RWO Civil Structures Geoenvironmental

Proposed Residential Development

Cleator Mills, Cumbria

Reference	24294/FRADS/1
Client Name	Gleeson Regeneration
Date	May 2025
Version	7

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APPENDICES

CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

Stantec

This report has been prepared for the sole use and reliance of the above-named parties. This report shall not be relied upon or transferred to any other parties without the express written authorisation of RWO Group. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

This report includes an interpretation and assessment of data provided by third parties. Whilst every care has been taken to ensure that this information is accurate and up to date, RWO Ltd cannot guarantee the accuracy of third-party data.

The report findings and conclusions may be subject to change if this data is amended or updated after the consultation has taken place.

DOCUMENT HISTORY

VERSION	PURPOSE/DESCRIPTION	DATE
1	Draft Issue – for client comment	04.11.2020
2	Amended following Environment Agency comments	12.07.2021
3	Amended following addition flood modelling, LLFA & EA comments.	31.08.2022
4	Updated to suit the revised layout and unnamed watercourse flood modelling.	21.06.2023
5	Site developable area amended and risk assessed for new area.	28.11.2023
6	Modelling revised to consider both unnamed watercourse and River Ehen combined.	09.11.2024
7	Amended to suit latest Environment Agency Flood Maps	20.05.2025

1.0 EXECUTIVE SUMMARY

This assessment has looked at the implications of a proposed residential development in relation to flood risk and found all published risks to be low and/or manageable. The proposed developable site is in Flood Zone 1 & 2, placing the risk of flooding for the develop as low - medium.

As the developable area will be within Flood Zone 1 & 2, it meets with national standards for proposed residential dwellings.

To afford the dwellings protection it is proposed to raise the finished floor levels 600mm above the modelled flood level.

Other sources of flooding have been reviewed and deemed low and/or manageable.

Surface water during construction has been considered with interceptor drains included in the temporary state and the attenuation being constructed as the first element of the development site. constructed as the first element of the development site.

2.0 INTRODUCTION

RWO Associates Ltd (RWO) has been instructed by Gleeson Regeneration to prepare a Flood Risk Assessment to support a planning application for a proposed residential development at Cleator in Cumbria.

This assessment is reviewing the available information which includes;

- The Strategic Flood Risk Assessment.
- Environment Agency Flood Maps, published March 2025

This site is covered by a Strategic Flood Risk Assessment (by Jacobs dated 2007 and published on the local authority website Strategic Flood Risk Assessment | Copeland Borough Council) commissioned by Copeland Borough Council. This, more detailed, site-specific Flood Risk Assessment supplements the findings of the Strategic Flood Risk Assessment. It is also covered by the more recent Draft Copeland Borough Council, Level 1 SFRA. For clarity and reference purposes, this report has utilised the latest Draft SFRA dated 2018 to ensure the latest SFRA maps are utilised and considered as part of this FRA.

The site is currently Greenfield, and the client wishes to create residential development; location plans are included in Appendix A.

This report will review the risks associated with the River Ehen, the unnamed watercourse and other published risks. Recommendations as to the developable area and any mitigation requirements will also be made.

3.0 THE SITE

The proposed development site is located to the east of Cleator, about 300m to the south of Cleator Moor and immediately to the west of the Lake District National Park; Figure 1 below shows the site location. A site location plan is included in **Appendix B.**

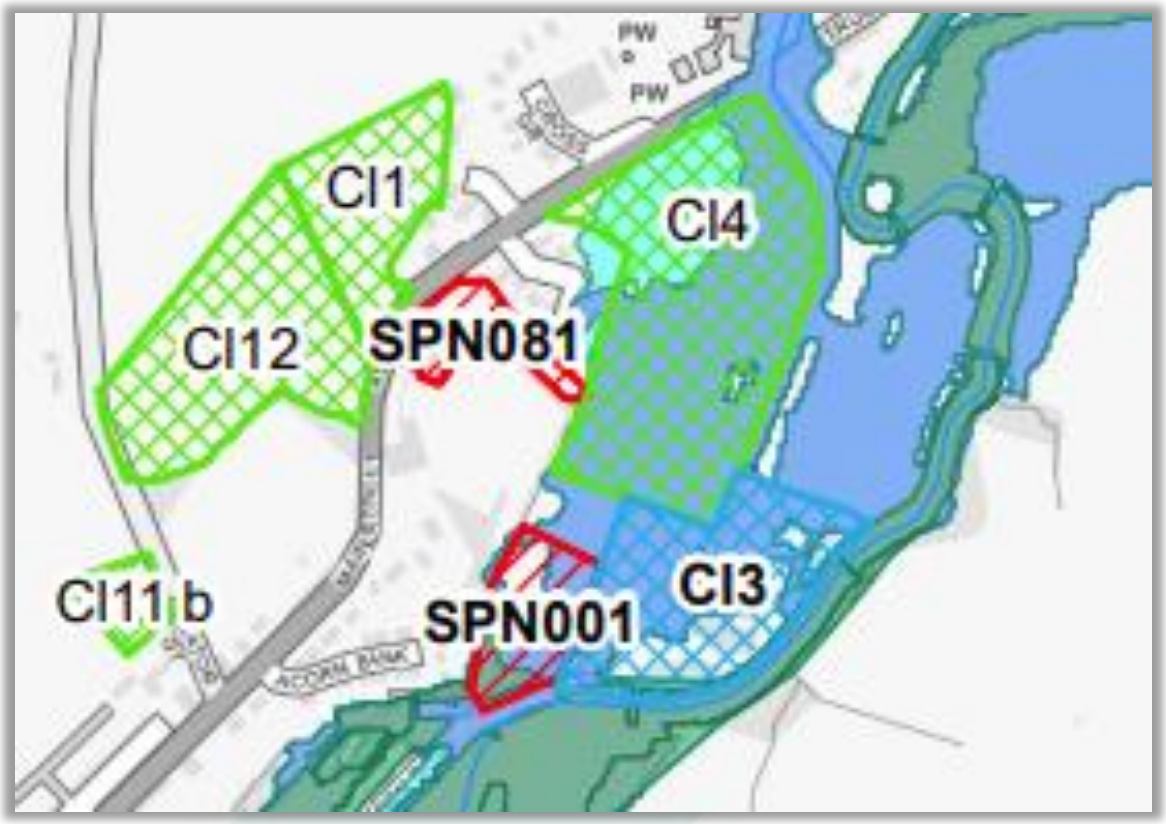
Figure 1 – Site Location (Red line indicates the developable area)

The River Ehen forms the eastern and southern boundary, with residential dwellings located to the west and north. To the immediate south of the proposed development site is the former Kangol factory, with the building varying in age between the early 19th Century and the 1960s. The original building was a linen mill in the 19th Century. The eastern portion of the site historically had a derelict factory located on it, which has since been demolished, and it currently utilised as a Park & Ride. The A5086 is on the north-western boundary of the proposed development site.

A topographic survey of the site is provided in **Appendix B.**

4.0 PROPOSED DEVELOPMENT

It is proposed to consider the site for residential development and consider the number of dwellings that can be safely accommodated without increasing flood risk to others or creating a risk for the proposed development. Based upon the available information the extent of land ownership is located in Flood Zone 1, 2 & 3a, it is noted that the latest Environment Agency flood maps for planning identify the development site has flood defences located to the northeast and east. An extract of the strategic flood map can be seen below in Figure 2 (area identified as C14) with the full map included in **Appendix C.**



As the development site is shown as being located in Flood Zone 1, 2 and 3a with an annual probability of flooding of greater than 1:1000 year, between 1:100 and 1:1000 years and 1:100 years (>1%) , it will therefore be subject to the sequential and exception test in accordance with NPPF Technical Guidance should any development fall within flood zone 3a.

A topographical survey is included in Appendix B.

5.0 PLANNING POLICY AND CONSULTATION

PLANNING POLICY DOCUMENTS

The following planning policy documents were reviewed for this report:

- National Planning Policy Framework and Planning Practice Guidance 6 (2023)
- Flood And Water Management Act (April 2010)
- Defra Sustainable Drainage Systems Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015)
- Sustainable Drainage Systems Written Statement Hcws161 (2014)
- Environment Agency Flooding Maps
- Local Government Flooding Maps

SEQUENTIAL TEST

The proposed development has been sequentially planned such that all development will be limited to Flood Zone 1 & 2.

EXCEPTION TEST

As the proposed development is located in Flood Zone 1 & 2, the exception test is not required.

CONSULTATION

The following organisations data has been utilised to assess flood risk;

- Environment Agency (EA)
- Cumbria County Council (LLFA)
- United Utilities (UU)

Consultation responses have been received from all of the above organisations where appropriate.

COMPLIANCE

The scope of the Flood Risk Assessment has been developed based on all relevant policy information, along with requirements outlined in the consultation responses, with the latest response requesting the flood risk be reviewed following the latest flood maps be published.

It is therefore anticipated that this report fulfils the required criteria and is compliant with all relevant flood risk planning policy, subject to any further information being provided by the consultees.

6.0 FLOOD RISK

The site under consideration is located within Flood Zone 1,2 & 3a on the latest version of the Indicative Floodplain Maps available on the Gov.uk website, a copy of the flood map is provided in **Appendix D**. The updated flood maps from the Environment Agency include the River Ehen and the unnamed watercourse to the North West. It should be noted it is only proposed to undertake development in Flood Zones 1 & 2, with all development being located outside of Flood Zone 3.

To assist with the clarity on the flood zones, the opensource flood maps have been downloaded and overlaid onto the OS Maps, a drawing is included in **Appendix E**. The areas located in flood Zones 1 & 2 will be developed with suitable raising of levels providing a 600mm freeboard over flood levels.

