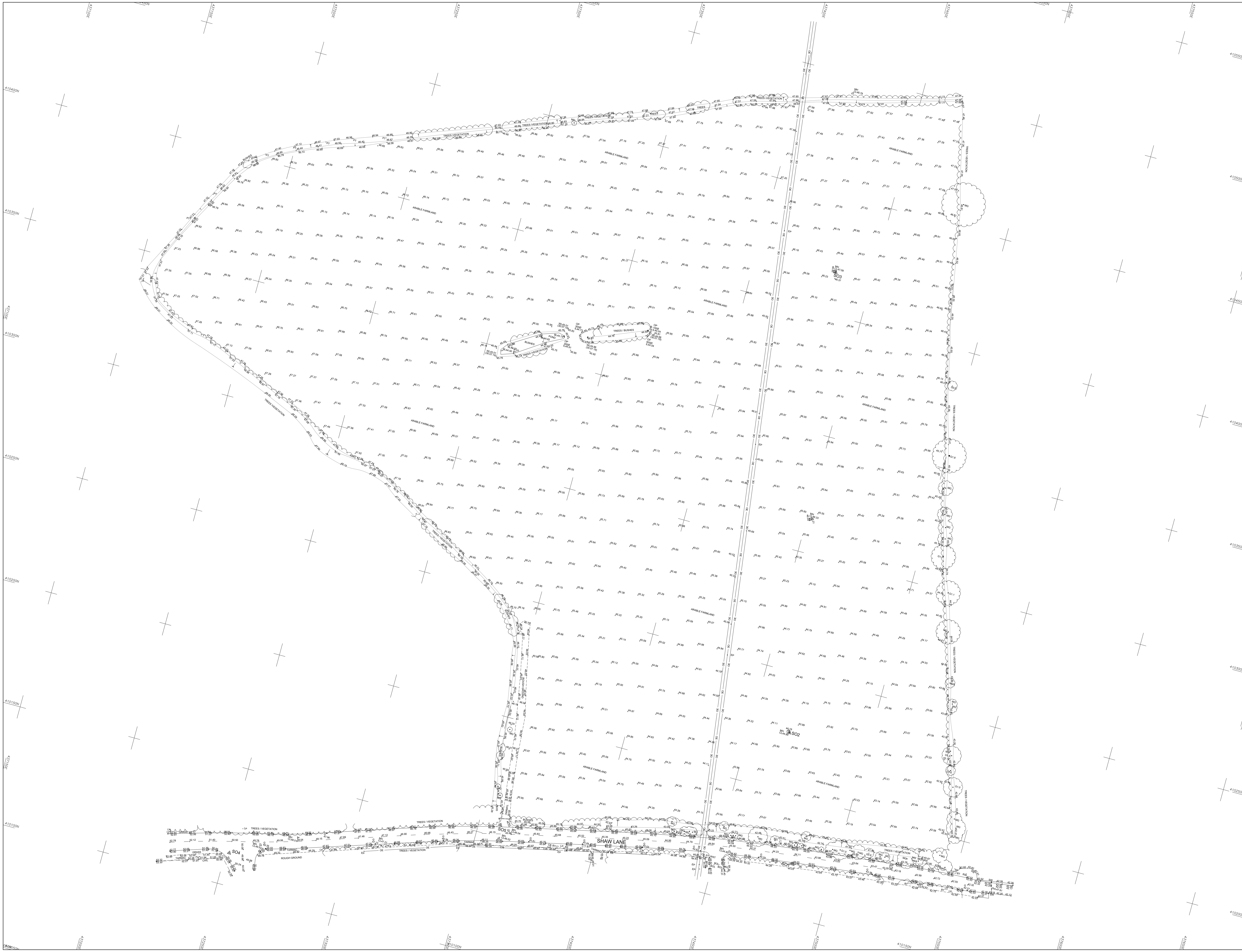
INDICATIVE SITE DRAINAGE

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A1	Suitability
B029129	GM	SEP 21	DH	SEP 21	APF	SEP 21	1:1000	S0

Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision
B029129	TET	XX	XX	SK	-	0001	P04

TTE_MT_v3

APPENDIX B – TOPOGRAPHICAL SURVEY



Note:

The survey is plotted on a plane local Grid. Orientation to National Grid. All levels relate to Ordnance Datum, achieved using the OS National GPS Network.

Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

SURVEY STATIONS			
Name	Easting	Northing	Height
SO1	437482.17	410171.76	44.16
SO2	437466.66	410224.98	44.83
SO3	437434.40	410417.87	47.01
SO4	437251.52	410113.67	50.52
SO5	437359.05	410155.19	46.20

STANDARD REFERENCE & ABBREVIATIONS

(AR)........Assumed Route
AB.........Air Brick
AV.........Air Valve
B/W........Barbed Wire
BAR........Barrier
BB.........Belisha Beacon
BH.........Borehole
BL.........Bed Level
BOL........Bollard
BS.........Bus Stop
BT Box......British Telecom Box
BT.........British Telecom IC
BRTW.......Brick Retaining Wall
BW.........Brick Wall
C/B........Close Boarded
C/I........Corrugated Iron
C/P........Chestnut Paling
CB.........Control Box
CBW........Concrete Block Wall
CCTV.......Closed Circuit TV
CD.........Cable Duct
CEL........Cellar Light
CH/L.......Chain Link
CHY........Chimney
CL.........Cover Level
CM.........Cable Marker
COL........Column
CONC.......Concrete
CP.........Catch Pit
CRTW.......Concrete Retaining Wall
CTV........Cable Television
CUL........Culvert
CW.........Concrete Block Wall
DC.........Drainage Channel
DPC........Damp Proof Course
DR.........Drain
DSW........Dry Stone Wall
ECP........Electricity Cable Pit
EIC........Electricity Inspection Cover
EJ.........Expansion Joint
EJB........Electricity Junction Box
EL SUB STN..Electricity Sub Station
EL.........Eaves Level
ELB........Electricity Box
EP.........Electricity Pole
ER.........Earth Rod
ETL........Electricity Transmission Line
FB.........Flower Bed
FH.........Fire Hydrant
FL.........Floor Level
FP.........Flagpole
G*.*.......Girth (of tree)
G..........Gulley
GAB........Gabion
GIP........Gas Inlet Pipe
GMKR.......Gas Marker
GST........Gas Stop Tap (Domestic)
GSV........Gas Stop Valve (Mains)
HSE........Housing
Ht.........Height
HV.........High Voltage
I/R........Iron Railing
IC.........Inspection Cover
IL.........Invert Level
IP.........Inlet Pipe
KO.........Kerb Outlet
LB.........Letter Box
LP.........Lamp Post
MG.........Multi-Girth
MH.........Manhole
MKR........Marker
MP.........Mooring Point
NP.........Street Name Plate
O/H........Overhead
O/P........Open Paling
OE.........Overhead Electric Wire
OP.........Outfall Pipe
OSBM.......Ordnance Survey Bench Mark
OT.........Overhead Telecom Wire
P/C........Post & Chain
P/R........Post & Rail
P/W........Post & Wire
PAV........Paving
PB.........Pillar Box
PC.........Pedestrian Crossing
PP.........Petrol Pump
PT.........Post or Pillar
RE.........Rodding Eye
RS.........Road Sign
RTW........Retaining Wall
RWP........Rain Water Pipe
SAP........Sapling
SL.........Sump Level
SoL........Soffit Level
SP.........Sign Post
SPL........Springing Level
SRTW.......Stone Retaining Wall
SV.........Stop Valve (unspecified)
SVP........Soil Vent Pipe
SW.........Stone Wall
TAC........Tactile Paving
TB.........Traffic Bollard
TBM........Temporary Bench Mark
TCB........Telephone Call Box
TFR........Taken From Records
TIE........Anchor Point (Masts/Poles)
TL.........Traffic Light
TLB........Traffic Light Control Box
TM.........Ticket Machine
TMC........Tarmac
TP.........Telecommunications Pole
TPIT.......Trial Pit
TS.........Trash Screen
U/C........Under Construction
U/G........Underground
UTL........Unable to Lift (MH,IC etc)
UTS........Unable to Survey
VDP........Vehicle Detector Pad
VP.........Vent Pipe
W/M........Wire Mesh
WL.........Water Level
WM.........Water Meter
WO.........Wash Out
WP.........Waste Pipe
WST........Water Stop Tap (domestic)
WSV........Water Stop Valve (mains)

Survey Operations

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Client
White Young Green

Drawing Title
Topographical Survey of Land at:
Network Space
Shaw Lane
Barnsley

Scale(s)	1:200	Surveyor	SB
Date	Aug 19	Drawn	OKS
Job Number	19G110	Checked	TP

Sheet Size & Drg Number & Revision
A0 19G110/001

APPENDIX C – YORKSHIRE WATER SEWER RECORDS

YORKSHIRE WATER
PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the ***general*** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.

2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.

3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will ***generally*** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will ***generally*** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.

4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.

5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45^{o} and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter *(see illustration below)*. Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.

6. All excavation works near to YW apparatus should be by hand digging only.

7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.

8. Adequate support must be provided where any works pass under YW apparatus.

9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.

10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.

11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.

12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.

13. ***Under no circumstances*** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.

14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversionary Works).

15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.

16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.

17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available*" should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.

18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011. Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).

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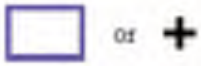
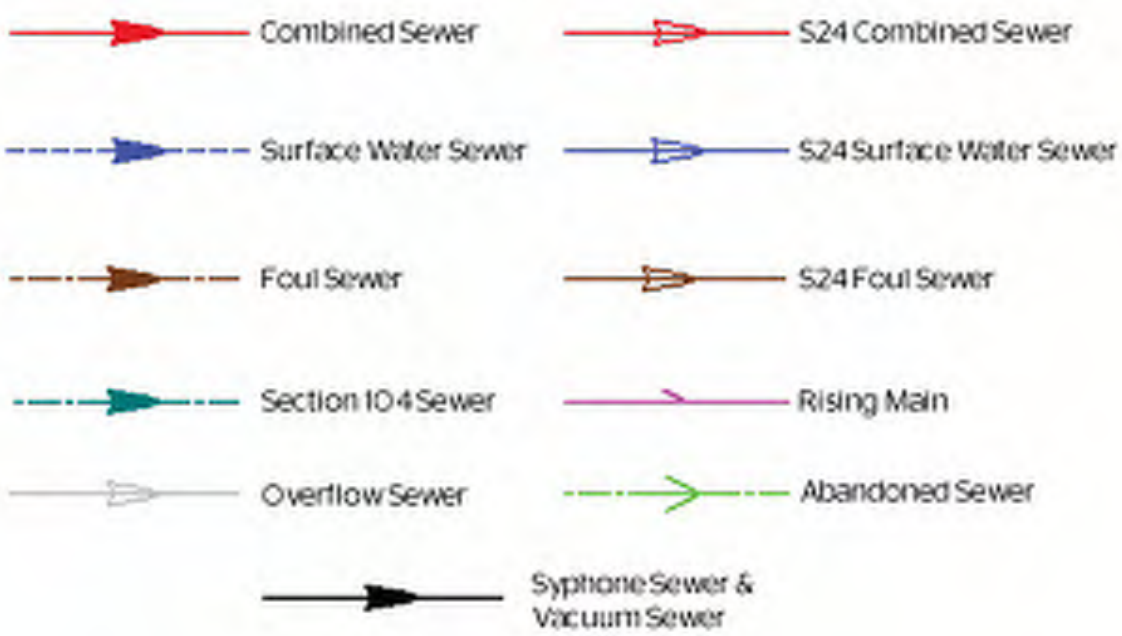
20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trail holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0345 124 24 24.

