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Prepared on behalf of

Farnley Estates Ltd

FLOOD RISK ASSESSMENT

Proposed Development
Farnley Tyas, Huddersfield

Allocation 06

Flood Risk Overview

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ISO 9001 REGISTERED FIRM

Acknowledgements:

Environment Agency

Disclaimer

The methodology adopted and the sources of information used by Sanderson Associates (Consulting Engineers) Ltd in providing its services are outlined within this Report.

Any information provided by third parties and referred to herein has not been checked or verified by Sanderson Associates (Consulting Engineers) Ltd, unless otherwise expressly stated within this report.

This report was checked and approved on the 19 January 2016 and the Report is therefore valid on this date, circumstances, regulations and professional standards do change which could subsequently affect the validity of this Report.

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Report Ref:	9069/DH/005/01		January 2016
Author:	Darren Hawkyard		
Checked & Approved:	Thomas Walker	**Date:**	19 January 2016

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1 Introduction

1.1 Sanderson Associates (Consulting Engineers) Ltd have been appointed to undertake a Flood Risk Overview for possible development sites Farnley Tyas, Huddersfield. The aim of this assessment is to discuss the present and future flood risk to the site and to assess possible uses and mitigation measures required. The location of the site is shown on drawing 9069/001 contained in Appendix A.

1.2 This Flood Risk Assessment has been undertaken in accordance with the National Planning Policy Framework (NPPF) March 2012 and the associated Planning Practice Guidance, 2014.

1.3 Consultation with Environment Agency (EA) has taken place. The consultation response is discussed in Section 3 and contained within Appendix B.

1.4 Each site allocation will be separated into individual reports and assessed on their own merits. A site Location plan showing each of the site allocations is located in Appendix A.

2 Existing Situation

2.1 Existing Site Description

2.1.1 The site is currently open fields and located to the south of Beldon Brook Green, Huddersfield. Drawing 9069/001 included in Appendix A shows the site limits and location.

2.1.2 Access is currently gained from Beldon Brook Green via a wooden gated field access.

2.1.3 The site is bound by Beldon Brook Green to the north with an adjoining field bounding the site to the east. A private development bounds the site to the west with Beldon Brook to the south.

2.1.4 The closest main river is the Beldon Brook which is located upon the southern boundary of the site.

2.2 Existing Site Analysis

2.2.1 The site area is 50,679m² (5.06Ha) taken from information provided by the client is considered to be permeable (not positively drained). Therefore the site is considered to be 0% impermeable and 100% permeable.

2.2.2 The estimated Greenfield surface water runoff rate from the site has been assessed using WinDES Source Control software. The run off rate has been calculated at 11.10l/s or 2.19l/s/Ha for a 1 in 1 year return period (IH124 Method requires calculations based on 50Ha reduced to the site area). The WinDES output files are contained within Appendix C.

2.2.3 The topography of the site generally grades from south to north. Levels range from approximately 106.0m AOD at the north eastern corner of the site to 91.00m AOD upon the southern boundary of the site.

3 Consultations

3.1 As part of this assessment, the Environment Agency (EA) information has been reviewed in relation to flood zones and groundwater. All responses are contained in Appendix B.

3.2 The response from the Environment Agency confirms that the site falls within Flood Zones 1,2 and 3 with the worst case scenario of a 1 in 100 or greater annual probability of river flooding (>1%).

3.3 The Environment Agency provided modelled flood levels for the Fenay Beck in the vicinity of the site. These include levels for the 1 in 100 + climate change and 1 in 1000 year events. There are no flood defences in close proximity to the site.

3.4 The Environment Agency have provided historic flooding maps and shows that the site was not subject to historic flooding.

3.5 The Environment Agency website show that the site is not within a Groundwater Source Protection Zone.

4 Flood Risk

4.1 The main risk of flooding to the site comes from the Beldon Brook which is located upon the southern boundary of the site. No flood defences are located within close proximity to the site.

4.2 The Environment Agency confirms that the site falls within Flood Zone 1,2 and 3 with the worst case scenario of a 1 in 100 or greater annual probability of river flooding (>1%).

4.3 Drawing 9069-501 contained within Appendix A shows the flood extents of a 1 in 100 year + climate change and 1 in 1000 year flood event. A small area of the site is located within Flood Zone 3 upon the southern boundary of the site and is deemed as undevelopable land. The drawing highlights areas of the site where building structures can be built.