The site benefits from formal flood defences to the North East against flooding from the River Ehen, this affords the proposed developable area protection and along with raising of Finished Floor levels will ensure the development remains protected for all event sup to and including the 1 in 1000-year return period. A plan showing the extent of formal flood defences is included in **Appendix F**. A copy of the flood defence survey is included in **Appendix G**.

The proposed site usage falls within the 'more vulnerable' category as identified in the NPPF Table 2: Flood Risk Vulnerably Classification. As such the exception test, will not need considering based on the NPPF Table 3: Flood risk vulnerability and flood zone 'compatibility'.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Table 1 – 'NPPF Table 3: Flood Risk Vulnerability Classification'

Essential infrastructure • **Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.** • **Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.** • **Wind Turbines.**
Highly Vulnerable • **Police stations, ambulance stations and fire stations and command centres and telecommunication installations required to be operational during flooding.** • **Emergency disposal points.** • **Basement dwellings.** • **Caravans, mobile homes and park homes intended for permanent residential use.** • **Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as "essential infrastructure").**
More vulnerable • **Hospitals.** • **Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.** • **Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.** • **Non-residential uses for health services, nurseries and educational establishments.** • **Landfill and sites used for waste management facilities for hazardous waste.** • **Sites used for holiday or short-let caravans and camping, *subject to a specific warning and evacuation plan.***
Less vulnerable • **Police, ambulance and fire stations which are not required to be operational during flooding.** • **Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in "more vulnerable", and assembly and leisure.** • **Land and buildings used for agricultural and forestry.** • **Waste treatment (except landfill and hazardous waste facilities).** • **Minerals workings and processing (except for sand and gravel working).** • **Water treatment works which do not need to remain operational during times of flood.** • **Sewerage treatment works (if adequate measures to control pollution and manage sewerage during flooding events are in place).**
Water-compatible development • **Flood control infrastructure.** • **Water transmission infrastructure and pumping stations.**

- **Sewage transmission infrastructure and pumping stations.**
- **Sand and gravel working.**
- **Docks, marinas and wharves.**
- **Navigation facilities.**
- **Ministry of defence installations.**
- **Ship building, repairing, dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.**
- **Water based recreation (excluding sleeping accommodation).**
- **Lifeguard and coastal stations.**
- **Amenity open space, nature conversation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.**
- **Essential ancillary sleeping or residential accommodation for staff required by uses in this category, *subject to specific warning and evacuation plan.***

Table 2 – 'NPPF Table 2: Flood Risk Vulnerability Classification'

RWO have assessed the risk of flooding to the site from all known current and future potential.

The table below summarises the findings of the assessment. A more detailed explanation of the flood issues on the site and determination of flood risk ratings are presented in the below sections.

Flood Risk	
Risk of flooding from rivers and the sea	Low - Medium
Flood storage areas: part of floodplain	Not identified
Historical flood areas	Not identified
Areas benefiting from flood defences	Site
Flood defences	Existing
Proposed flood defences	Raising of levels to afford protection.
Surface water flood risk	Low
Groundwater flooding	Low
Sewer	As per GIS Plans

Modelled Flood Levels and Flood Depths

These have been requested and will be utilised to set the minimum finished floor levels across the developable area within existing flood zones 1 & 2.

Flood Warning Area

The site is not within or adjacent to a Flood Warning Area.

Tidal/Coastal Flood Risk

The site is not considered to be at risk from tidal flooding and sea level rise due to climate change is not expected to influence the site.

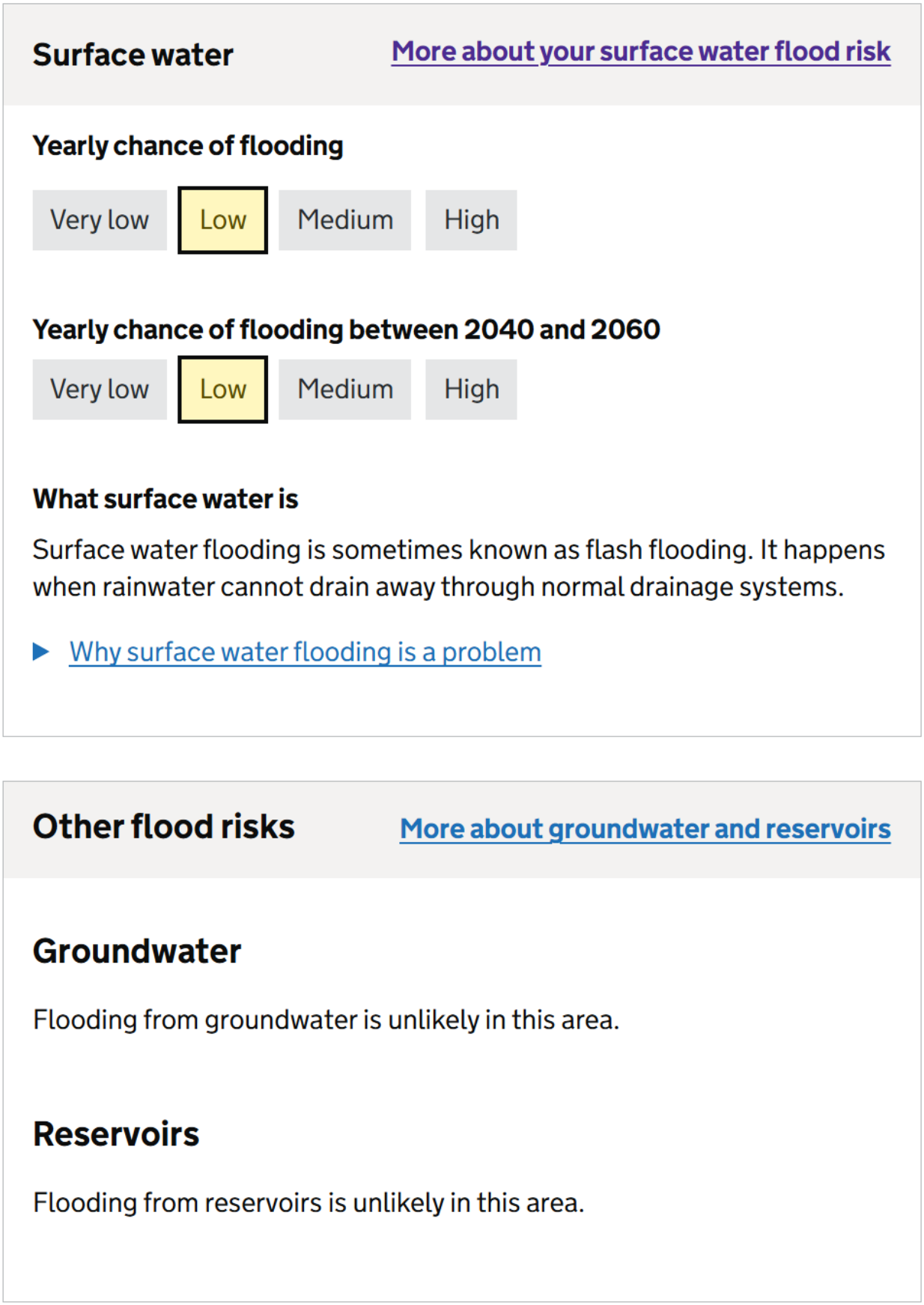
Groundwater Flooding

The EA information indicates that site is located within an area not considered to be at risk from groundwater flooding.

Reservoir Flooding

Reference to the Environment Agency information confirms that the site is outside of the zone of influence from any reservoir flooding.

Based on the available information, it is assessed that the site is at low risk of reservoir flooding.



Surface water

More about your surface water flood risk

Yearly chance of flooding

Very low | **Low** | Medium | High

Yearly chance of flooding between 2040 and 2060

Very low | **Low** | Medium | High

What surface water is

Surface water flooding is sometimes known as flash flooding. It happens when rainwater cannot drain away through normal drainage systems.

▶ Why surface water flooding is a problem

Other flood risks

More about groundwater and reservoirs

Groundwater

Flooding from groundwater is unlikely in this area.

Reservoirs

Flooding from reservoirs is unlikely in this area.

Figure 2 – EA Extract

Surface Water Flooding

The online Environment Agency surface water flood risk maps have been reviewed, and no areas within Flood Zone 1 7 2 are impacted by surface water flooding.

In summary the proposed development site is assessed to be at low risk from surface water flooding.