Property Identfier



Sewer Legend



Water Legend

Public Clean Water Network 12/03/2019 16:10:03 OS Grid Coordinates: 426904 : 408937 Map Name : SE3609NE svcGISSafeMo

SafeMove
A part of YorkshireWater

Public Waste Water Network 12/03/2019 16:10:06 OS Grid Coordinates: 436904 , 408907 Map Name : SE3809NE svcGISSafeMo

APPENDIX D – CORRESPONDENCE

Barnsley Metropolitan Borough Council (LLFA)
Environment Agency

Flood map for planning

Your reference	Location (easting/northing)	Created
Shaw Lane	**437343/410320**	**22 Nov 2021 18:12**

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

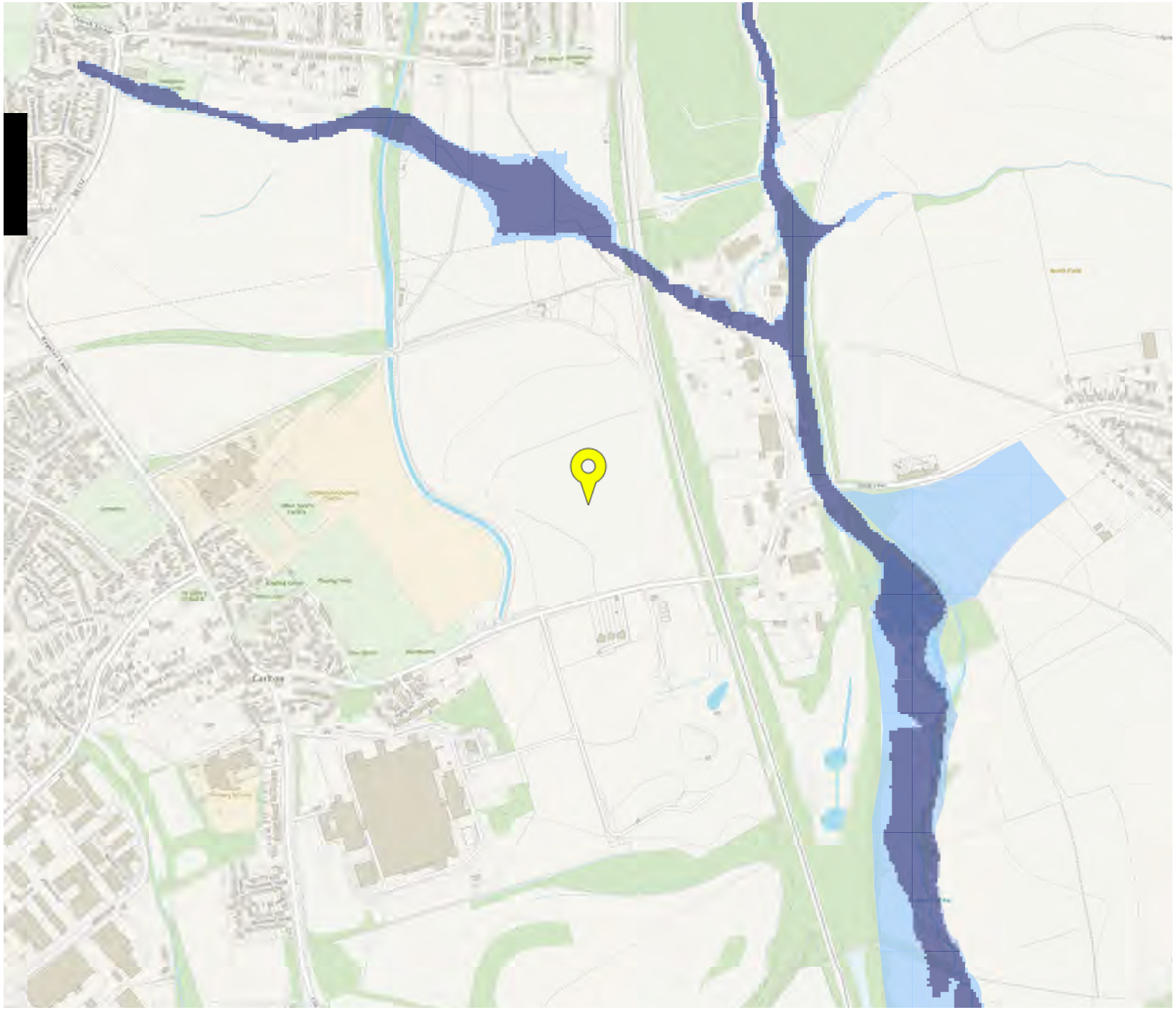
This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

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.



Shaw Lane

437343/410320

1:10000

22 Nov 2021 18:12

0 100 200 300m

RFI/2019/136152/flood map for planning for Shaw Lane, Carlton, S71 3HJ. created: 14/8/19

Environment Agency

www.environment-agency.gov.uk

Scale: 1:10,000

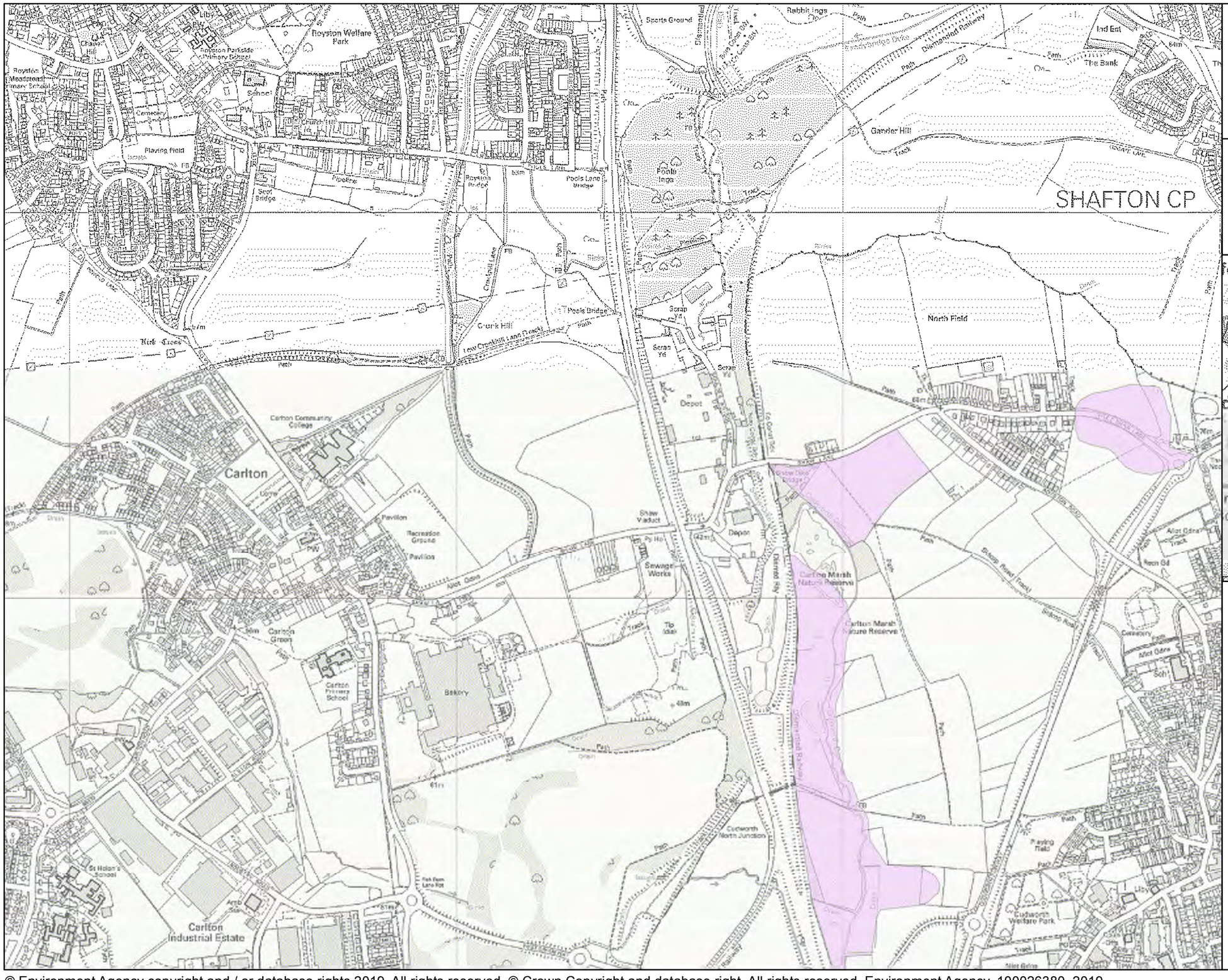
when reproduced @ A3

LEGEND

- Main River
- Flood Map Flood Defences
- Areas Benefitting From Flood Defences
- Flood Storage Areas
- Flood Zone 3 (FZ3)
- Flood Zone 2 (FZ2)

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506(Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

RFI/2019/136152/flood history map for Shaw Lane, Carlton, S71 3HJ. created: 14/8/19



Environment Agency

www.environment-agency.gov.uk

Scale: 1:10,000

N W E S

when reproduced @ A3

LEGEND

Main River

RECORDED FLOOD OUTLINES

123 March 1947

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506(Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

RFI/2019/136152/detailed river network for Shaw Lane, Carlton, S71 3HJ.

Environment Agency

Legend

- Statutory Main Rivers
- Canals
- Feeders
- Reservoirs
- Detailed River Network
  - Primary River
  - Secondary River
  - Tertiary River
  - Lake / Reservoir
  - Canal
  - Canal Tunnel
  - Extended Culvert
  - Multiple Channel Culvert
  - Underground River (potential sewer)
  - Underground River (inferred)
  - Underground River (local knowledge)
  - Undefined
- Offline Drainage features

0 100 200 300

Metres

N W E S

From: hemen.mohammadali
Sent: 23 July 2019 17:33
To: 'enquiries@environment-agency.gov.uk'
Subject: Development - Shaw Lane, Carlton, S71 3HJ

Email Enquiries – Environment Agency

I am currently preparing a Flood Risk Assessment for this site located to the north of Shaw Lane, Carlton, S71 3HJ.

Site Location;

OS X (Eastings) 437405
OS Y (Northings) 410289
Nearest Post Code S71 3HJ

The site is approximately 7.5 ha in area and is shown to be entirely within Flood Zone 1 on Flood Map for Planning.

I would be grateful if you could provide Products 3 for this site.

Could you also advise if the site is located within an area designated as a Critical Drainage Area?

Many thanks

Best regards,

Hemen Mohammad Ali
Graduate Civil Engineer

We are now a Tetra Tech company, click here to read the announcement

WYG
Quay West at MediaCityUK, Trafford Wharf Road, Trafford Park, Manchester, M17 1HH
Tel: +44 161 874 8763

www.wyg.com

From: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Sent: 24 July 2019 16:04
To: hemen.mohammadali
Subject: 190724/JBa06 - FW: Development - Shaw Lane, Carlton, S71 3HJ

Good afternoon

I have passed your e-mail to the local customer team who will deal with your request.

The Freedom of Information Act and Environmental Information Regulations state that a public authority must respond to requests for information within 20 working days.

You can find more information about our service commitment by clicking on the link below:

https://www.gov.uk/government/publications/environment-agency-customer-service-commitment

You can contact our customer team directly on the contact details below, or call the National Customer Contact Centre on 03708 506506 who will transfer you to the area team.

Please quote your enquiry reference 190724/JBa06 in any correspondence with us regarding this matter.

Customers and Engagement
Environment Agency
Yorkshire Area
Lateral
8 City Walk
LEEDS
LS11 9AT

Kind regards

Jacquie Batty
National Customer Contact Centre
Environment Agency

☎Tel: 03708 506 506

Click an icon to keep in touch with us:-

So how did we do...?

Our National Customer Contact Centre relies on customer feedback, so we really value your thoughts on how we are doing. We will always make changes where we can to improve our service. This will only take three minutes to complete:

Click here: http://www.smartsurvey.co.uk/s/NCCCcustomer/

From: hemen.mohammadali
Sent: 28 August 2019 13:52
To: 'neyorkshire@environment-agency.co.uk'
Subject: Development - Shaw Lane, Carlton, S71 3HJ

Good afternoon,

RF: 190724/JBa06

I have sent an email on 23/07/2019 regarding flood risk assessment information for a site located at Shaw Lane, Carlton, S71 3HJ. I have received an automated reply on 24/07 and saying they will respond within 20 working days. However, I have not received any email yet.

Could you please update me as soon as possible as the reports already behind the due date.

Kind regards,

Hemen Mohammad Ali
Graduate Civil Engineer

WYG
Quay West at MediaCityUK, Trafford Wharf Road, Trafford Park, Manchester, M17 1HH
Tel: +44 161 874 8763

www.wyg.com

//

The Flood Map for Planning

The Environment Agency provides the Flood Map (see enclosed extract).

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

To the best of our knowledge there is no known flood history for this site. However, in close proximity to this location we do have some flood history available (see enclosed map). 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 refer to the following table detailing the causes of those past floods.

Name	Comments	Start Date	End Date	Flood Source	Flood Cause	Source of data
123 March 1947	Extent digitised from large scale 1inch to 1mile map	19/03/1947	22/03/1947	Ordinary Watercourse	Channel Capacity	Local Authority
123 March 1947	Extent digitised from large scale 1inch to 1mile map	19/03/1947	22/03/1947	Ordinary Watercourse	Channel Capacity	Local Authority

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.

Modelling

National Generalised Modelling (NGM) 2004

The Flood Zones in this area were produced by using National Generalised Modelling that was produced in 2004. Neither water depths nor water levels were outputs that were specified when we commissioned this generalised modelling for Flood Zones. Whilst the modelling process does provide some information on depth of water, it would have been possible to produce the flood extents without storing the water depth values, since water depth is only a 'by-product' of the calculation process.

As the JFLOW modelling method was developed, tested and reviewed for production of the Flood Zone extents only, we currently have no information on the accuracy of the water depth data.

They are not suitable for use in site specific Flood Risk Assessments or Strategic Flood Risk Assessments and must not normally be used for these studies.

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.

River

Non Main River

The watercourse at this location is not designated as Main River. It is classed as an Ordinary Watercourse. The local authority holds responsibility for the maintenance of this river. The Environment Agency does not have any more information available in regard to past flooding issues or current flood risk. For any information on any past flooding and for any record of the impact of local drainage on that watercourse we suggest you speak to your City Council Drainage Section and to Yorkshire Water.

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 2010 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 is not covered by a Flood Warning.

LIDAR Data

Please note that our LiDAR data is now available free of charge (Open Data) from http://environment.data.gov.uk/ds/survey/index.jsp#/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.