4.4 There are no constraints to the type of proposal on this allocation assuming that building structures are located wholly within Flood Zone 1.

4.5 The Environment Agency online surface water mapping shows areas of modelled surface water flooding within the boundary of the site, the probability of this occurring is given at between a 1 in 100 and 1 in 1000 annual probability of occurring in any given year and is deemed to have a low risk of occurring. It is assumed that this is a low point within the site.

4.6 Mitigation measures can be implemented within the Full Flood Risk Assessment to ensure surface water localised to, and conveyed within the sites road network would not affect any of the proposed development.

5 Drainage Constraints

5.1 The current building regulations, Part H3, detail the favoured hierarchy of surface water disposal being in order of preference, to ground by infiltration, to watercourse and then to sewer.

1. **Infiltration**
2. **Watercourse**
3. **Sewer**

1. Infiltration Drainage

5.2 Infiltration methods of drainage such as soakaways and filter drains percolate surface water runoff allowing it to permeate into the subsoil at its natural rate mimicking the natural process of drainage and as such are subject to the local ground conditions.

5.3 The Local Authority will request that a site investigation is carried out to deem whether infiltration methods are viable within the site.

2. Discharge to Watercourse

5.4 If the above is not deemed viable the Local Authority will accept discharge to watercourse. The closest main watercourse to the site is the Beldon Brook which is located on the southern boundary of the site.

5.5 The Envrionment Agency and internal drainage board would have be consulted in regards to agreeing an acceptable discharge rate into the Beldon Brook. A rate no greater than 1.4l/s/ha for discharge into local watercourse is normally requested.

3. Discharge to Sewer

5.6 If neither of the above are deemed viable Yorkshire Water should be consulted in order to agree possible surface water outfall. In addition Yorkshire Water will have to be consulted to agree a point of foul connection.

6 Conclusion

6.1 This flood risk overview serves to review and assess the sources of potential flooding to the site

6.2 As concluded in section 3 the site is considered to lie within Flood Zone 1,2 and 3 with the worst case scenario of a 1 in 100 or greater annual probability of river flooding (>1%).

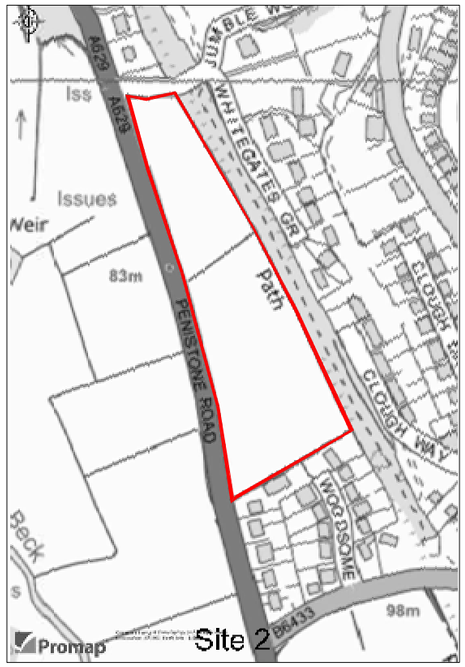
6.3 All buildings should be located wholly within Flood Zone 1.

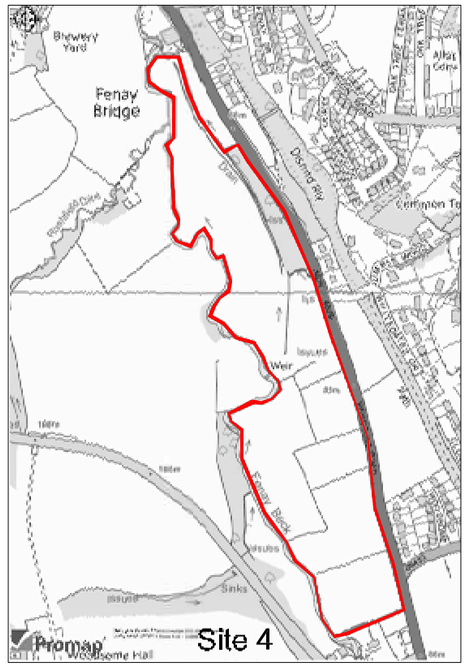
6.4 A full flood risk assessment and surface water management strategy would have to be written and submitted to the Local Authority in order to gain planning permission. This document serves as an overview to inform the client of possible risk and constraints that could arise at the site.