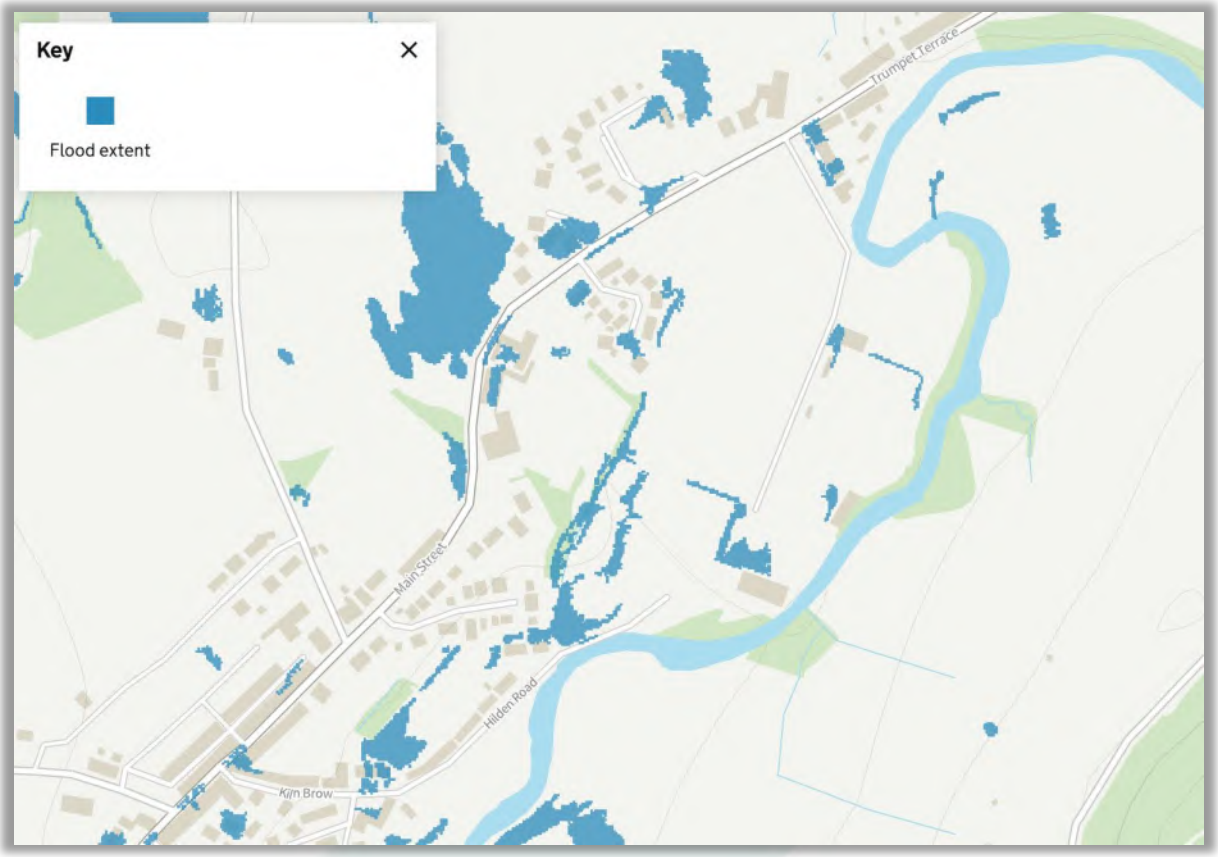


Figure 3 – EA Surface Water Extract

7.0 MANAGEMENT OF FLOOD RISK

Compensatory Flood Storage

The proposed development site is located in Flood Zone 1 & 2. Therefore, compensatory flood storage is not required.

Finished Floor Levels

Finished floor levels will be set a minimum of 600 mm the modelled flood levels to ensure adequate defence in the event of a flooding incident. External levels to be raised a minim of 300mm above modelled flood levels.

Flood Resilience /Resistance

As it is proposed to raise finished floor levels to 600mm above the modelled flood levels, it is not deemed necessary to incorporate flood resilience measures.

Access and Egress

The extent of the flooding would not be considered to be sufficient enough to hinder emergency access/egress to the development site, in addition alternative access routes are available.

Design of External Surfaces and Infrastructure

The risk of surface water flooding to the site can be managed through the following.

- Engineering site levels to provide positive drainage away from buildings and other receptors, and towards the site drainage; and
- Construction of a suitably designed drainage system with adequate capacity and storage volume to manage surface water for events up to the 1 in 100-year design storm, including allowance for climate change.

8.0 CONSTRUCTION AND SURFACE WATER MANAGEMENT

To manage surface water during construction two processes are proposed.

- Interceptor drains with sumps constructed within each phase/parcel of development,

Interceptor drains will collect and capture overland flows once site topsoil strip has been undertaken and allow the flows to be conveyed to the existing drainage network. The interceptor drains will ensure that the overland flows are managed. Sumps will be formed at low points on the interceptor drains, and this will allow debris and potential pollutants to be captured.

An indicative surface water construction management drawing will be produced prior to construction.

9.0 CONCLUSIONS

This assessment has looked at the implications of a proposed residential development in relation to flood risk and found all published risks to be low and/or manageable. The proposed developable site is in Flood Zone 1 & 2, placing the risk of flooding for the develop as low - medium.

As the developable area will be within Flood Zone 1 & 2, it meets with national standards for proposed residential dwellings.

To afford the dwellings protection it is proposed to raise the finished floor levels 600mm above the modelled flood level.

Other sources of flooding have been reviewed and deemed low and/or manageable.

Surface water during construction has been considered with interceptor drains included in the temporary state and the attenuation being constructed as the first element of the development site.

RWO
May 2025

APPENDIX A: SITE LOCATION PLAN

Location Map	
Site	**Cleator Mill - Residential**
Client	Gleeson Regeneration
Job Number	19002
Scale	NTS

APPENDIX B: TOPOGRAPHICAL SURVEY

Edmondson Surveys Ltd
Suite 8, Cumbria House, Gilwilly Road
Penrith, Cumbria. CA11 9FF
Telephone Number: 01768 861814
www.edmondsonsurveys.co.uk
e-mail: survey@edmondsonsurveys.co.uk

File	E2532\Kang500	Client	Site Scan Ltd
Note	All levels and the plan grid are in metres and are both relative to the Ordnance Survey.	Project	Former Kangol Factory Site Cleator, West Cumbria
		Description	Topographic Survey
		Surveyed	04–08/11/2010
		Drawing Number	E2532/01/A
		Plotted	09–10/11/2010
		Scale	1:500

KEY

LINETYPES

- VERGE
- FENCE - CHAIN LINK
- FENCE - METAL
- FENCE - WOODEN
- FENCE - POST & RAIL
- HEDGE
- WALL
- BARRIER
- CHANNEL LINE
- CONCRETE EDGE
- FOOTPATH
- TRACK
- BUILDING
- TREE
- GATE
- SURVEY STATION
- EAVES

UTILITY KEY

LINETYPES

- BT BELOW GROUND
- BT ABOVE GROUND
- BT ASSUMED ROUTE
- CATV BELOW GROUND
- CATV ABOVE GROUND
- CATV ASSUMED ROUTE
- COMMS BELOW GROUND
- COMMS ABOVE GROUND
- COMMS ASSUMED ROUTE
- GAS BELOW GROUND
- GAS ABOVE GROUND
- GAS ASSUMED ROUTE
- ELECTRIC BELOW GROUND
- ELECTRIC ABOVE GROUND
- ELECTRIC ASSUMED ROUTE
- WATER BELOW GROUND
- WATER ABOVE GROUND
- WATER ASSUMED ROUTE
- UNKNOWN BELOW GROUND
- UNKNOWN ABOVE GROUND
- CPR BELOW GROUND
- COMBINED WATER SEWER
- ASSUMED COMBINED WATER SEWER ROUTE
- FOUL WATER SEWER
- ASSUMED FOUL WATER SEWER ROUTE
- STORM WATER SEWER
- ASSUMED STORM WATER SEWER ROUTE
- REINSTATEMENT SCAR
- SURVEY BOUNDARY

ABBREVIATIONS

(AC)	ASSUMED CONNECTION	INT	INTERCEPTOR
AG	ABOVE GROUND	KV	KILO VOLT
(AR)	ASSUMED ROUTE	LD	LOOP DETECTOR
ASB	ASBESTOS CEMENT	LH	LAMP HOLE
AV	AIR VALVE	LP	LAMP POST
BB	BELISHA BEACON	LV	LOW VOLTAGE
BD	BACK DROP	MK	MARKER
BL	BASE LEVEL	MH	MANHOLE
BO	BOLLARD	MT	METER
BOL	BOLLARD LIGHT	MWELL	MONITORING WELL
BT	BRITISH TELECOM	OH	OVERHEAD
CATV	CABLE TELEVISION	PE	POLYETHYLENE
CB	CONTROL BOX	PTG	PIPE TO GROUND
CI	CAST IRON	PVC	POLYVINYL CHLORIDE
CL	COVER LEVEL	TPR	TAKEN FROM RECORDS
CR	CABLE RISER	RE	RODDING EYE
CWS	COMBINED WATER SEWER	RED	REDUNDANT SERVICE
d	DEPTH OF SERVICE	RWP	RAIN WATER PIPE
DCH	DRAINAGE CHANNEL	SC	STOP COCK
DI	DUCTILE IRON	SI	SPUN IRON
DIS	DISUSED	SOP	SOFFIT
EOT	END OF TRACE	SP	SOIL PIPE
EP	ELECTRIC POLE	SWS	SURFACE WATER SEWER
ER	EARTH ROD	SV	STOP VALVE
FFP	FUEL TANK FILL POINT	TL	TRAFFIC LIGHT
FH	FIRE HYDRANT	TLC	TRAFFIC LIGHT COVER
FWS	FOUL WATER SEWER	TP	TELECOM POLE
GPR	GROUND PENETRATING RADAR	UTL	UNABLE TO LIFT
GR	GAS RISER	UTS	UNABLE TO SURVEY
GV	GAS VALVE	UTT	UNABLE TO TRACE
GY	GULLY	VC	VITRIFIED CLAY
HV	HIGH VOLTAGE	VP	VENT PIPE
IC	INSPECTION COVER	WL	WATER LEVEL
id	INVERT DEPTH	WO	WASH OUT
IL	INVERT LEVEL	WR	WATER RISER

DISCLAIMER

Unless otherwise stated, all services shown on this plan have been surveyed using approved detectors and the connections between manholes, if not traced, are assumed to be direct.

No guarantee can be given that all services have been shown.
Is ideal confirms the depth accuracies for the underground utilities located is +/- 10% of depth.