Flood Portal

It's a new 'one-stop shop' web portal providing guidance and information on flood risk management in the UK. Arup have written and designed the site, in conjunction with CIRIA, the Local Government Association, the EA and Defra, primarily as a resource for local authority officers, flood risk management professionals, and others with an interest in flood risk. It's a part of the Capacity Building Strategy.http://www.local.gov.uk/floodportal

RFI/2019/136152/detailed river network for Shaw Lane, Carlton, S71 3HJ.

Environment Agency

Legend

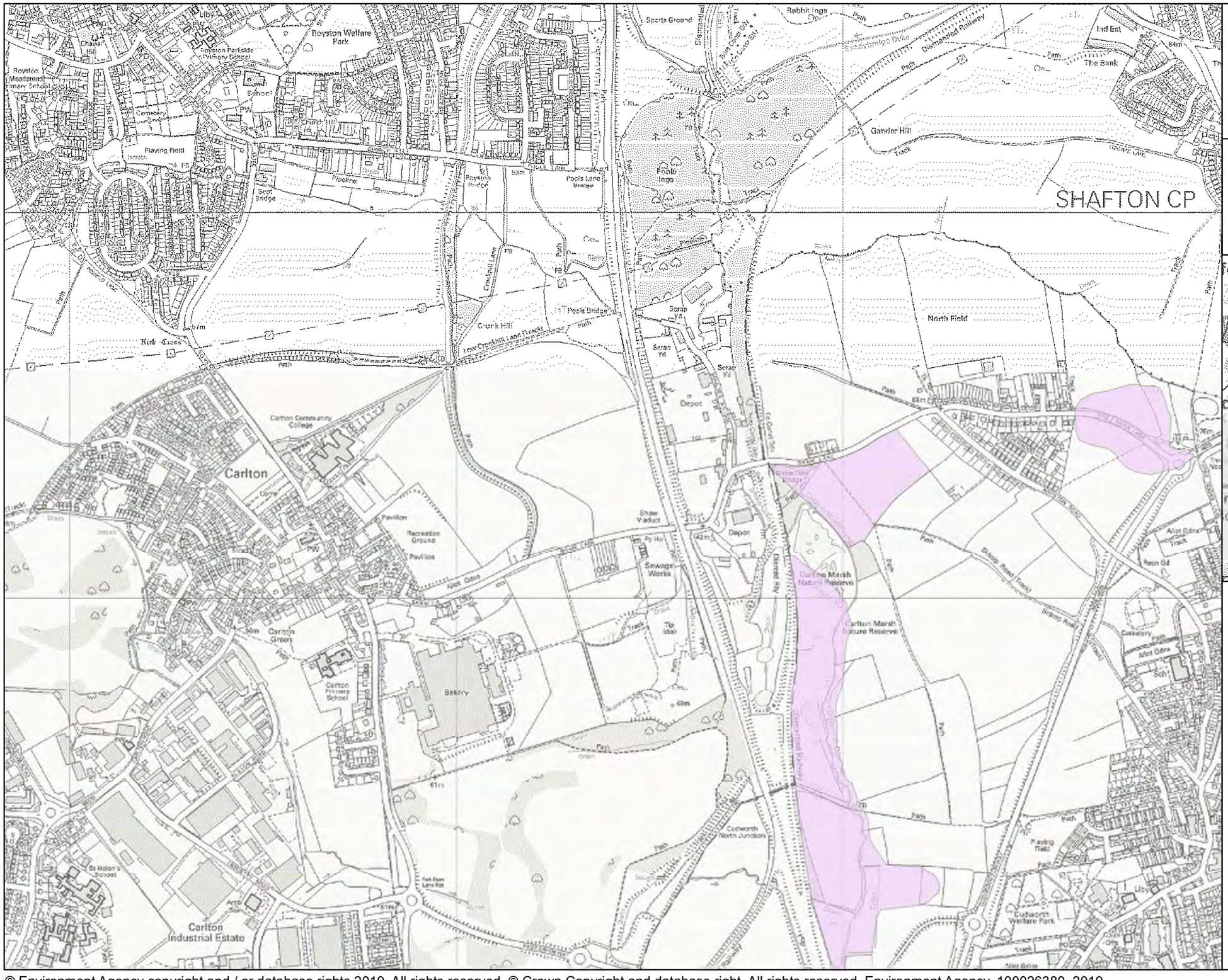
- Statutory Main Rivers
- Canals
- Feeders
- Reservoirs
- Detailed River Network
  - Primary River
  - Secondary River
  - Tertiary River
  - Lake / Reservoir
  - Canal
  - Canal Tunnel
  - Extended Culvert
  - Multiple Channel Culvert
  - Underground River (potential sewer)
  - Underground River (inferred)
  - Underground River (local knowledge)
  - Undefined
- Offline Drainage features

0 100 200 300

Metres

N W E S

RFI/2019/136152/flood history map for Shaw Lane, Carlton, S71 3HJ. created: 14/8/19



Environment Agency

www.environment-agency.gov.uk

Scale: 1:10,000

N W E S

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LEGEND

Main River

RECORDED FLOOD OUTLINES

123 March 1947

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506(Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

RFI/2019/136152/flood map for planning for Shaw Lane, Carlton, S71 3HJ. created: 14/8/19

Environment Agency

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LEGEND

- Main River
- Flood Map Flood Defences
- Areas Benefitting From Flood Defences
- Flood Storage Areas
- Flood Zone 3 (FZ3)
- Flood Zone 2 (FZ2)

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506(Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

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

From: Hastings, Robert <Robert.Hastings@environment-agency.gov.uk>
Sent: 20 August 2019 16:47
To: hemen.mohammadali
Subject: Your Enquiry: RFI/2019/136152
Attachments: Planning advice for developers.pdf;
136152_detailed_river_network.pdf;
136152_flood_history_map_for_plannning.pdf;
136152_flood_map_for_plannning.pdf;
136152_supporting_document.pdf

Our Ref: RFI/2019/136152

Dear Hemen,

RE: Provision of flood data for Shaw Lane, Carlton, S71 3HJ.

Request for information under the Freedom of Information Act 2000 (FOIA) / Environmental Information Regulations 2004 (EIR)

Thank you for your enquiry which was received on 23rd July 2019.

We respond to requests for recorded information that we hold under the Freedom of Information Act 2000 and the associated Environmental Information Regulations 2004.

The requested data is attached. Please also find attached a 'Supporting Information' document which should be read in conjunction with this data.

This information is provided subject to the Open Government Licence (here). Please read for details of permitted use.

If you are using our data to inform a development proposal, we encourage you to contact our Sustainable Places team for pre-application advice. Their advice can help you solve key environmental issues early, reduce the chance of an objection and help you design a more sustainable development. To take advantage of this service and gain further details, together with estimated costs, please email sp-yorkshire@environment-agency.gov.uk.

For general enquiries relating to your development or our role within the planning system, please refer to the attached 'Planning advice for developers' document.

I hope that we have correctly interpreted your request. If you are not satisfied with our response to your request for information you can contact us within 2 calendar months to ask for our decision to be reviewed.

Yours sincerely

Rob Hastings
Customers and Engagement Team
Environment Agency | Lateral, 8 City Walk, Leeds, LS11 9AT
robert.hastings@environment-agency.gov.uk
External: 0207 7141125 | Internal :41125

Enquiries Team Tel: 020 847 48174

Email: neyorkshire@environment-agency.gov.uk

Working days: Monday to Friday

The Flood Map for Planning

The Environment Agency provides the Flood Map (see enclosed extract).

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

To the best of our knowledge there is no known flood history for this site. However, in close proximity to this location we do have some flood history available (see enclosed map). 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 refer to the following table detailing the causes of those past floods.

Name	Comments	Start Date	End Date	Flood Source	Flood Cause	Source of data
123 March 1947	Extent digitised from large scale 1inch to 1mile map	19/03/1947	22/03/1947	Ordinary Watercourse	Channel Capacity	Local Authority
123 March 1947	Extent digitised from large scale 1inch to 1mile map	19/03/1947	22/03/1947	Ordinary Watercourse	Channel Capacity	Local Authority

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.

Modelling

National Generalised Modelling (NGM) 2004

The Flood Zones in this area were produced by using National Generalised Modelling that was produced in 2004. Neither water depths nor water levels were outputs that were specified when we commissioned this generalised modelling for Flood Zones. Whilst the modelling process does provide some information on depth of water, it would have been possible to produce the flood extents without storing the water depth values, since water depth is only a 'by-product' of the calculation process.

As the JFLOW modelling method was developed, tested and reviewed for production of the Flood Zone extents only, we currently have no information on the accuracy of the water depth data.

They are not suitable for use in site specific Flood Risk Assessments or Strategic Flood Risk Assessments and must not normally be used for these studies.

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.

River

Non Main River

The watercourse at this location is not designated as Main River. It is classed as an Ordinary Watercourse. The local authority holds responsibility for the maintenance of this river. The Environment Agency does not have any more information available in regard to past flooding issues or current flood risk. For any information on any past flooding and for any record of the impact of local drainage on that watercourse we suggest you speak to your City Council Drainage Section and to Yorkshire Water.

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 2010 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 is not covered by a Flood Warning.

LIDAR Data

Please note that our LiDAR data is now available free of charge (Open Data) from http://environment.data.gov.uk/ds/survey/index.jsp#/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.

Flood Portal

It's a new 'one-stop shop' web portal providing guidance and information on flood risk management in the UK. Arup have written and designed the site, in conjunction with CIRIA, the Local Government Association, the EA and Defra, primarily as a resource for local authority officers, flood risk management professionals, and others with an interest in flood risk. It's a part of the Capacity Building Strategy.http://www.local.gov.uk/floodportal

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.

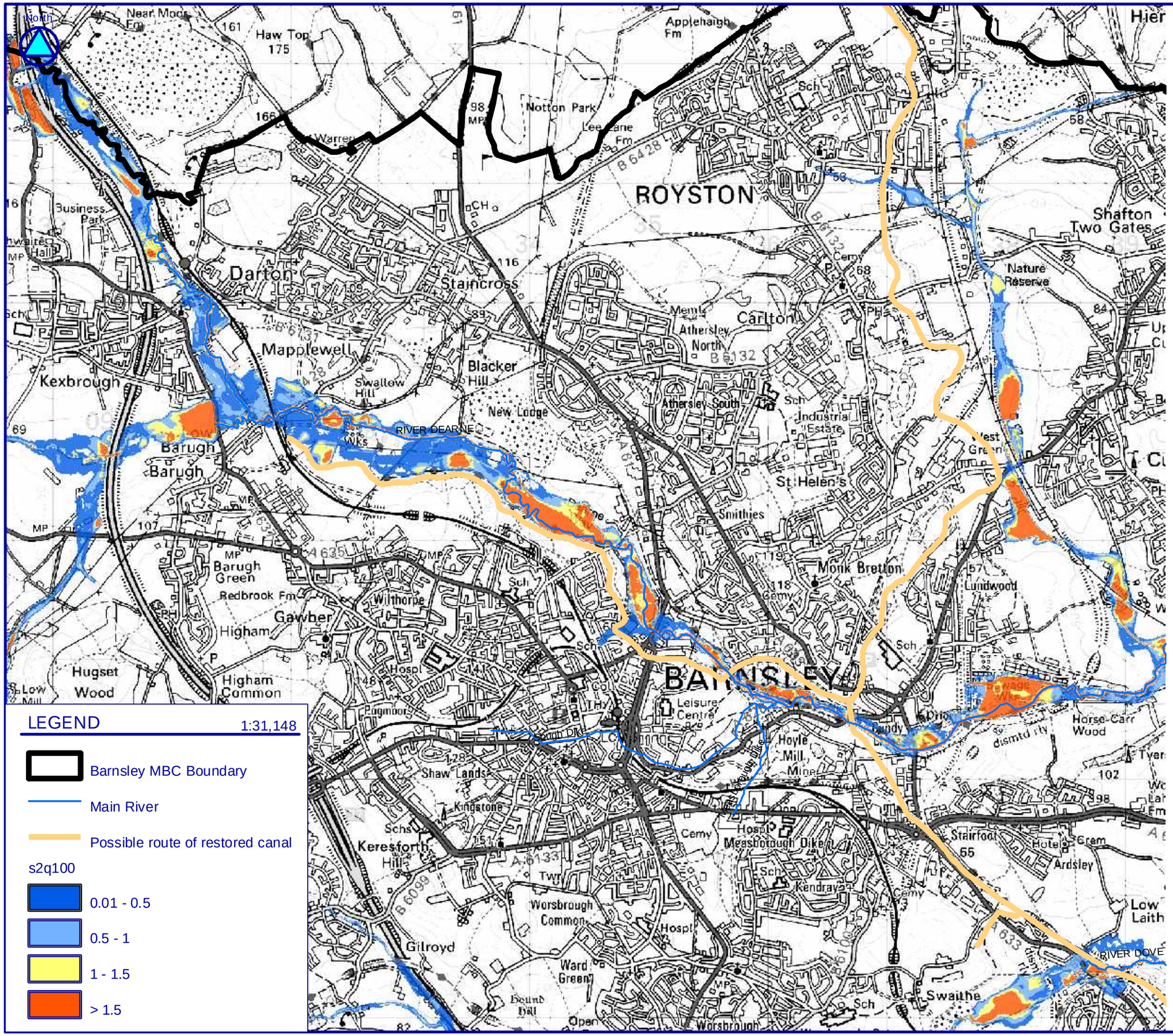
Who should I contact for further information?