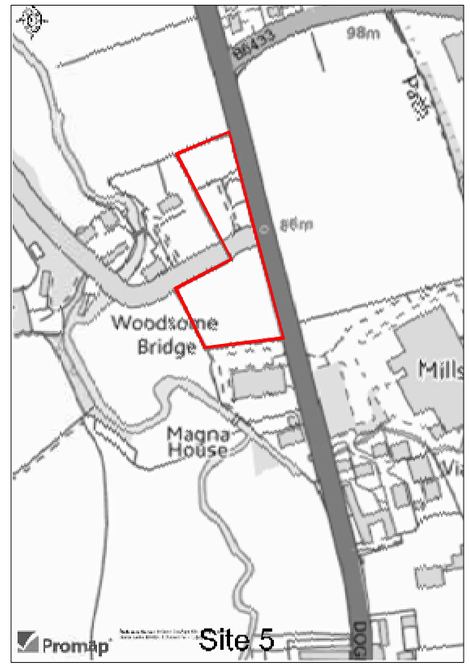
Appendix A - Drawings

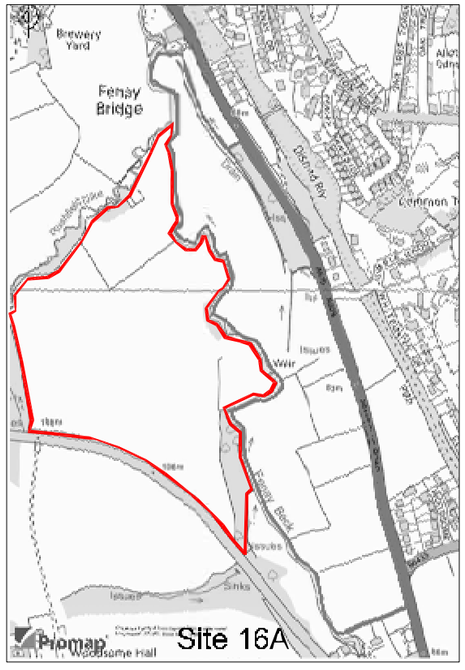
Site Location: 9069/001

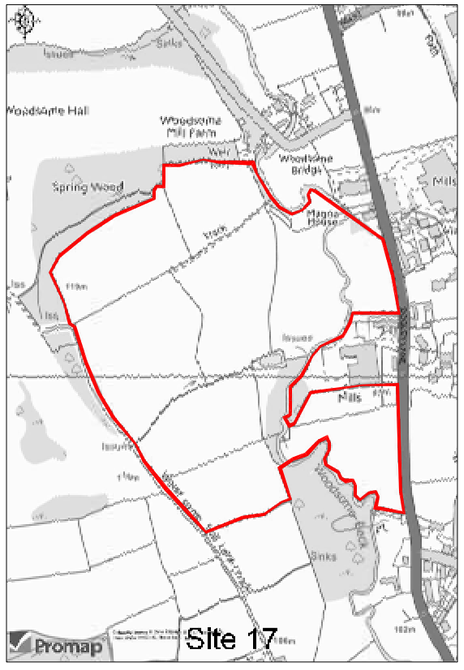
Flood Extent Plan: 9069/501











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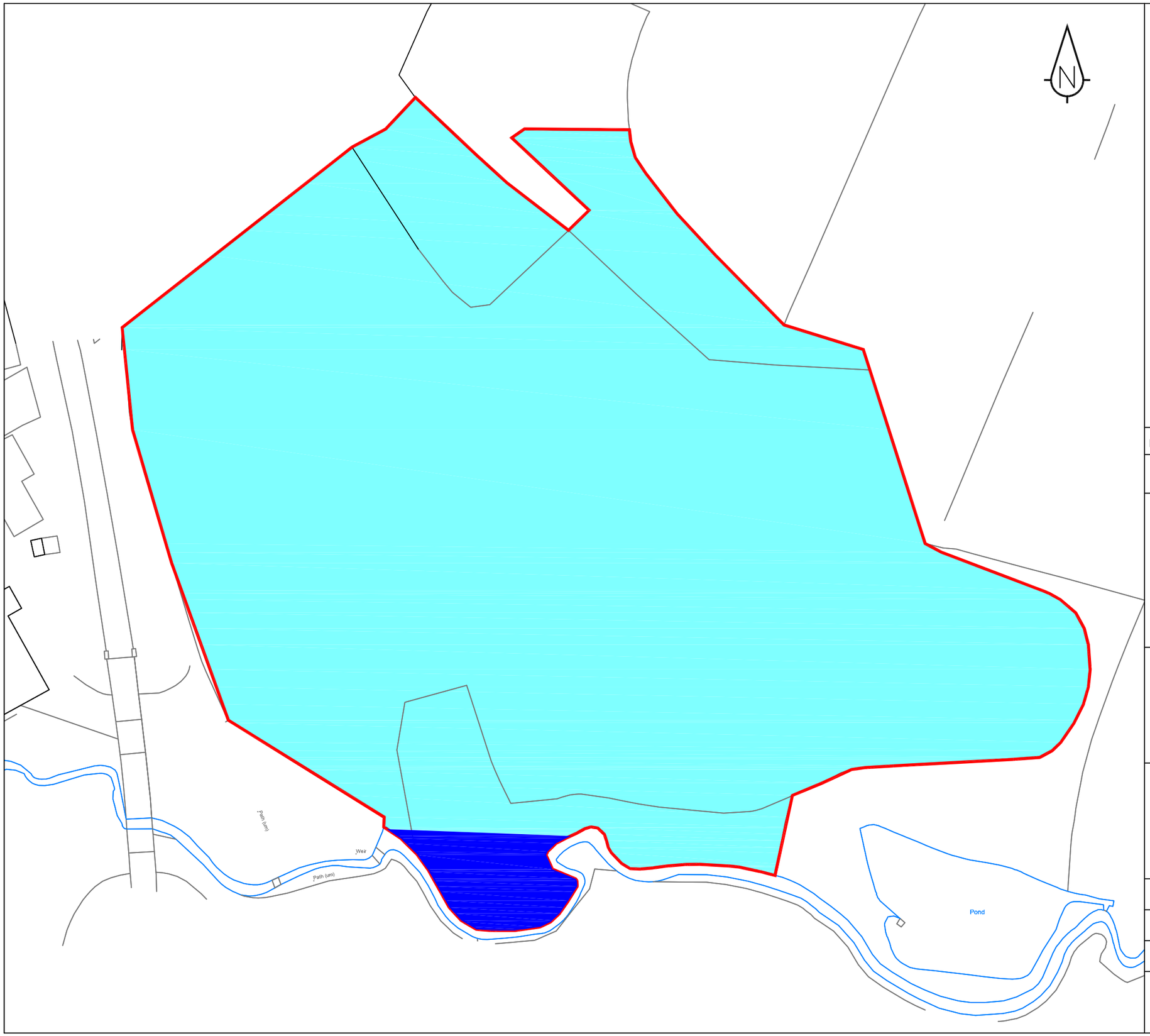
Farnley Masterplan

Site Location Plan

Rev	Amendment	Drawn	Date	Checked

Scale NTS		Drawn By	KB
Drawing Size A3		Checked By	AND
Date Jan. 2016		Approved By	AND
ISO 9001 REGISTERED FIRM	Drawing Number 9069-001		Rev

FILE REF:



- Flood Zone 3
- Flood Zone 1 (Developable Land)

Rev	Amendment	Drawn	Date	Checked

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Project Name

Proposed Development
Farnley Tyas, Huddersfield
Allocation 06

Drawing Title

Flood Extent Plan

Scale	1:1250	Drawn By	DH
Drawing Size	A3	Checked By	IE
Date	Jan 16	Approved By	IE