Utilities traced using GPR techniques show depths approximately from ground level to the top of the utility. Utilities traced using Electromagnetic techniques provide an estimated depth which is measured from ground level to the centre of the utility. Drainage and pipes traced using Sonde Electromagnetic techniques show depths at approximately the Invert Level.

Where services are shown as 'Taken From Records' on the drawing we are not liable for any loss that may arise due to a lack of accuracy in that quoted information.

Due to BT's policy we are not permitted to lift their inspection chamber covers.

Reference should be made to the methodology used on site as detailed within the latest version of SiteScan Procedures for Utility Location Surveys.

SiteScan recommend that all excavations are to be carried out in accordance with HSG 47 (Avoiding Danger from Underground Services).

Plan accuracies of the order of + or - 150mm may be achieved but this figure will depend on the depth of the service below ground level. Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited.

Existing record information showing underground services is often incomplete and of doubtful accuracy. It should be regarded only as an indication and cannot be guaranteed.

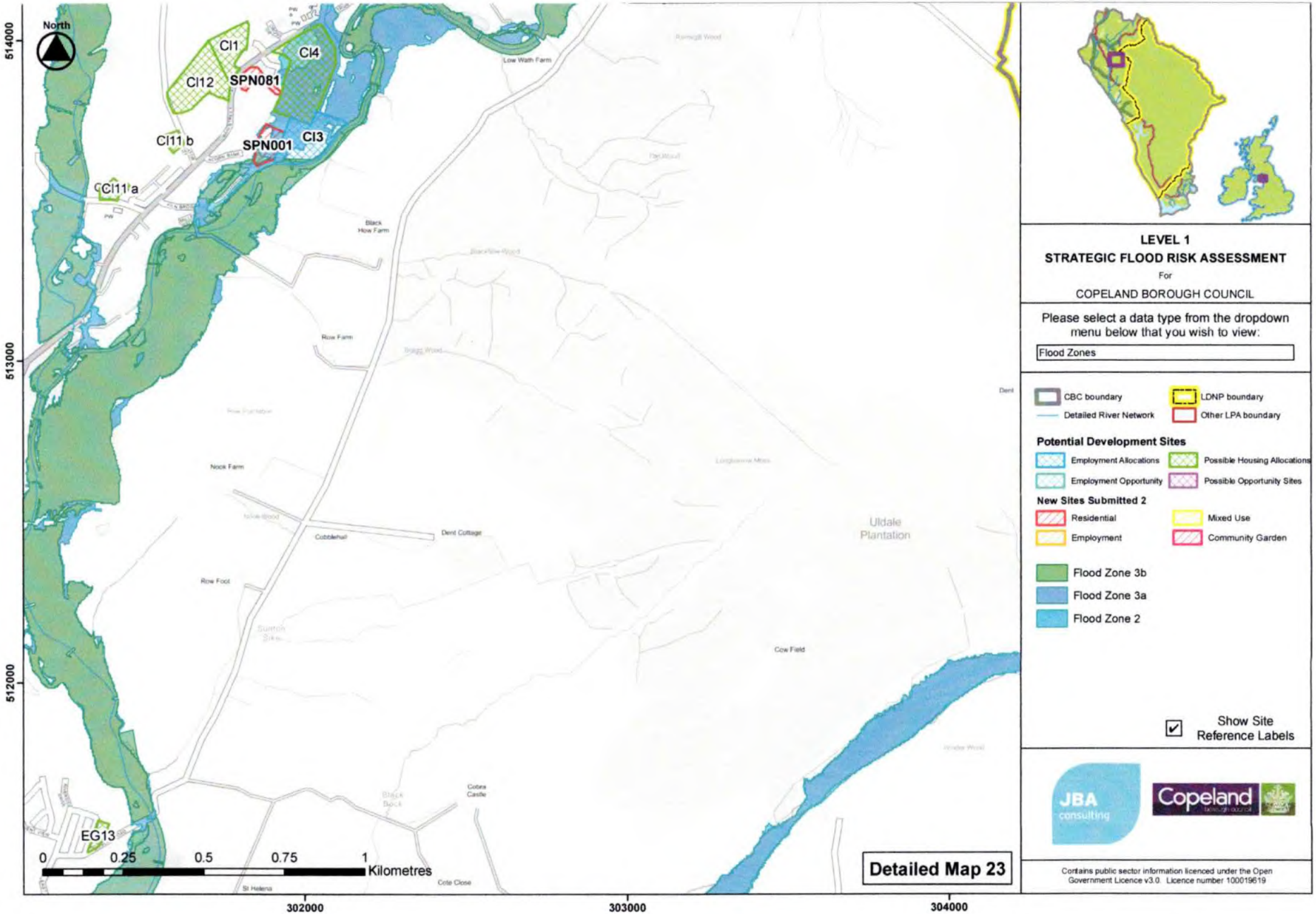
NOTES

REV	AMENDMENT	DRAWN	CHECKED

SITESCAN
Vita House, Fish Quay, North Shields, Tyne & Wear, NE30 1JA
www.sitescanltd.com info@sitescanltd.com
Tel: 0191 2572911

CLIENT	RWO
PROJECT TITLE	KANGOL FACTORY CLEATER
DRAWING TITLE	DRAINAGE SURVEY
SCALE AT A1	NTS
DATE	JUN 2013
ORIGINATOR	
SURVEYED BY	JRD
DRAWN BY	JRD
APPROVED	NC
PROJECT No.	CLE/RWO/DRAIN
SHEET No.	1 of 1
REV	A

APPENDIX C: STRATEGIC FLOOD MAP



LEVEL 1
STRATEGIC FLOOD RISK ASSESSMENT
For
COPELAND BOROUGH COUNCIL

Please select a data type from the dropdown menu below that you wish to view:

Flood Zones

CBC boundary
LDNP boundary
Detailed River Network
Other LPA boundary

Potential Development Sites

Employment Allocations
Possible Housing Allocations
Employment Opportunity
Possible Opportunity Sites

New Sites Submitted 2

Residential
Mixed Use
Employment
Community Garden

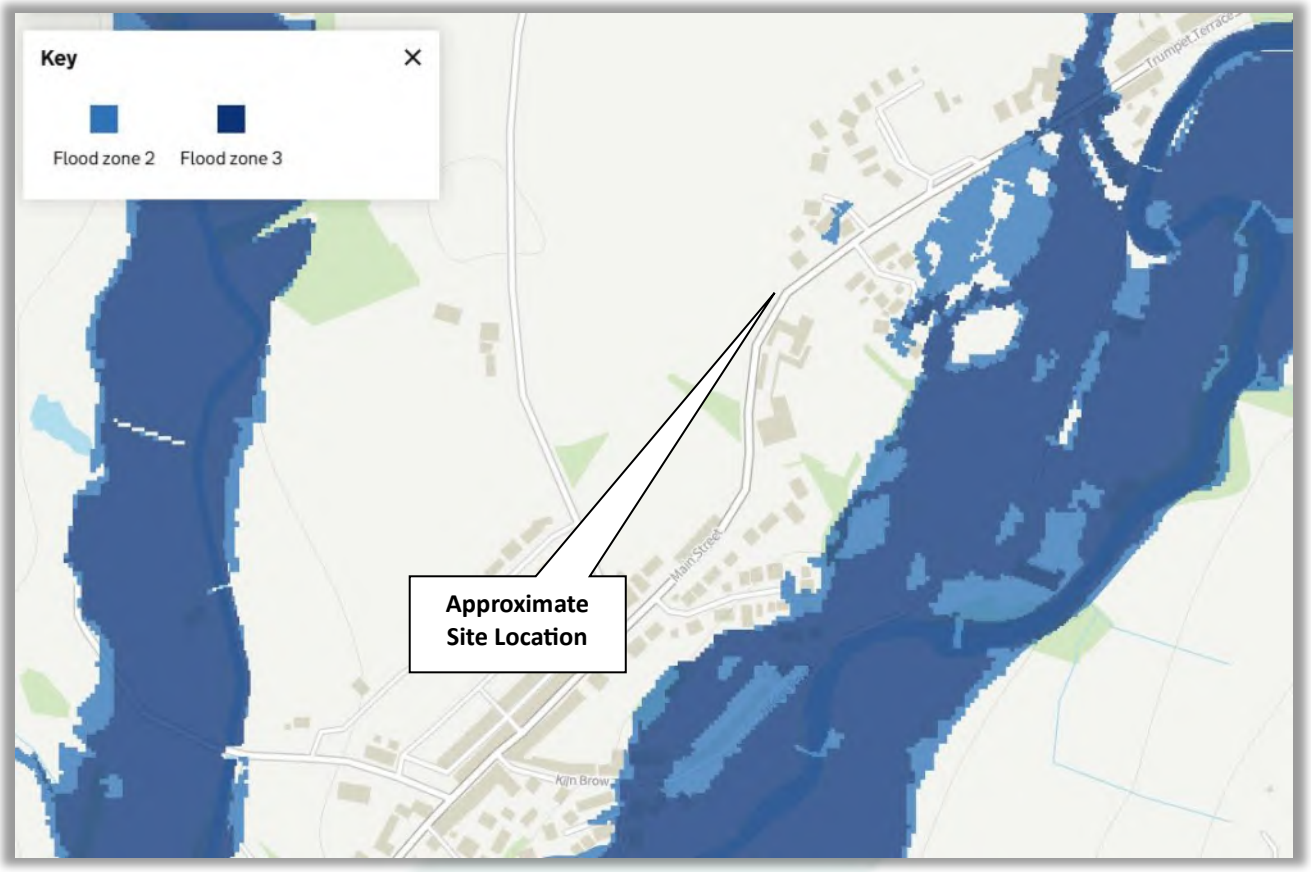
Flood Zone 3b
Flood Zone 3a
Flood Zone 2