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

APPENDIX E – LLFA MAPPING



LEGEND

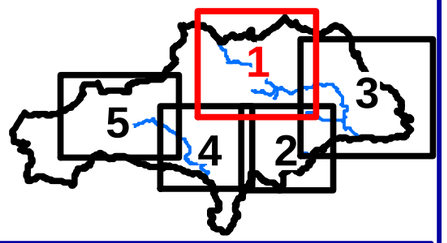
1:31,148

- Barnsley MBC Boundary
- Main River
- Possible route of restored canal

s2q100

- 0.01 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5

KEYPLAN



Note:
This map shows the potential scale of flood inundation for a range of severe overtopping flood events and different standards of flood defence. They do not include the impact of a breach or failure of these defences.

Typical range of defence standards for the River Don and Dearne is to protect up to a 1 in 30year (3%) return period.

s2 = 1 in 2year Standard of Defence
q100 = 1 in 100year or 1% probability flood event.

This map should be considered in support of the Environment Agency Flood Zone Maps to aid the Sequential and Exception Tests.
It should not be considered in isolation without reference to the other SFRA Flood Risk Maps.

Please see the Section 6 of the SFRA for further details.

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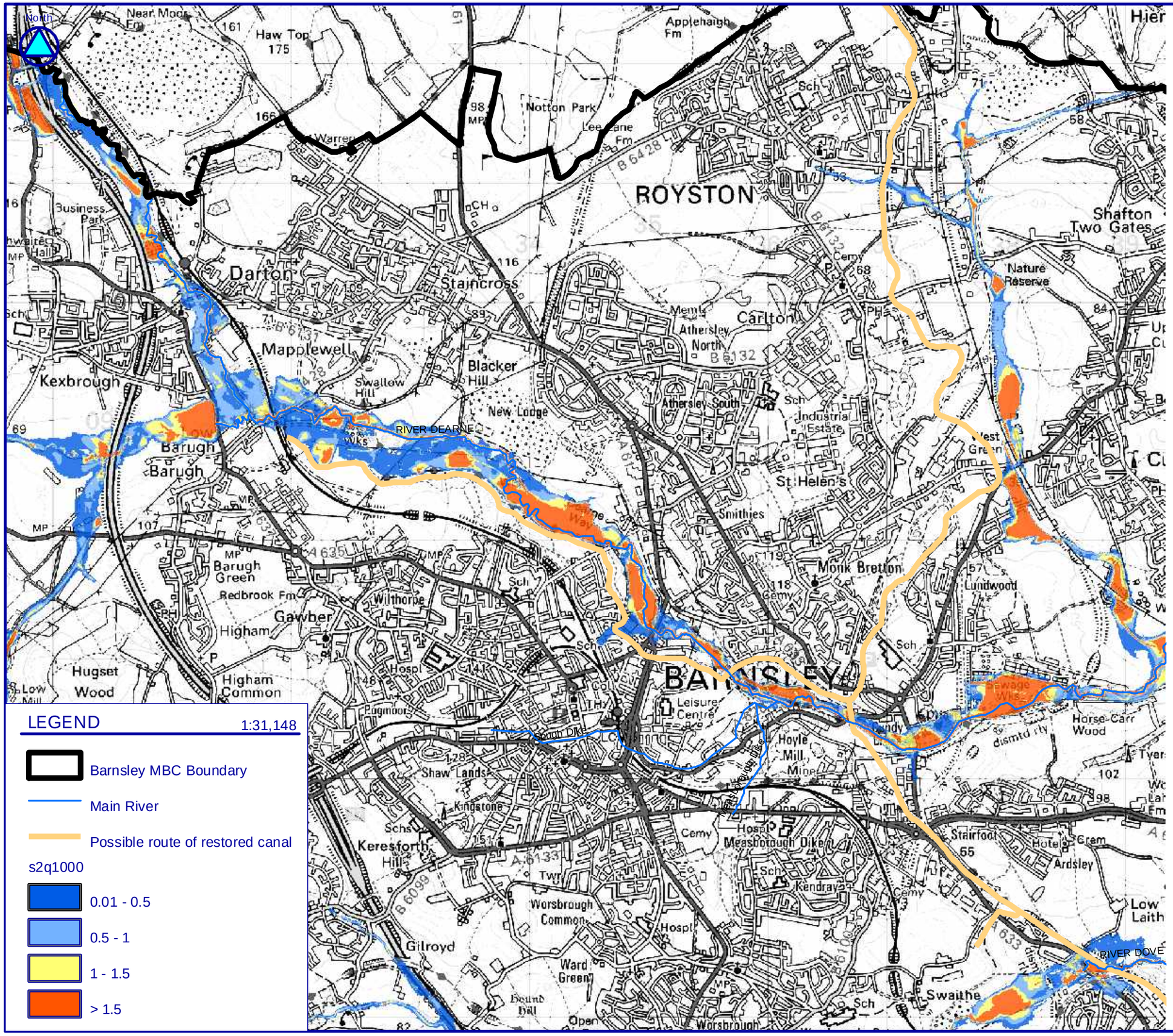
MAP D - 1

s2q100



LEGEND

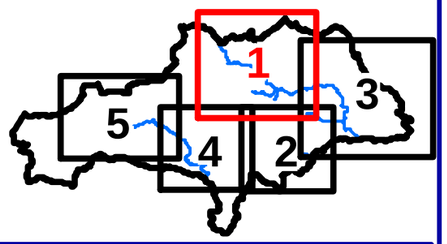
1:31,148

- Barnsley MBC Boundary
- Main River
- Possible route of restored canal

s2q1000

- 0.01 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5

KEYPLAN



Note:
This map shows the potential scale of flood inundation for a range of severe overtopping flood events and different standards of flood defence. They do not include the impact of a breach or failure of these defences.

Typical range of defence standards for the River Don and Dearne is to protect up to a 1 in 30year (3%) return period.

s2 = 1 in 2year Standard of Defence
q1000 = 1 in 1000year or 0.1% probability flood event.

This map shoudl be considered in support of the Environment Agency Flood Zone Maps to aid the Sequential and Exeption Tests.
It should not be considered in isolation without reference to the other SFRA Flood Risk Maps.

Please see the Section 6 of the SFRA for further details.

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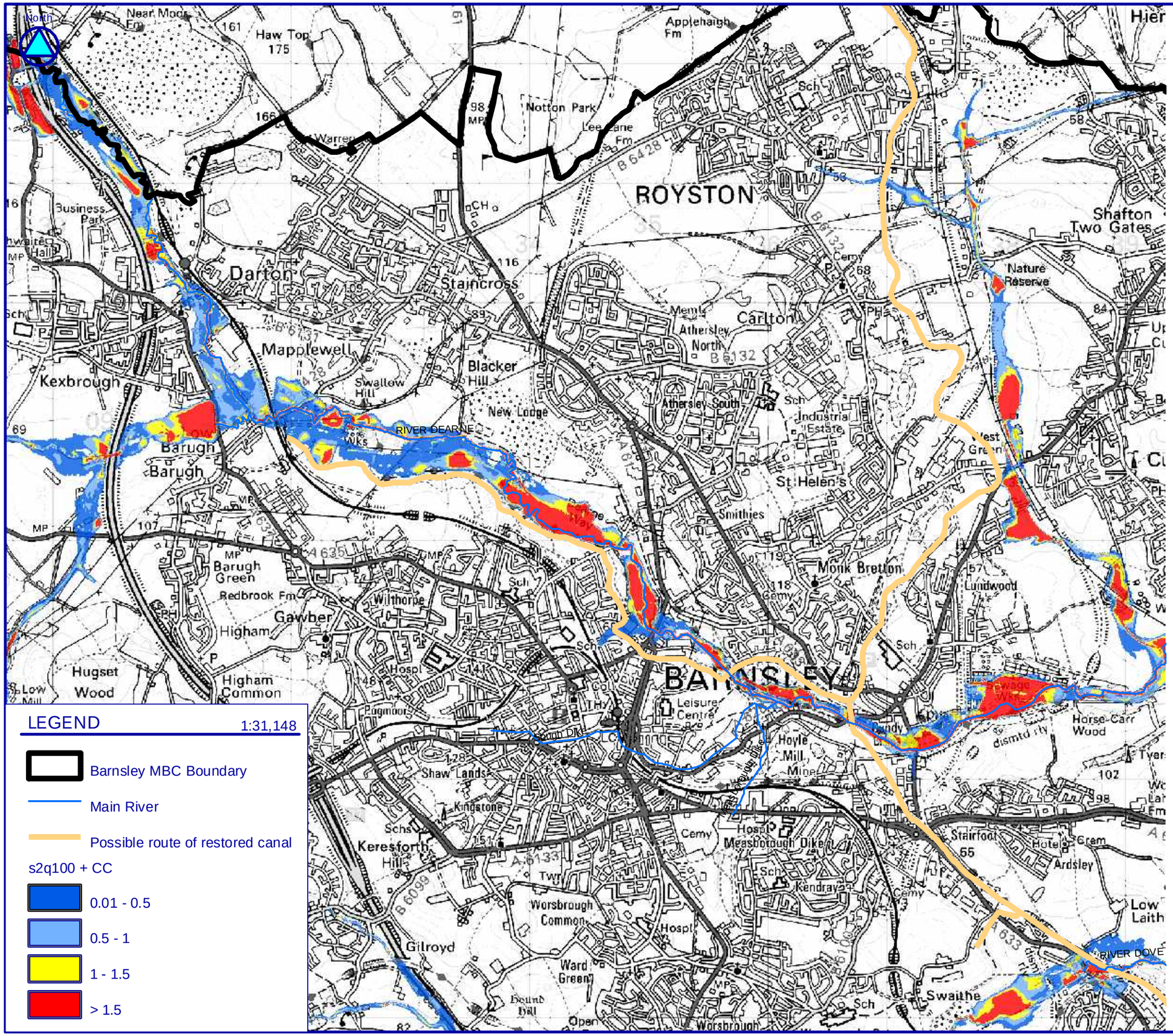
MAP E - 1

s2q1000



LEGEND

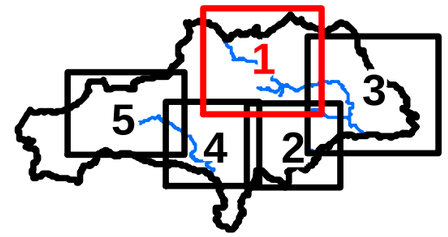
1:31,148

- Barnsley MBC Boundary
- Main River
- Possible route of restored canal

s2q100 + CC

- 0.01 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5

KEYPLAN



Note:
This map shows the potential scale of flood inundation for a range of severe overtopping flood events and different standards of flood defence. They do not include the impact of a breach or failure of these defences.

Typical range of defence standards for the River Don and Dearne is to protect up to a 1 in 30year (3%) return period.

s2 = 1 in 2year Standard of Defence
q100 = 1 in 100year or 1% probability flood event.
Climate Change scenario represents 20% increase of flood flow.

This map should be considered in support of the Environment Agency Flood Zone Maps to aid the Sequential and Exception Tests.
It should not be considered in isolation without reference to the other SFRA Flood Risk Maps.

Please see the Section 6 of the SFRA for further details.