QMS ISO 9001 REGISTERED FIRM

Drawing Number: 9069-501

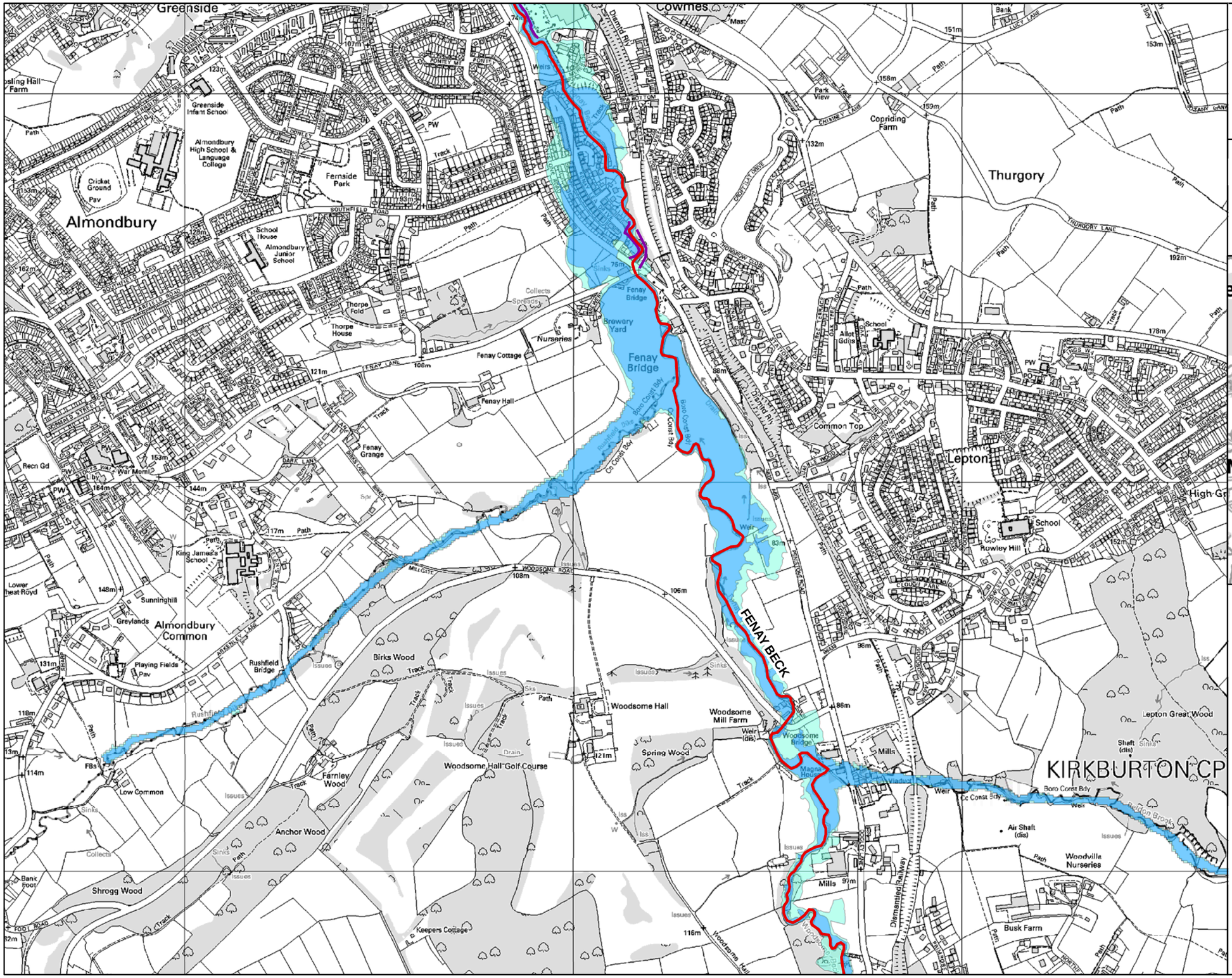
Rev:

FILE REF:

Appendix B - Consultations

Environment Agency

Flood Map Woodsome Road/ Penistone Road, Kirklees - Date Created: 21/06/2013 Ref: 26205



Environment Agency

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Scale: 1:10,000

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LEGEND

- Main River
- Flood Map Flood Defences
- Flood Zone 3 (FZ3)
- Flood Zone 2 (FZ2)

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

APPENDIX C – Calculations

Existing Greenfield Run Off Estimate

IH 124 Mean Annual Flood

Input

Return Period (years)	1	Soil	0.300
Area (ha)	50.000	Urban	0.000
SAAR (mm)	931	Region Number	Region 3

Results	l/s
QBAR Rural	127.2
QBAR Urban	127.2
Q1 year	109.4
Q1 year	109.4
Q2 years	120.0
Q5 years	159.0
Q10 years	184.5
Q20 years	208.9
Q25 years	217.0
Q30 years	223.6
Q50 years	240.9
Q100 years	264.6
Q200 years	300.2
Q250 years	311.7
Q1000 years	386.7

109.4 / 50ha = 2.19l/s

2.19 x 5.07ha = 11.10/s

11.10l/s