☑ Show Site Reference Labels

JBA consulting

Copeland borough council

APPENDIX D: EA FLOOD MAP RIVERS & SEA



Environment Agency Flood Map	
Site	**Cleator Mill – Residential**
Client	Gleeson Regeneration
Job Number	19002
Scale	NTS

APPENDIX E: FLOOD ZONE OVERLAY

DESIGN RISK NOTES:

1. IN ACCORDANCE WITH THE CONSTRUCTION (DESIGN & MANAGEMENT) REGULATIONS 2015, IT IS THE POLICY OF THIS PRACTICE TO 'DESIGN OUT' AS MANY IDENTIFIABLE RISKS AS POSSIBLE FOR THE CONSTRUCTION, OPERATION AND MAINTENANCE OF THE PROJECT.
2. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE PRE CONSTRUCTION INFORMATION WHICH IS DEFINED IN THE CONSTRUCTION (DESIGN & MANAGEMENT) REGULATIONS 2015.
3. A COMPETENT CONTRACTOR SHOULD BE AWARE OF 'NORMAL' RISKS INVOLVED WITH THE CONSTRUCTION PROCESS. HOWEVER ADDITIONAL PRECAUTIONS WILL NEED TO BE CONSIDERED FOR THE FOLLOWING ITEMS:
   A) NONE IDENTIFIED.
4. SAFE METHODS AND SYSTEMS OF WORK REMAIN THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE IDENTIFIED IN THE CONSTRUCTION PHASE PLAN. THE CONSTRUCTION PHASE PLAN MUST BE IN PLACE PRIOR TO THE START OF ANY MOBILIZATION OR SITE WORKS.
5. RESIDUAL RISKS THAT HAVE BEEN IDENTIFIED AND CANNOT BE 'DESIGNED OUT' ARE AS FOLLOWS:
   A) NONE IDENTIFIED.
6. IF ANY PARTY USING THIS DRAWING CONSIDERS THAT THERE ARE 'ABNORMAL' RISKS THAT HAVE NOT BEEN IDENTIFIED ABOVE, THEN THE ENGINEER SHOULD BE NOTIFIED.

ADDITIONAL HEALTH & SAFETY NOTES:

1. CONTRACTOR SHOULD BE AWARE OF GENERAL CONSTRUCTION RISKS TO PREVENT SLIPS, TRIPS AND FALLS AND TAKE NECESSARY PRECAUTIONS WITHOUT SPECIAL INSTRUCTION.

ROADS & DRAINAGE

2. CONTRACTOR TO PROVIDE TRENCH SUPPORTS AS APPROPRIATE AND ENSURE THAT PLANT REMAINS A SAFE DISTANCE FROM TRENCHES PRIOR TO INSTALLING DRAINAGE.
3. THE TIME THAT EXCAVATIONS ARE OPEN ON SITE SHOULD BE KEPT TO A MINIMUM AND ALL TRENCHES SHOULD BE SURROUNDED BY A BARRIER.
4. CONNECTIONS TO EXISTING SEWERS TO BE MADE BY APPROVED CONTRACTOR ONLY.
5. CONTRACTOR TO MAKE OPERATIVES AWARE OF ASSOCIATED DANGERS TO HEALTH SUCH AS LEPTOSPIROSIS (WEILS DISEASE) AND RECOMMENDED PRECAUTIONS. ADEQUATE WELFARE FACILITIES AND PROTECTIVE CLOTHING TO BE PROVIDED AS REQUIRED.
6. UNFINISHED MANHOLES MUST BE COVERED WITH LOAD BEARING MATERIALS AND SURROUNDED WITH BARRIER.

PIPES & CABLES

7. CONTRACTOR TO OBTAIN ALL SERVICE RECORDS PRIOR TO WORKS COMMENCING.
8. SERVICE RECORDS TO BE REFERRED TO PRIOR TO WORK COMMENCING. CONTRACTOR TO PROCEED WITH CAUTION AND SERVICES TO BE LOCATED BY HAND DIG AND PROTECTED ACCORDINGLY.

EXCAVATION/FILL

9. CONTRACTOR TO ENSURE RELEVANT MEASURES ARE TAKEN TO KEEP PLANT AND PEOPLE A SAFE DISTANCE FROM STEEP SLOPES DURING THE WORKS.
10. CONTRACTOR TO ENSURE THAT PROCEDURES ARE IN PLACE TO KEEP PEOPLE A SAFE DISTANCE FROM WORKING PLANT WHERE NECESSARY.
11. CONTRACTOR TO REFER TO GROUND INVESTIGATION REPORT FOR CONTAMINATION TESTS AND TO PROVIDE ADEQUATE WELFARE FACILITIES AND PROTECTIVE CLOTHING AS REQUIRED.
12.

KEY

SITE BOUNDARY

Key

Flood zone 2

Flood zone 3

Date	Revisions	Drawn	Checked	Rev
20/05/2025	LAYOUT OMITTED & BOUNDARY UPDATED TO RED AS REQUESTED	RM	RWO	2
16/05/2025	FIRST ISSUE	RM	AE	1

Dwg Status: SKETCH

NORTH EAST
0191 2585632

YORKSHIRE
0113 535 3500

RWO
CONSULTING ENGINEERS
WWW.RWO.GROUP
INFO@RWO.GROUP

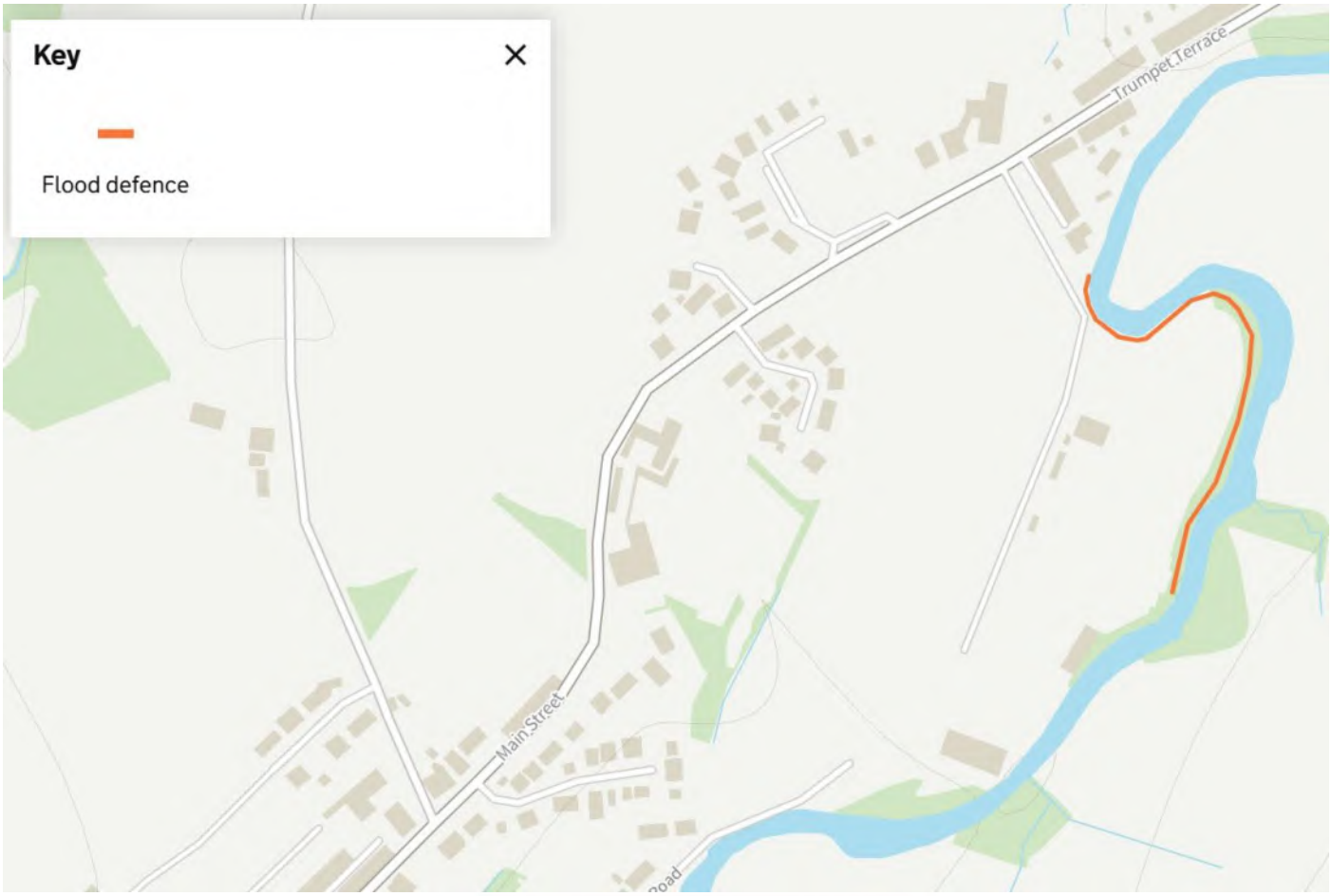
Client: GLEESON HOMES

Project: CLEATOR MILLS

Title: FLOOD ZONES

DO NOT SCALE	Scale @ A0: 1:500	Drawn RM	Checked AE	Date 16/05/2025
Job No 19002		Dwg No SK004		Rev 2

APPENDIX F: FORMAL FLOOD DEFENCES PLAN



Environment Agency Flood Defence Map	
Site	**Cleator Mill – Residential**
Client	Gleeson Regeneration
Job Number	19002
Scale	NTS

APPENDIX G: FLOOD DEFENCE SURVEY

Cleator Flood Asset Condition Assessment

23 MAR 2022
Version 1.0
RAB: 2869

Disclaimer

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Revision History

Version	Date	Amendments	Issued to
1.0	23/03/2022		Ross Oakley

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Contents

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1.0 Introduction

Cleator, Cumbria is in the Borough of Copeland in the Northwest of England. The River Ehen is within the catchment of Copeland's Wild Rivers and runs from Ennerdale Water to Sellafield where it enters the Irish Sea. The watercourse passes through Cleator, where there are numerous flood defences and structures around the watercourse including embankments, outfalls, walls, natural high ground and engineered high ground.