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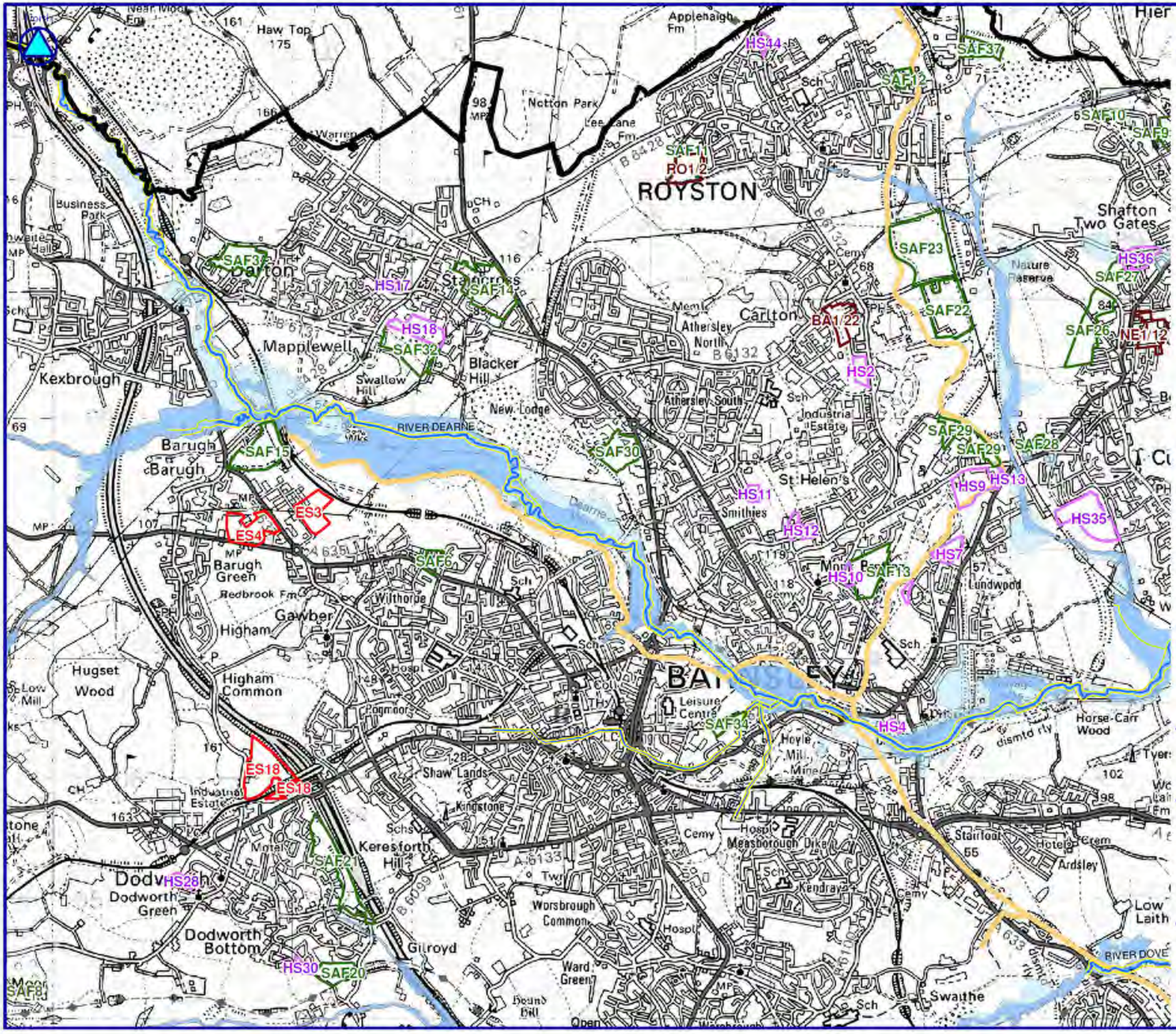
MAP H - 1

s2q100 + Climate Change



KEYPLAN

LEGEND

1:30,809

- Barnsley MBC Boundary
- Defence
- Main River
- Possible route of restored canal
- Flood Zone 3
- Flood Zone 2

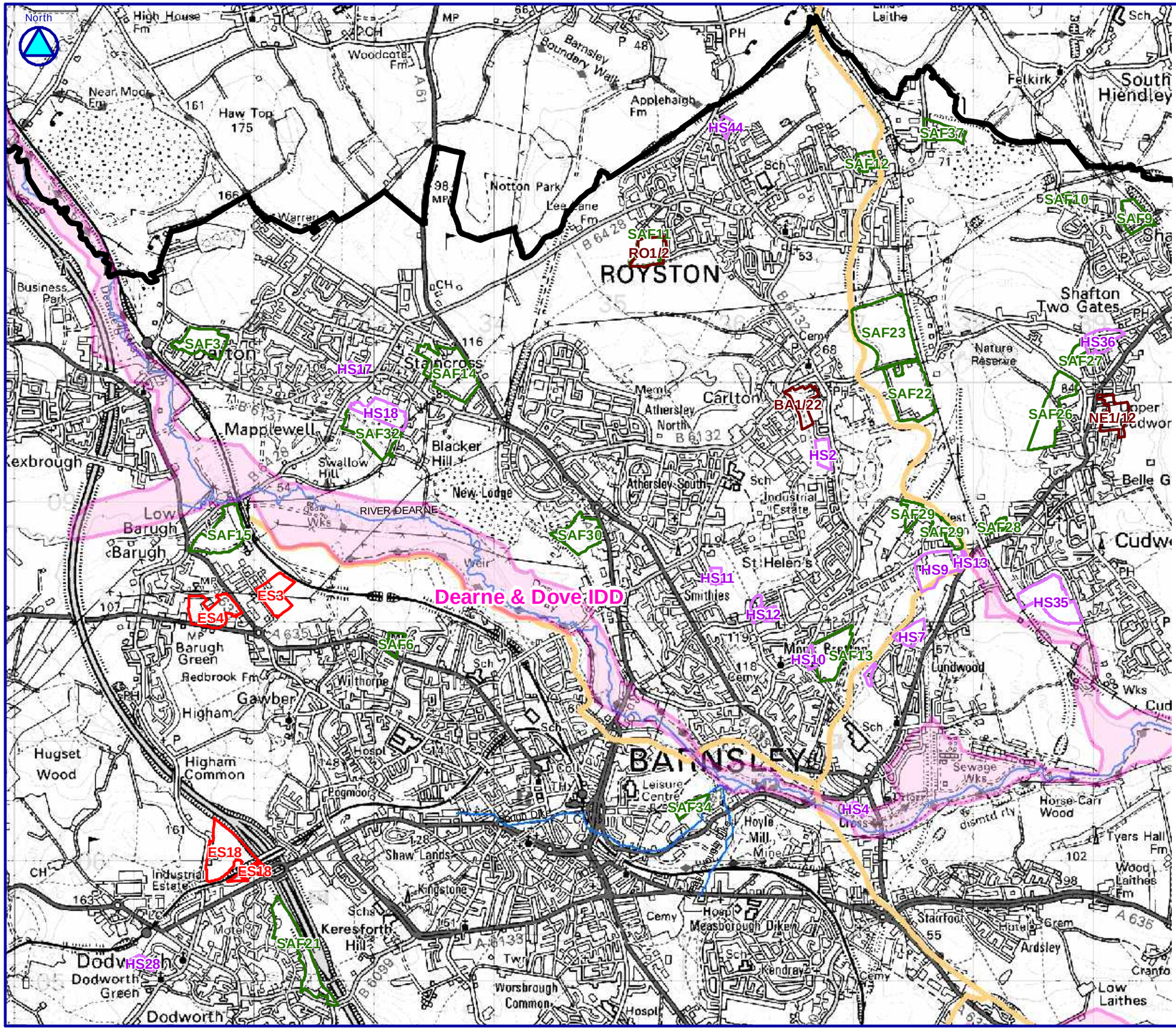
Proposed Development Sites

- Employment Sites
- Housing Sites
- UDP Sites
- Safeguarded Land

jba consulting

MAP A - 1

PROPOSED DEVELOPMENT SITES AND FLOOD ZONES



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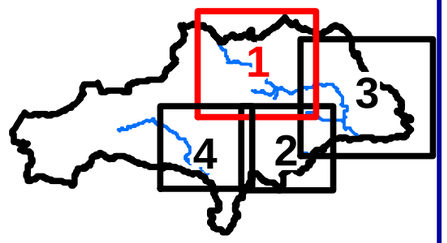

LEGEND

1:30,809

- Barnsley MBC Boundary
- IDB Boundaries
- Main River
- Possible route of restored canal

Proposed Development Sites

- Employment Sites
- Housing Sites
- UDP Sites
- Safeguarded Land

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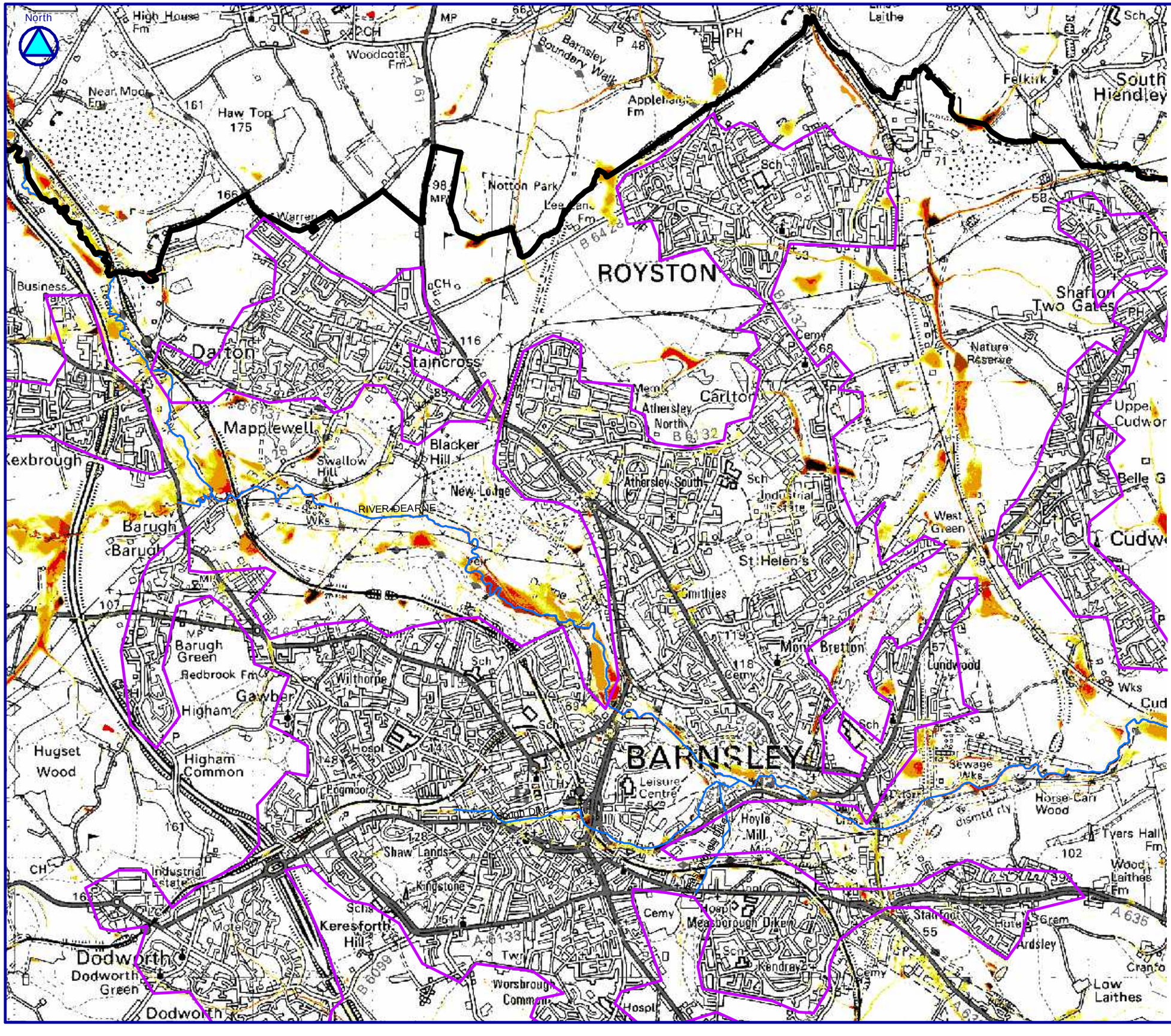
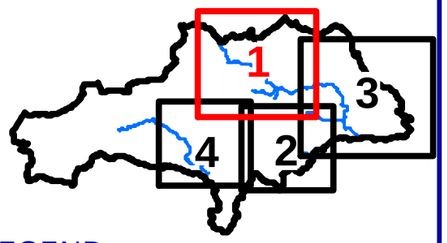
MAP B - 1

PROPOSED DEVELOPMENT SITES AND IDB BOUNDARIES



KEYPLAN



LEGEND

1:30,809

- Barnsley MBC Boundary
- Urban Areas
- Main River

Surface Water Flooding

Flood Depth (m)

- 0.15 - 0.3
- 0.3 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1 - 2
- > 2

Note:
Please see Section 5.8 of the SFRA for further details.

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MAP C - 1

PLUVIAL FLOODING CAUSED BY 100YEAR RAINSTORM

APPENDIX F – FLOOD MAPS AND GEOLOGY PLANS

Flood Map for Planning
Source Protection Zone Map
Groundwater Vulnerability Map
Aquifer Designation (Drift) Map
Aquifer Designation (Bedrock) Map

Flood map for planning

Your reference	Location (easting/northing)	Created
Shaw Lane	**437343/410320**	**22 Nov 2021 18:12**

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

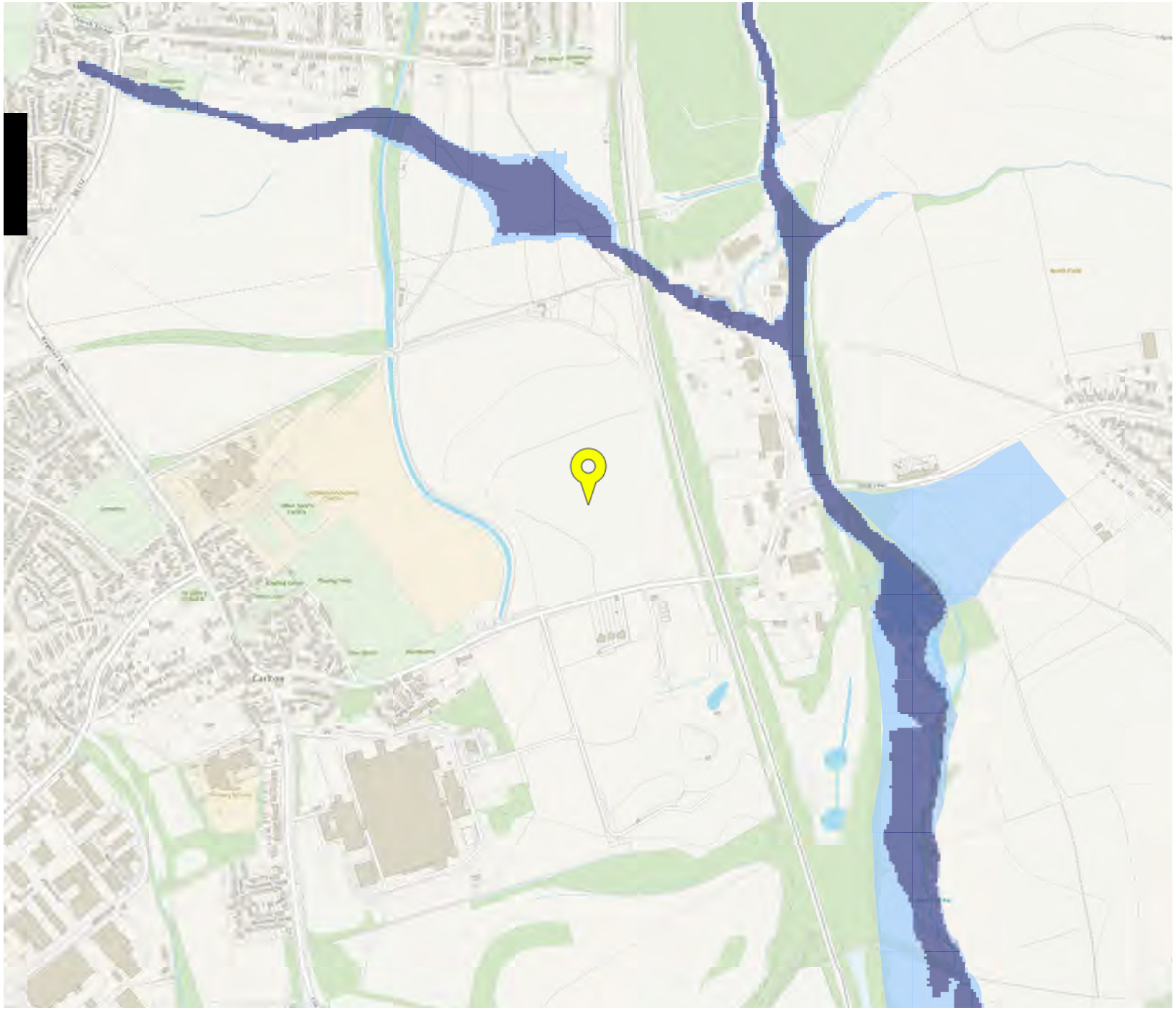
This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

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.



Shaw Lane

437343/410320

1:10000

22 Nov 2021 18:12

0 100 200 300m

Shaw Lane

Legend

- Drinking Water Protected Areas (Surface Water) (England)
- Drinking Water Safeguard Zones (Surface Water) (England)
- Drinking Water Safeguard Zones (Groundwater) (England)

Source Protection Zones merged (England)

- Zone I - Inner Protection Zone
- Zone I - Subsurface Activity
- Zone II - Outer Protection Zone
- Zone II - Subsurface Activity
- Zone III - Total Catchment
- Zone III - Subsurface Activity
- Zone of Special Interest

Projection = OSGB36
xmin = 403000
ymin = 393900
xmax = 463500
ymax = 428200

0 1.5 3 km

Map produced by MAGIC on 19 July, 2019.

Shaw Lane

Legend

Groundwater Vulnerability Map (England)

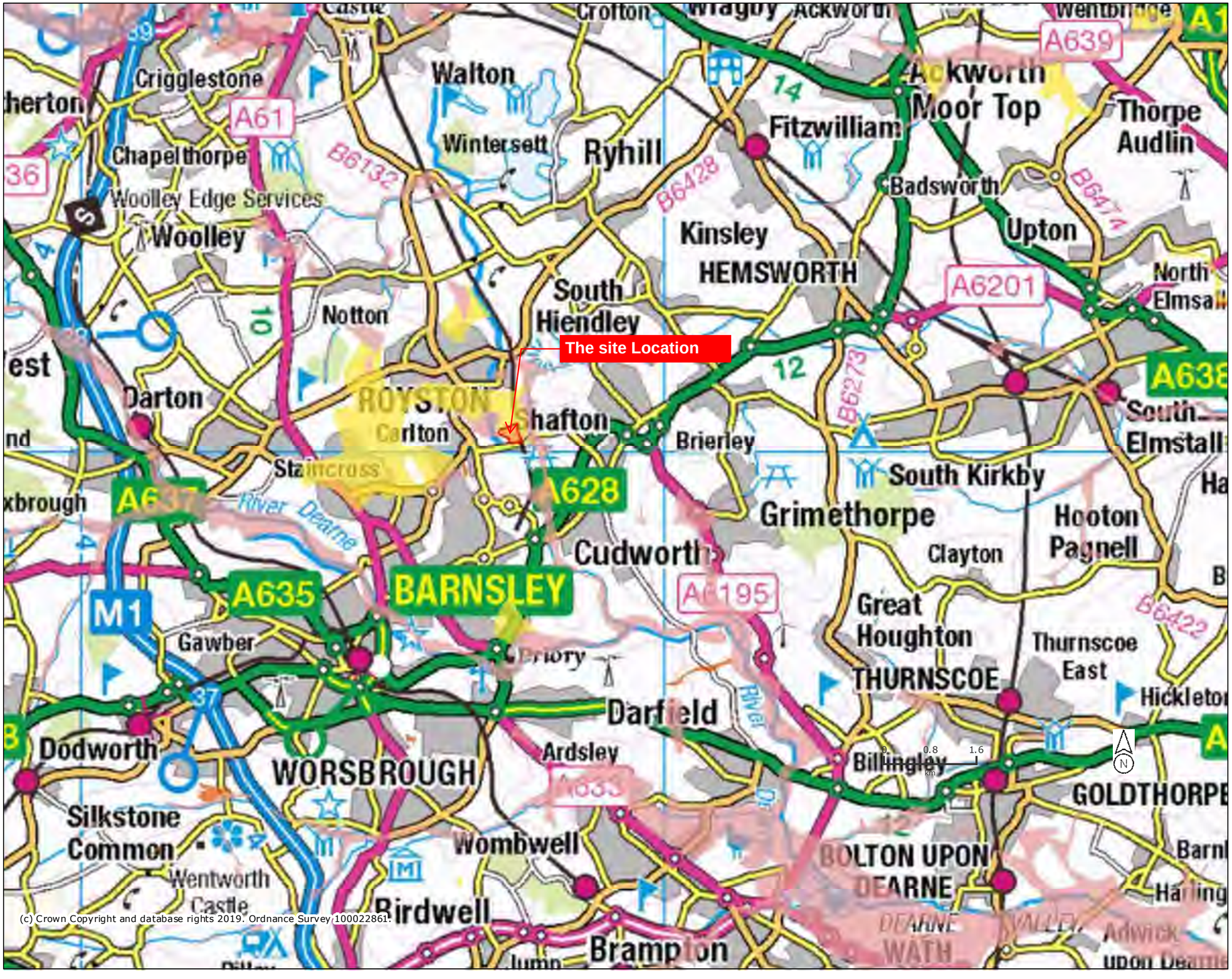
- Major Aquifer High
- Major Aquifer Intermediate
- Major Aquifer Low
- Minor Aquifer High
- Minor Aquifer Intermediate
- Minor Aquifer Low

Projection = OSGB36
xmin = 417200
ymin = 397200
xmax = 460800
ymax = 422000

0 1 2
km

Map produced by MAGIC on 19 July, 2019.

Shaw Lane



Legend

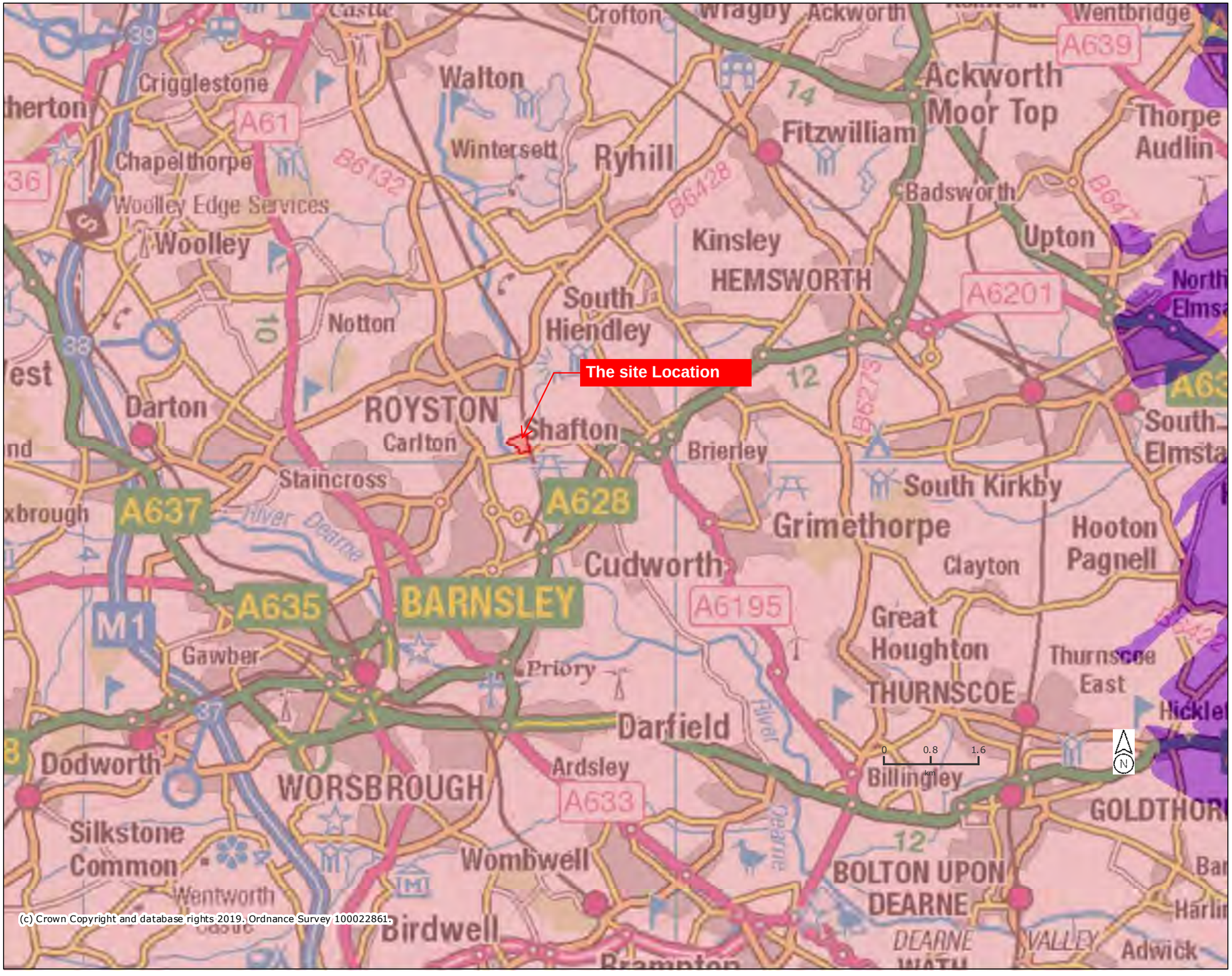
Aquifer Designation Map (Superficial Drift) (England)

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unknown (lakes+landslip)
- Unproductive

Projection = OSGB36
xmin = 417000
ymin = 396900
xmax = 461300
ymax = 422000

Map produced by MAGIC on 19 July, 2019.

Shaw Lane



(c) Crown Copyright and database rights 2019. Ordnance Survey 100022861.

Legend

Aquifer Designation Map (Bedrock) (England)

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unproductive

Projection = OSGB36
xmin = 417200
ymin = 397200
xmax = 460800
ymax = 422000

0 1 2
km

Map produced by MAGIC on 19 July, 2019.