Approximately 1km of the River Ehen flood assets were inspected to assess their condition, defects and required maintenance. This report contains details of the findings of these inspections including estimated costs for the preservation of the assets.

2.0 Method

The condition grading and descriptions given below are the standards adopted by the Environment Agency. The five condition grades range from 'very good' to 'very poor', and the descriptions reflect condition according to flood defence performance.

Grade	Rating	Description
1	Very Good	Cosmetic defects that will have no effect on performance
2	Good	Minor defects that **will not** reduce the overall performance of the asset
3	Fair	Defects that **could** reduce performance of the asset
4	Poor	Defects that **would** significantly reduce the performance of the asset. Further investigation needed
5	Very Poor	Severe defects resulting in complete performance failure

The inspection was carried out and recorded in accordance with the Condition Assessment Manual (March 2012) and Version 4 of the Asset Template and Weighting Guidance on 28 January 2022 by Environment Agency accredited Flood Asset Inspectors.

Visual inspection is the simplest form of non-destructive testing, as it does not require any specialist equipment. It is a widely used technique for monitoring assets and their surroundings. However, as only the surface of a structure is visible, this method can only assess the surface details and condition of an asset; changes to interior structure and condition are not easily identifiable until they lead to changes to the surface of the asset. Assessment of an asset's surroundings remains a key indicator to the asset's performance and integrity.

The recommendations arising from the visual inspection include remedial works to address visible defects and bring each element of the asset back to at least "fair" condition, but also actions to overcome access constraints and/or the need for other tests or investigations to assess an assets performance and integrity.

3.0 Flood Assets and Condition Assessment

Figure 1 and Table 1 provide a summary of the location, type and condition grade of flood assets identified and inspected on 28 January 2022.

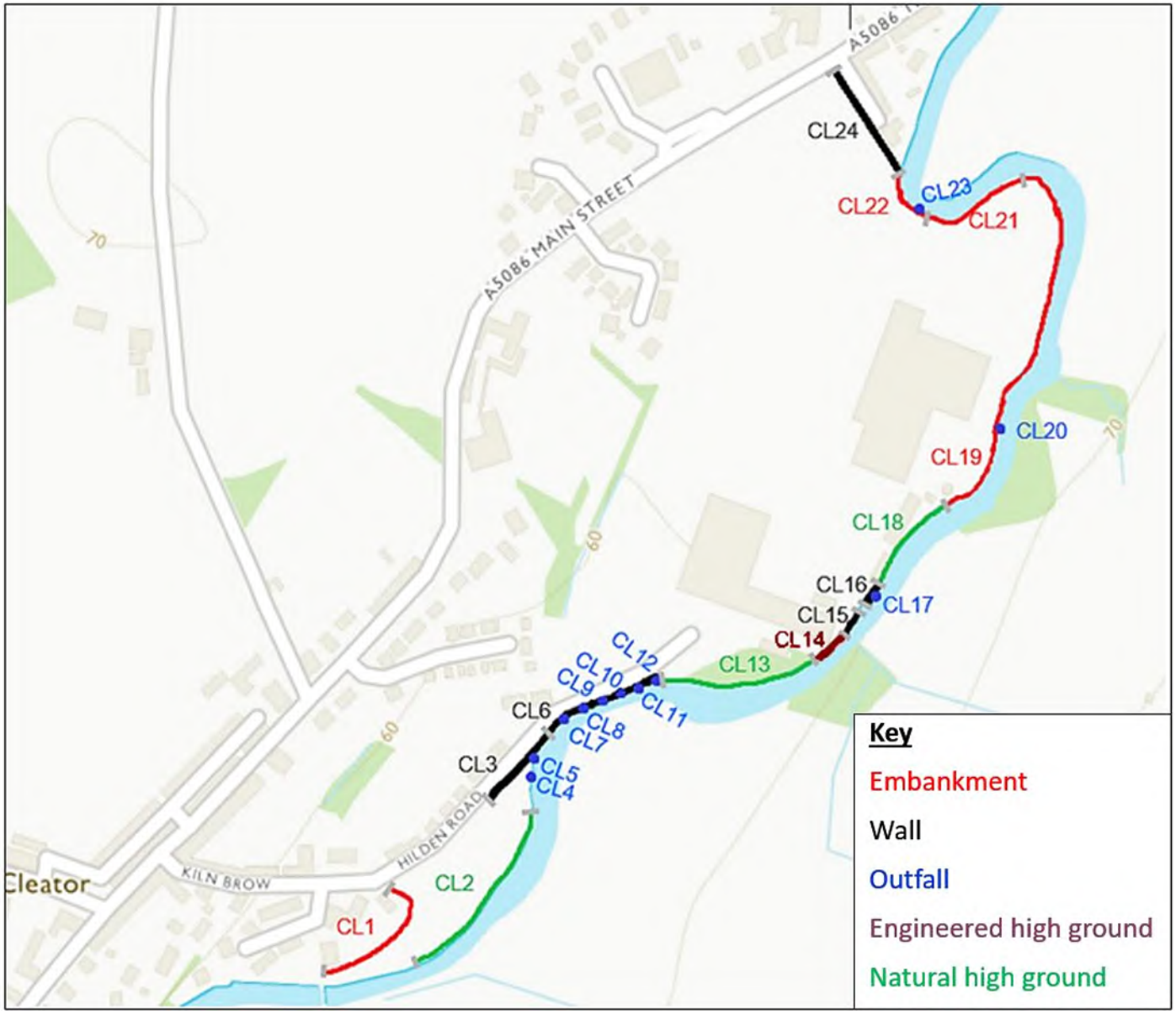


TABLE 1: FLOOD ASSET CONDITION SUMMARY.

Asset ID	Asset type/sub-type	Description	Grade
CL1	Defence - Embankment	Embankment running in front of houses below Hilden Road and Kiln Brow	4
CL2	Defence – Natural High Ground	Natural high ground located below Hilden Road before wall	3
CL3	Defence – Wall	Stone wall on Hilden Road with berm	4
CL4	Structure – Outfall	Outfall located on River Ehen	3
CL5	Structure – Outfall	Outfall located on River Ehen	3
CL6	Defence – Wall	Stone wall on Hilden Road	4
CL7	Structure – Outfall	One of six identical outfalls located within wall on Hilden Road	2
C8	Structure – Outfall	One of six identical outfalls located within wall on Hilden Road	2
CL9	Structure – Outfall	One of six identical outfalls located within wall on Hilden Road	2
CL10	Structure – Outfall	One of six identical outfalls located within wall on Hilden Road	2
CL11	Structure – Outfall	One of six identical outfalls located within wall on Hilden Road	2
CL12	Structure – Outfall	One of six identical outfalls located within wall on Hilden Road	2
CL13	Defence – Natural High Ground	Natural high ground located below Mill Street	3
CL14	Defence – Engineered High Ground	Engineered high ground in front of old mill	3
CL15	Defence – Wall	Stone wall in front of old mill	3
CL16	Defence – Wall	Brick wall with brick channel side located on River Ehen	3
CL17	Defence – Natural High Ground	Natural high ground located on River Ehen	3
CL18	Defence – Embankment	Earth embankment located on River Ehen	3
CL19	Structure – Outfall	Drainage pipe located on River Ehen	3
CL20	Structure – Outfall	Outfall located on River Ehen	3
CL21	Defence - Embankment	Earth embankment with gabions and sheet piling on River Ehen	3

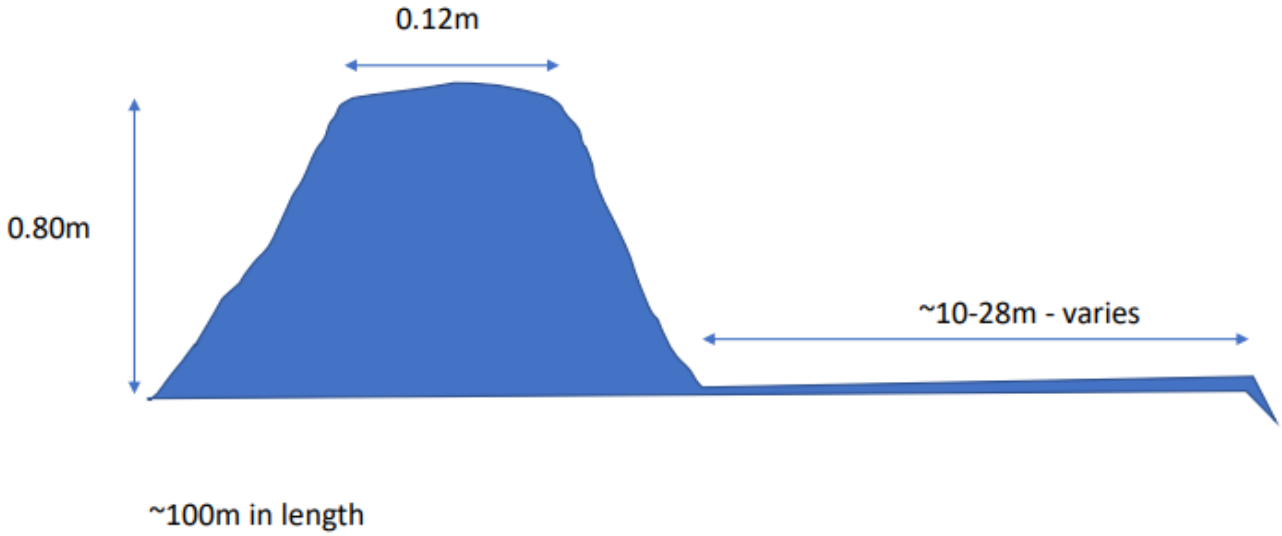
Asset ID	Asset type/sub-type	Description	Grade
CL22	Defence - Embankment	Earth embankment with stone and sheet piling on River Ehen	3
CL23	Structure – Outfall	Outfall located on River Ehen	3
CL24	Defence - Wall	Wall located off Main Street	3

4.0 Findings and Recommendations

The following is a summary of the findings and recommendations to bring all asset elements to at least "fair" condition, grade 3.

CL1 – Embankment

Small earth embankment protecting residential properties behind.



Comments

Variant weighting used for crest as <4m wide. Drainage pipe running through entire width of embankment, low spots, some animal holes and rutting on crest, landward face and exposed face have some holes and uneven slopes but are well vegetated. Undermining, minor erosion and light foreign objects present on channel side but currently stable.

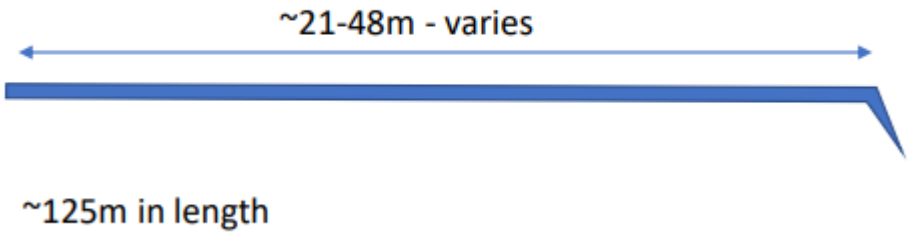
Grade = 4, Poor

Years	Recommendations	Cumulative Cost (£)
Immediate	• Install none return valve to drainage pipe	£400.00
1	• Inspect embankment annually and infill any identified low spots on crest with topsoil and lay down grass seed • Manage vegetation to avoid undesirable vegetation growth and maintain grass growth • Consider pest control	£600.00
5	• Continue to inspect the embankment yearly to keep track of and identify potential issues • Continue vegetation management to prevent the growth of undesirable vegetation on embankment	£3,500.00

	• Infill identified low spots on crest with topsoil and lay down grass seed • Monitor condition of landward toe to ensure vehicle use does not damage asset – infill low spots and lay down grass seed in areas of vegetation loss	
10	• Continue yearly inspections and vegetation management • If extensive damage has been incurred to the embankment, reprofile the bank and lay down grass seed	£12,500.00
15	• Continue yearly inspections and vegetation management • If extensive damage has been incurred to the embankment, reprofile the bank and lay down grass seed	£16,600.00

CL2 – Natural High Ground

Natural high ground located in a grass field in front of residential properties with a width of 21-48m between the channel side and road.



4.1.1 Comments

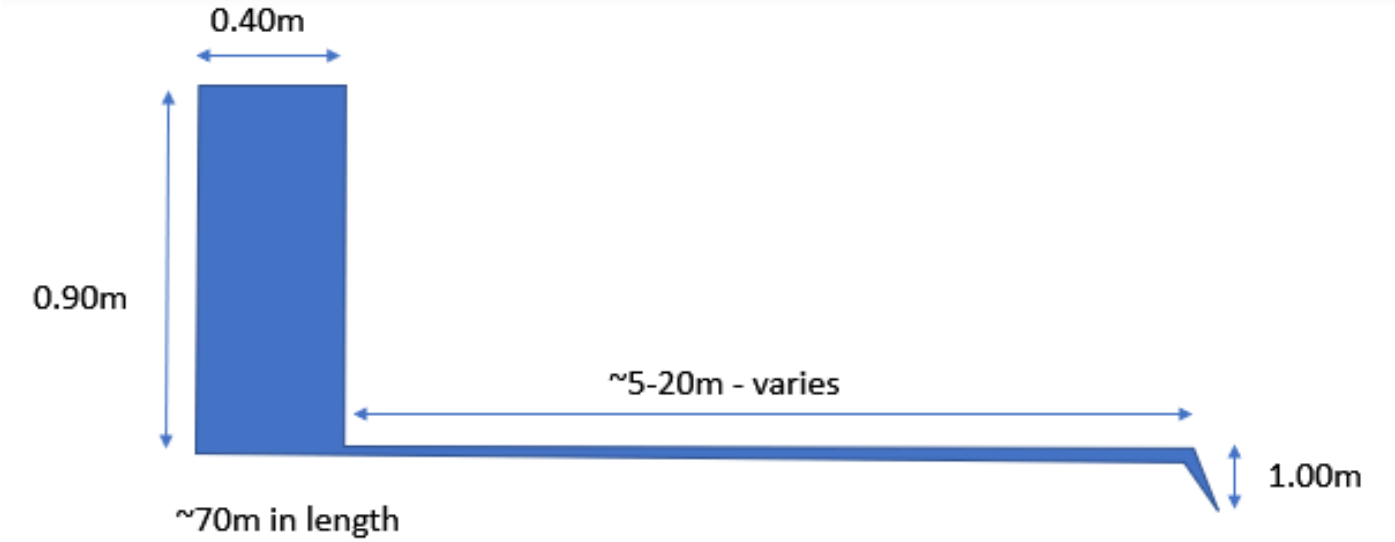
Significant undermining, erosion and presence of light foreign objects on channel side. High ground in good condition.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Conduct visual asset inspections annually, monitor erosion, maintain grass on high ground and ensure vegetation is kept stable and not blocking channel	£600.00
5	• Continue to inspect the high ground yearly to keep track of and identify potential issues • Continue with vegetation management and remove unstable trees	£3,100.00
10	• Continue yearly inspections and vegetation management • If considerate amounts of erosion are being incurred to the channel side, install coir erosion protection matting	£13,200.00
15	• Continue yearly inspections and vegetation management • If extensive erosion has been incurred to the channel side, consider reprofiling bank and installing rock armour	£21,500.00

CL3 – Wall

Stone wall next to road protecting residential properties but not designed as a flood wall.



4.1.2 Comments

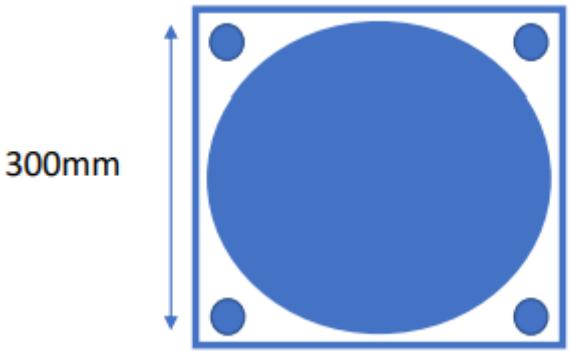
Variant weightings used for both faces as no revetments. Significant mortar loss to crest, holes through wall, bulging of wall where light foreign objects are growing in front on wall, distorting its shape and some erosion to channel side.

Grade = 4, Poor

Years	Recommendations	Cumulative Cost (£)
Immediate	• Rebuild wall and remove trees in front of wall	£1,900.00
1	• Conduct visual asset inspections annually • Carry out minor repairs to bricks and mortar and maintain grass on berm	£200.00
5	• Continue to inspect the wall yearly to keep track of and identify potential issues • Carry out small repairs to brickwork and management of surrounding vegetation	£1,000.00
10	• Carry out repointing of wall • Continue with annual visual asset inspections and management of surrounding vegetation	£2,100.00
15	• If there has been any serious structural damage to the wall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage • If extensive erosion has been incurred to the channel side, consider reprofiling bank and installing rock armour	£10,100.00

CL4 – Outfall

300mm diameter flapped outfall with concrete apron located on channel side in front of wall. Owner and operator unknown.



4.1.3 Comments

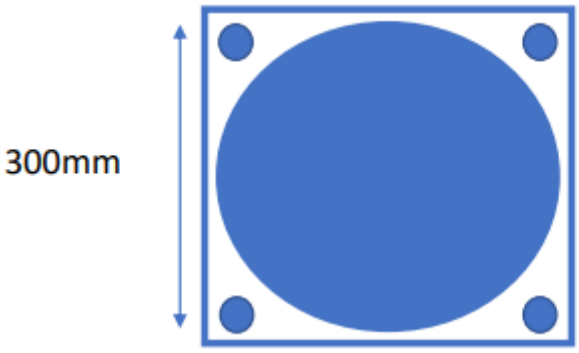
Vegetation around headwall. Unable to see through pipe and no CCTV footage available.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Conduct annual visual asset inspections and maintain surrounding vegetation to avoid damage incurring to outfall	£600.00
5	• Continue to inspect the outfall yearly, including CCTV inspections of the pipe every 5 years • Monitor and remove moss growth and vegetation growth on headwall to reduce damage to the headwall	£3,500.00
10	• Continue yearly inspections of outfall including CCTV inspections of pipe every 5 years • Continue with vegetation management • Carry out small repairs to brick and mortar loss	£6,900.00
15	• Continue yearly inspections of outfall and manage vegetation growth • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ relevant operative to repair damage	£17,400.00

CL5 – Outfall

300mm diameter flapped outfall with no apron located on channel side in front of wall. Owner and operator unknown.