Shaw Lane

Legend

Soilscape (England)

- 1 - Saltmarsh soils
- 2 - Shallow very acid peaty soils over rock
- 3 - Shallow lime-rich soils over chalk or limestone
- 4 - Sand dune soils
- 5 - Freely draining lime-rich loamy soils
- 6 - Freely draining slightly acid loamy soils
- 7 - Freely draining slightly acid but base-rich soils
- 8 - Slightly acid loamy and clayey soils with impeded drainage
- 9 - Lime-rich loamy and clayey soils with impeded drainage
- 10 - Freely draining slightly acid sandy soils
- 11 - Freely draining sandy breckland soils
- 12 - Freely draining floodplain soils
- 13 - Freely draining acid loamy soils over rock
- 14 - Freely draining very acid sandy and laomy soils
- 15 - Naturally wet very acid sandy and loamy soils
- 16 - Very acid loamy upland soils with a wet peaty surface
- 17 - Slowly permeable seasonally wet acid loamy and clayey soils
- 18 - Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils
- 19 - Slowly permeable wet very acid upland soils with a peaty surface
- 20 - Loamy and clayey floodplain soils with naturally high groundwater
- 21 - Loamy and clayey soils of coastal flats with naturally high groundwater
- 22 - Loamy soils with naturally high groundwater
- 23 - Loamy and sandy soils with naturally high groundwater and a peaty surface
- 24 - Restored soils mostly from quarry and opencast spoil
- 25 - Blanket bog peat soils
- 26 - Raised bog peat soils
- 27 - Fen peat soils
- 28 - Sea
- 30 - UC
- 31 - Water

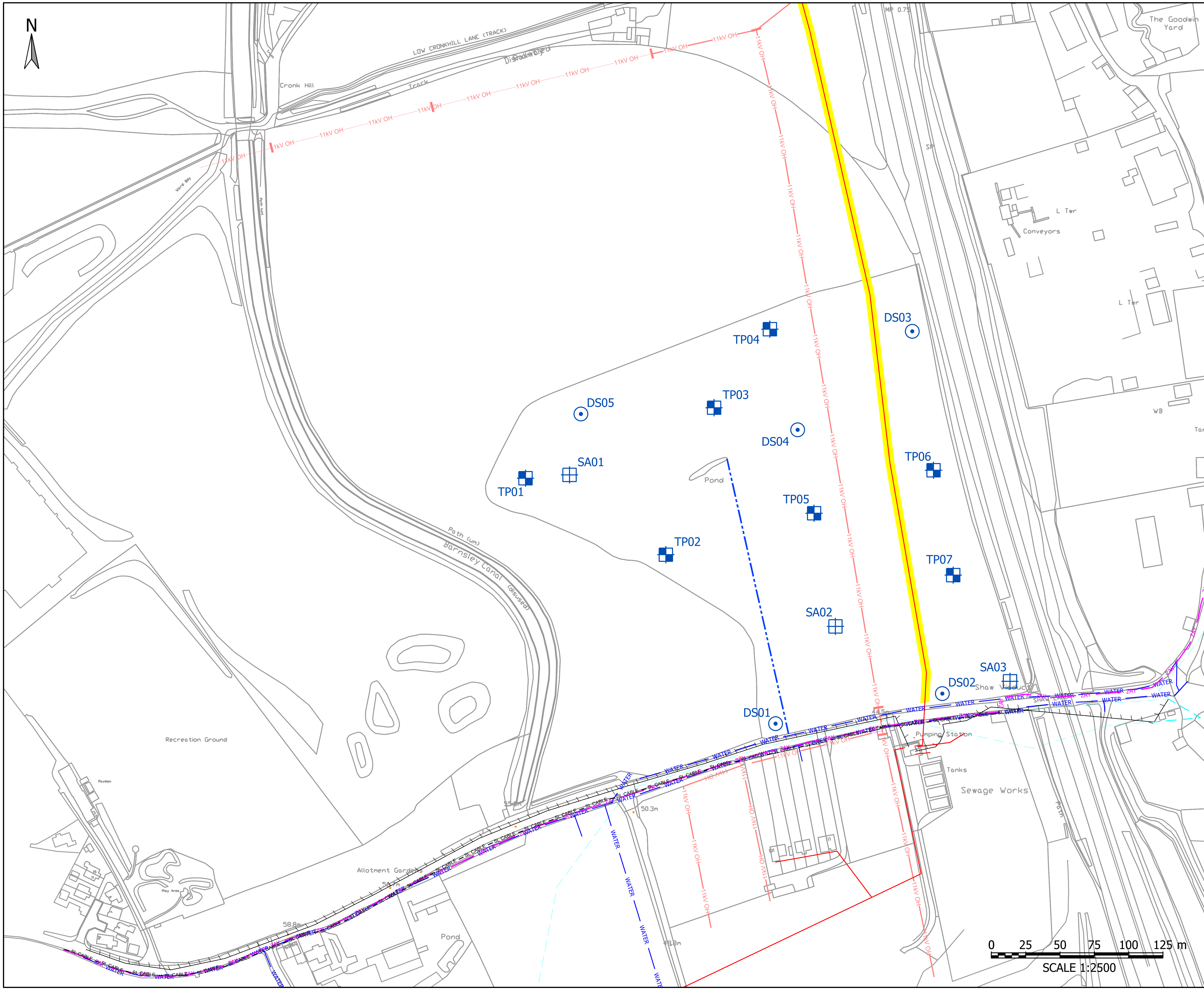
Projection = OSGB36
xmin = 418900
ymin = 398200
xmax = 459100
ymax = 421000

0 1 2
km

Map produced by MAGIC on 19 July, 2019.

APPENDIX G – SURFACE WATER DRAINAGE ASSESSMENT

Infiltration Assessment
Greenfield Runoff Rate
Surface Water Storage



KEY:

EXISTING SERVICES

BT	TELECOMS BT (EXG)
BT OH	TELECOMS BT OVERHEAD LINES (EXG)
WATER	WATER MAINS (EXG)
TRUNK	WATER TRUNK MAINS (EXG)
	FOUL WATER SEWER RUN (EXG)
	SURFACE WATER SEWER RUN (EXG)
	3m SEWER EASEMENT (EXG)
	COMBINED SEWER (EXG)
	COMBINED WATER RISING MAIN (EXG)
NG	NATIONAL GRID CABLES (EXG)
LVP	LV ELECTRICITY CABLES (EXG)
HV	HV ELECTRICITY CABLES (EXG)
11kV OH	HV 11kV ELECTRICITY CABLES
EHV	EHV ELECTRICITY CABLES (EXG)
SL CABLE	STREET LIGHTING LV ELECTRICITY CABLES (EXG)
GAS	GAS (EXG)
GLP	GAS LOW PRESSURE (EXG)
GMP	GAS MEDIUM PRESSURE (EXG)
GAS	GAS HIGH PRESSURE (EXG)
COMMS	VIRGIN MEDIA TELECOMS (EXG)
	DUCTS (EXG)
INS	LEVEL 3, GLOBAL CROSSING (UK) LTD, GLOBAL CROSSING PEC and FIBERNET UK LTD (EXG)
VER	VERIZONE (EXG)
ZAY	ZAYO (EXG)
	BELOW GROUND DRAIN (APPROXIMATELY 18"ø)

TETRA TECH GROUND INVESTIGATION 2021

- TRIAL PIT
- DYNAMIC SAMPLE BOREHOLE
- SOAKAWAY TEST
- SOAKAWAY TEST SUBJECT TO GROUND CONDITIONS

FOR INFORMATION ONLY

Rev	Description	Date	Drn / Chk / App		
01	FIRST ISSUE	02.11.21	CM	NB	NB

Document Control

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TETRA TECH

Client

network space

Project Name

SHAW LANE
BARNSLEY

Sheet Title

EXPLORATORY HOLE LOCATION PLAN

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A3	Suitability
B029129	CM	06.09.21	NB	02.11.21	NB	02.11.21	1:2,500	S2

Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision
B029129	TTE	00	XX	DR	U	0002	01

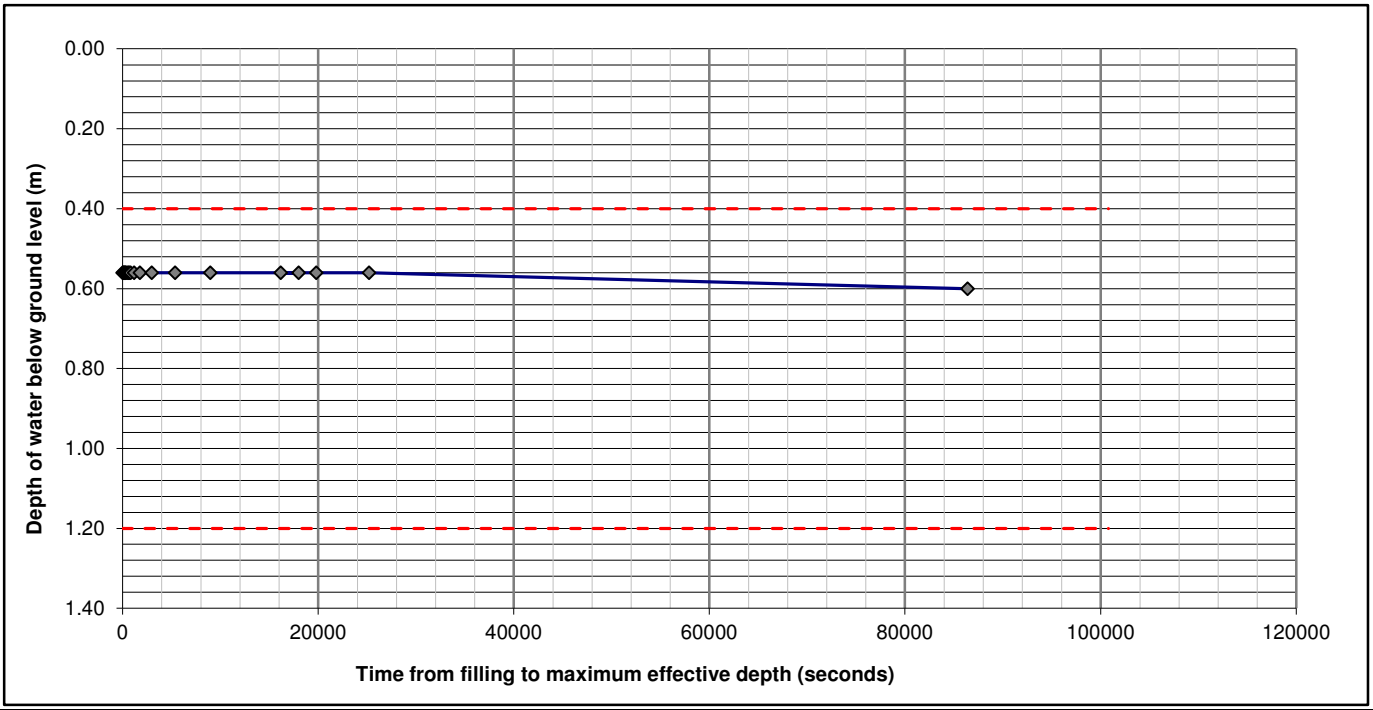
 TTE_MT_v1

WYG Environment

Environmental Consultancy
Ground Engineering Services

DATE:	14/09/2021
PROJECT No:	B029129
PROJECT NAME:	Shaw Lane, Carlton
CLIENT:	Network Space
TRIAL PIT ID:	SA01
TEST NUMBER:	1

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION



Time Elapsed (s)	Time Elapsed (mins)	Distance to water surface from ground level (m)
0	0.00	
30	0.50	0.560
90	1.50	0.560
150	2.50	0.560
210	3.50	0.560
270	4.50	0.560
360	6.00	0.560
480	8.00	0.560
600	10.00	0.560
720	12.00	0.560
840	14.00	0.560
1200	20.00	0.560
1800	30.00	0.560
3000	50.00	0.560
5400	90.00	0.560
9000	150.00	0.560
18000	300.00	0.560
16200	270.00	0.560
19800	330.00	0.560
25200	420.00	0.560
86400	1440.00	0.600
100800	1680.00	0.600

PIT LENGTH (m):	2.70	**Pit construction**
PIT WIDTH (m):	0.60	TEREX TML 32 - Wheeled Excavator
PIT DEPTH (m):	1.60	

INPUT PARAMETERS:

Total volume of pit	(m^3)	2.59
Pit volume between 75% and 25% depths = L x W x ½D	(m^3)	1.30
Effective depth of Pit	(m)	1.60
Proportion of pit volume occupied by gravel solids	(0-1)	0.00
Maximum potential volume of Water	(m^3)	2.59
Level of water in pit at 75% effective depth (p_{75})	(m)	0.40
Level of water in pit at 25% effective depth (p_{25})	(m)	1.20
Effective volume between 75% & 25% depth $Vp_{75\text{-}25}$ = V x Pg	(m^3)	1.30
Surface area of pit up to 50% effective depth (A_{p50})	(m^2)	6.90
Time at 75% effective depth (p_{75})	(s)	#N/A
Time at 25% effective depth (p_{25})	(s)	#N/A
Time for outflow for 75% and 25% effective depth (Tp75-25)	(s)	#N/A

OUTPUT:

SOIL INFILTRATION RATE (f)	$\frac{V_{p75-25}}{A_{p50} \times T_{p75-25}}$	(m/s)	**#N/A**

WATER INPUT:	Unkown	in	3 Minutes

GEOLOGY OF TEST SECTION:

Light grey mottled with orangish brown sandy silty CLAY.

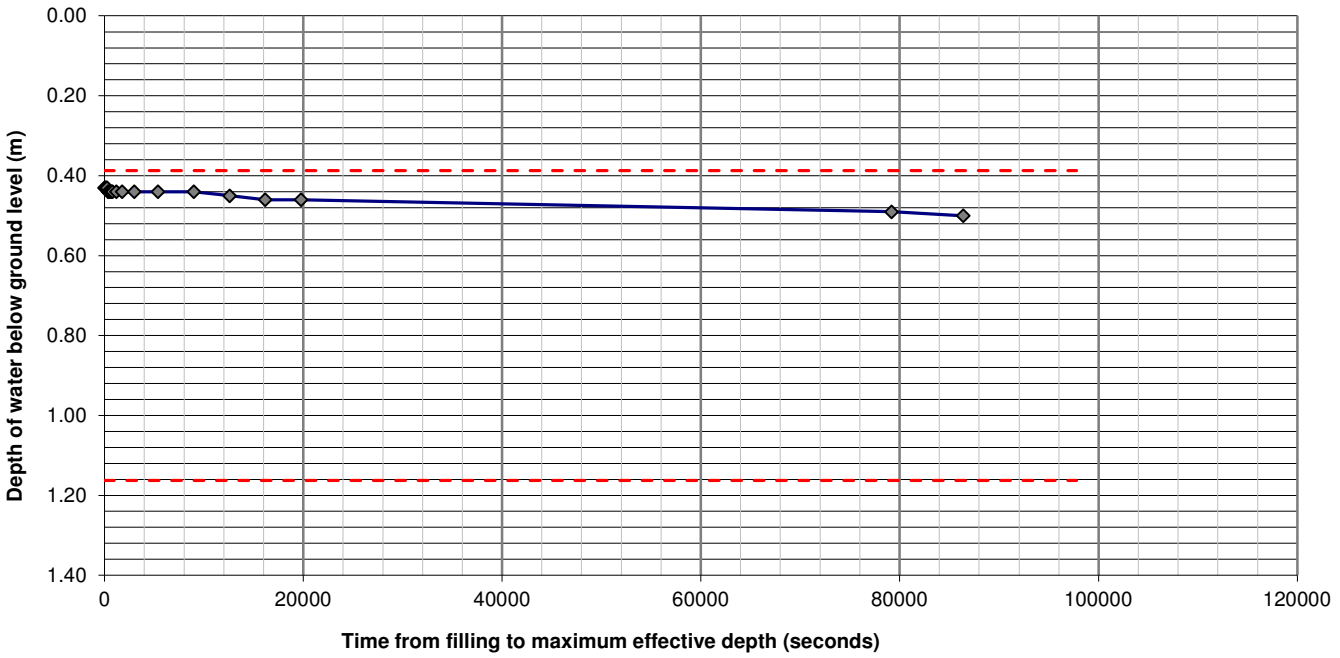
Compiled by:	TB
Checked by:	NB

WYG Environment

Environmental Consultancy
Ground Engineering Services

DATE:	14/09/2021
PROJECT No:	B029129
PROJECT NAME:	Shaw Lane, Carlton
CLIENT:	Network Space
TRIAL PIT ID:	SA02
TEST NUMBER:	1

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION



Time Elapsed (s)	Time Elapsed (mins)	Distance to water surface from ground level (m)
0	0.00	
30	0.50	0.430
90	1.50	0.430
150	2.50	0.430
210	3.50	0.430
270	4.50	0.430
360	6.00	0.440
480	8.00	0.440
600	10.00	0.440
720	12.00	0.440
840	14.00	0.440
1200	20.00	0.440
1800	30.00	0.440
3000	50.00	0.440
5400	90.00	0.440
9000	150.00	0.440
12600	210.00	0.450
16200	270.00	0.460
19800	330.00	0.460
79200	1320.00	0.490
86400	1440.00	0.500
97800	1630.00	0.520

PIT LENGTH (m):	2.60	**Pit construction**
PIT WIDTH (m):	0.50	TEREX TML 32 - Wheeled Excavator
PIT DEPTH (m):	1.55	

INPUT PARAMETERS:

Total volume of pit	(m^3)	2.02
Pit volume between 75% and 25% depths = L x W x ½D	(m^3)	1.01
Effective depth of Pit	(m)	1.55
Proportion of pit volume occupied by gravel solids	(0-1)	0.00
Maximum potential volume of Water	(m^3)	2.02
Level of water in pit at 75% effective depth (p_{75})	(m)	0.39
Level of water in pit at 25% effective depth (p_{25})	(m)	1.16
Effective volume between 75% & 25% depth $Vp_{75\text{-}25}$ = V x Pg	(m^3)	1.01
Surface area of pit up to 50% effective depth (A_{p50})	(m^2)	6.11
Time at 75% effective depth (p_{75})	(s)	#N/A
Time at 25% effective depth (p_{25})	(s)	#N/A
Time for outflow for 75% and 25% effective depth (Tp75-25)	(s)	#N/A

OUTPUT:

SOIL INFILTRATION RATE (f)	$\frac{V_{p75-25}}{A_{p50} \times T_{p75-25}}$	(m/s)	**#N/A**

WATER INPUT: Unkown in 2.5 minutes

GEOLOGY OF TEST SECTION:

Light grey mottled with orangish brown slightly sandy gravelly silty CLAY.

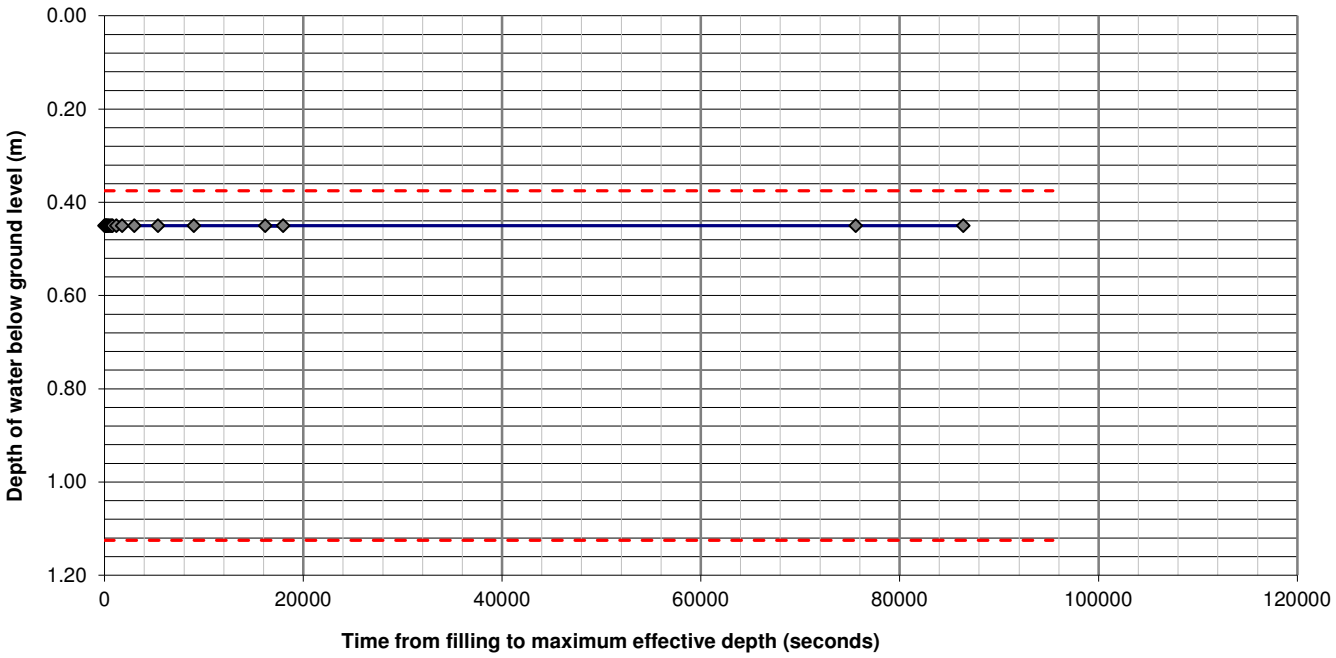
Compiled by: TB
Checked by: NB

WYG Environment

Environmental Consultancy
Ground Engineering Services

DATE:	14/09/2021
PROJECT No:	B029129
PROJECT NAME:	Shaw Lane, Carlton
CLIENT:	Network Space
TRIAL PIT ID:	SA03
TEST NUMBER:	1

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION



Time Elapsed (s)	Time Elapsed (mins)	Distance to water surface from ground level (m)
0	0.00	
30	0.50	0.450
90	1.50	0.450
150	2.50	0.450
210	3.50	0.450
270	4.50	0.450
360	6.00	0.450
480	8.00	0.450
600	10.00	0.450
720	12.00	0.450
840	14.00	0.450
1200	20.00	0.450
1800	30.00	0.450
3000	50.00	0.450
5400	90.00	0.450
9000	150.00	0.450
18000	300.00	0.450
16200	270.00	0.450
75600	1260.00	0.450
86400	1440.00	0.450
95400	1590.00	0.450

PIT LENGTH (m):	2.80	**Pit construction**
PIT WIDTH (m):	0.55	TEREX TML 32 - Wheeled Excavator
PIT DEPTH (m):	1.50	

INPUT PARAMETERS:

Total volume of pit	(m^3)	2.31
Pit volume between 75% and 25% depths = L x W x ½D	(m^3)	1.16
Effective depth of Pit	(m)	1.50
Proportion of pit volume occupied by gravel solids	(0-1)	0.00
Maximum potential volume of Water	(m^3)	2.31
Level of water in pit at 75% effective depth (p_{75})	(m)	0.38
Level of water in pit at 25% effective depth (p_{25})	(m)	1.13
Effective volume between 75% & 25% depth $Vp_{75\text{-}25}$ = V x Pg	(m^3)	1.16
Surface area of pit up to 50% effective depth (A_{p50})	(m^2)	6.57
Time at 75% effective depth (p_{75})	(s)	#N/A
Time at 25% effective depth (p_{25})	(s)	#N/A
Time for outflow for 75% and 25% effective depth (Tp75-25)	(s)	#N/A

OUTPUT:

SOIL INFILTRATION RATE (f)	$\frac{V_{p75-25}}{A_{p50} \times T_{p75-25}}$	(m/s)	**#N/A**

WATER INPUT: Unkown in 2.5 minutes

GEOLOGY OF TEST SECTION:

Light grey mottled with orangish brown sandy silty CLAY.

Compiled by: TB
Checked by: NB

KEY

SURFACE WATER SEWER AND MANHOLE

INDICATIVE LOCATION OF EXISTING SURFACE WATER SEWER

EXISTING DITCH / ORDINARY WATERCOURSE

FOUL SEWER AND MANHOLE

INDICATIVE LOCATION OF EXISTING COMBINED SEWER EASEMENT

POND WITH RETAINED WATER LEVEL.

DETENTION BASIN - DETAINED VOLUME 1359m³ AT 0.5m DEPTH ABOVE REDUCED GROUND LEVEL.

TOTAL VOLUME OF DETENTION BASINS 2154m³.

VOLUME TO BE PROVIDED WITHIN PIPE DRAINAGE SYSTEM USING OVERSIZE PIPES 1699m³.

TOTAL ATTENUATION VOLUME 3853m³.

FOR INFORMATION ONLY

Rev	Description	Date	Drn	Chk	App
P04	DRAINAGE OUTFALL REVISED	5.5.22	DH	GM	GM
P03	SITE LAYOUT REVISED	21.1.22	DH	GM	GM
P02	STORAGE LOCATIONS REVISED	27.9.21	GM	GM	APF
P01	FLOOD RISK ASSESSMENT	23.9.21	GM	GM	APF

Document Control

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Client

network space

Project Name

SHAW LANE
CARLTON

Sheet Title

INDICATIVE SITE DRAINAGE

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A1	Suitability
B029129	GM	SEP 21	DH	SEP 21	APF	SEP 21	1:1000	S0

Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision
B029129	TET	XX	XX	SK	-	0001	P04

TTE_MT_v3

Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:	Graham Mawdsley
Site name:	Shaw Lane
Site location:	Carlton

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	53.58794° N
Longitude:	1.43745° W
Reference:	628475627
Date:	Jan 20 2022 14:26

Site characteristics

Total site area (ha):	7.5
Significant public open space (ha):	1.746
Area positively drained (ha):	5.754
Impermeable area (ha):	3.794
Percentage of drained area that is impermeable (%):	66
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	5.75
Net impermable area for storage volume design (ha):	4.07
Pervious area contribution to runoff (%):	30

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	1.4
Urban creep allowance factor:	1.1
Volume control approach	Flow control to max of 2 l/s/ha or Qbar
Interception rainfall depth (mm):	5
Minimum flow rate (l/s):	24.5

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
SPR:	0.47	0.47

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	63
Rainfall 100 yrs 12 hrs:	--	83.93
FEH / FSR conversion factor:	1.09	1.09
SAAR (mm):	628	628
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.4	0.4
Hydological region:	3	3
Growth curve factor 1 year:	0.86	0.86
Growth curve factor 10 year:	1.45	1.45
Growth curve factor 30 year:	1.75	1.75
Growth curve factor 100 years:	2.08	2.08
Q_{BAR} for total site area (l/s):	31.89	31.89
Q_{BAR} for net site area (l/s):	24.47	24.47

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	24.5	24.5	Attenuation storage 1/100 years (m^3):	3759	3759
1 in 30 years (l/s):	24.5	24.5	Long term storage 1/100 years (m^3):	0	0
1 in 100 year (l/s):	24.5	24.5	Total storage 1/100 years (m^3):	3759	3759

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Graham Mawdsley
Site name:	Shaw Lane
Site location:	Carlton

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	53.58782° N
Longitude:	1.43723° W
Reference:	3748284790
Date:	Jan 20 2022 14:10

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 7.5

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics	Default	Edited
SAAR (mm):	628	628
Hydrological region:	3	3
Growth curve factor 1 year:	0.86	0.86
Growth curve factor 30 years:	1.75	1.75
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	31.89	31.89
1 in 1 year (l/s):	27.43	27.43
1 in 30 years (l/s):	55.81	55.81
1 in 100 year (l/s):	66.33	66.33
1 in 200 years (l/s):	75.58	75.58