4.1.4 Comments

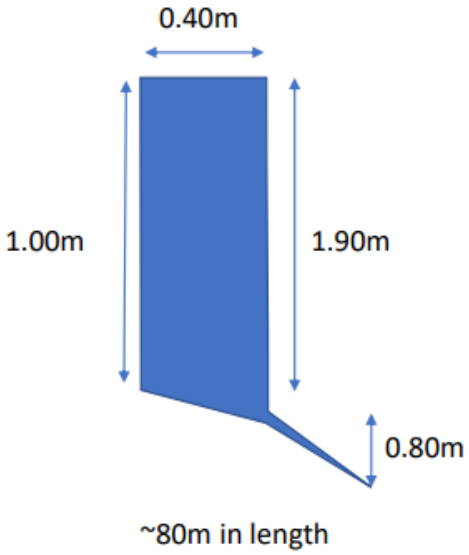
Outfall in good condition, very minor corrosion present on frame and flap valve. Unable to see through pipe and no CCTV footage available.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Conduct annual visual asset inspections and maintain surrounding vegetation to avoid damage incurring to outfall	£600.00
5	• Continue to inspect the outfall yearly, including CCTV inspections of the pipe every 5 years • Monitor and remove moss growth and vegetation growth on headwall to reduce damage to the headwall	£3,500.00
10	• Continue yearly inspections of the outfall including CCTV inspections of the pipe every 5 years • Continue with vegetation management	£6,900.00
15	• Continue yearly inspections of the outfall and manage vegetation growth • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£17,400.00

CL6 – Wall

Stone wall with 6 highway outfalls in wall connecting to previous wall, also not a flood wall.



4.1.5 Comments

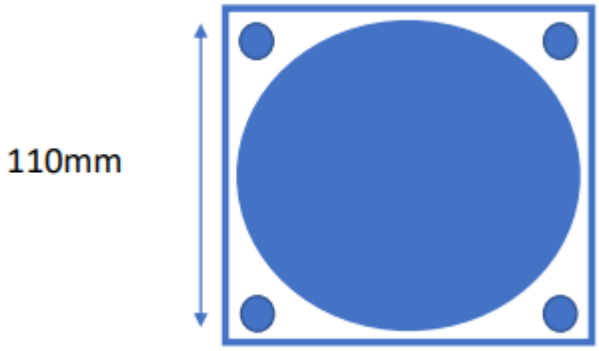
Heavy foreign objects growing towards channel on berm and channel side and undermining on channel side causing channel side to be unstable. Ivy growth on wall, heavy foreign objects growing close to wall causing bulging to wall and capping stones lost from crest halfway across wall.

Grade = 4, Poor

Years	Recommendations	Cumulative Cost (£)
Immediate	• Rebuild wall, remove unstable trees, and remove trees next to wall	£5,000.00
1	• Conduct visual asset inspections annually • Maintain surrounding vegetation to avoid wall incurring structural damage	£200.00
5	• Continue to inspect the wall yearly to keep track of and identify potential issues • Small repairs to brickwork and management of surrounding vegetation	£1,000.00
10	• Carry out repointing of wall and continue with small repairs to brickwork and management of surrounding vegetation	£2,100.00
15	• If there has been any serious structural damage to the wall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage • If extensive erosion has been incurred to the channel side, consider reprofiling bank and installing rock armour	£11,000

CL7 – Outfall

110mm diameter flapped highway outfall located within stone wall.



4.1.6 Comments

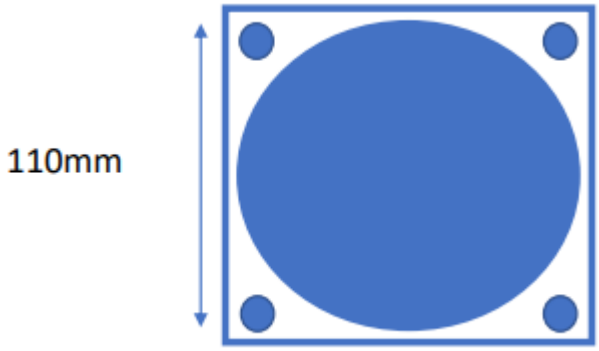
No signs of corrosion to flap valve or frame, pipe has minor leaf debris but no blockages or damage. Downstream headwall has some cracks, vegetation growth and mortar loss.

Grade = 2, Good

Years	Recommendations	Cumulative Cost (£)
1	• Conduct annual visual asset inspections and maintain surrounding vegetation to avoid damage incurring to outfall	£600.00
5	• Continue with annual inspections of the outfall • Monitor and remove moss growth and vegetation growth on headwall to reduce damage to the headwall	£3,500.00
10	• Continue with annual inspections of the outfall • Continue with vegetation management • Conduct small brick and mortar repairs on headwall	£6,900.00
15	• Continue with annual inspections of the outfall and vegetation management • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£14,800.00

CL8 – Outfall

110mm diameter flapped highway outfall located within stone wall.



4.1.7 Comments

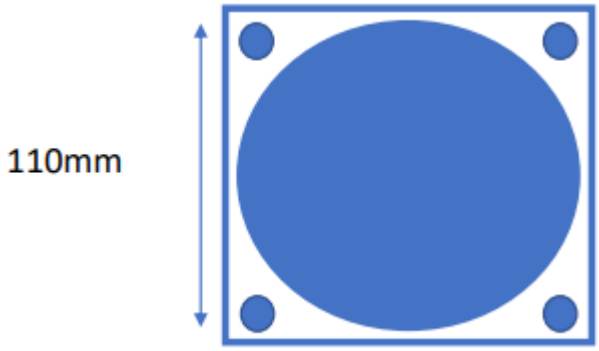
No signs of corrosion to flap valve or frame, pipe has minor leaf debris but no blockages or damage. Minor crack to downstream headwall, vegetation growth and mortar loss.

Grade = 2, Good

Years	Recommendations	Cumulative Cost (£)
1	• Conduct annual visual asset inspections and maintain surrounding vegetation to avoid damage incurring to outfall	£600.00
5	• Continue with annual inspections of the outfall • Monitor and remove moss growth and vegetation growth on headwall to reduce damage to the headwall	£3,500.00
10	• Continue with annual inspections of the outfall • Continue with vegetation management • Conduct small brick and mortar repairs on headwall	£6,900.00
15	• Continue with annual inspections of the outfall and vegetation management • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£14,800.00

CL9 – Outfall

110mm diameter flapped highway outfall located within stone wall.



4.1.8 Comments

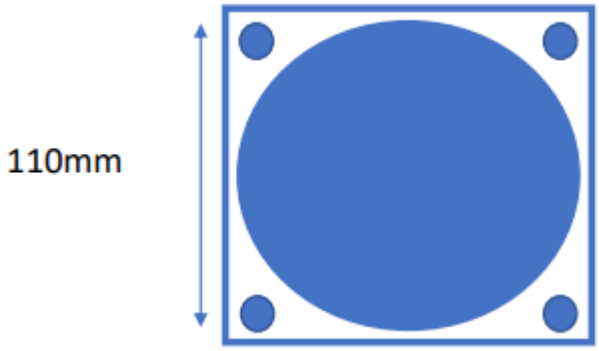
No corrosion to flap valve or frame. Cracks and mortar loss on headwall. Pipe has minor leaf debris but no blockages or damage.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Conduct annual visual asset inspections and maintain surrounding vegetation to avoid damage incurring to outfall	£600.00
5	• Continue with annual inspections of the outfall • Monitor and remove moss growth and vegetation growth on headwall to reduce damage to the headwall	£3,500.00
10	• Continue with annual inspections of the outfall • Continue with vegetation management • Conduct small brick and mortar repairs on headwall	£6,900.00
15	• Continue with annual inspections of the outfall and vegetation management • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£14,800.00

CL10 – Outfall

110mm diameter flapped highway outfall located within stone wall.



4.1.9 Comments

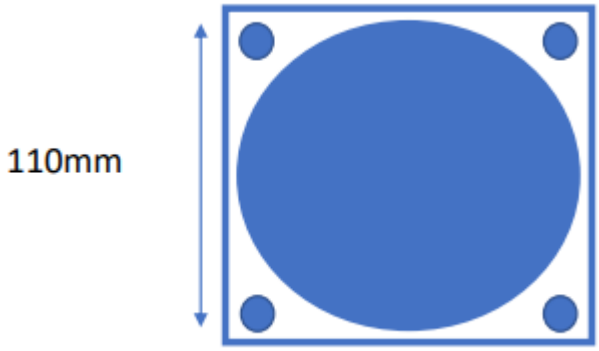
Ivy growth around frame and headwall. No corrosion to flap valve. Minor cracks and vegetation growth on headwall. Pipe has minor leaf debris but no blockages or damage.

Grade = 2, Good

Years	Recommendations	Cumulative Cost (£)
1	• Conduct annual visual asset inspections and maintain surrounding vegetation to avoid damage incurring to outfall	£600.00
5	• Continue with annual inspections of the outfall • Monitor and remove moss growth and vegetation growth on headwall to reduce damage to the headwall	£3,500.00
10	• Continue with annual inspections of the outfall • Continue with vegetation management • Conduct small brick and mortar repairs on headwall	£6,900.00
15	• Continue with annual inspections of the outfall and vegetation management • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£14,800.00

CL11 – Outfall

110mm diameter flapped highway outfall located within stone wall.



4.1.10 Comments

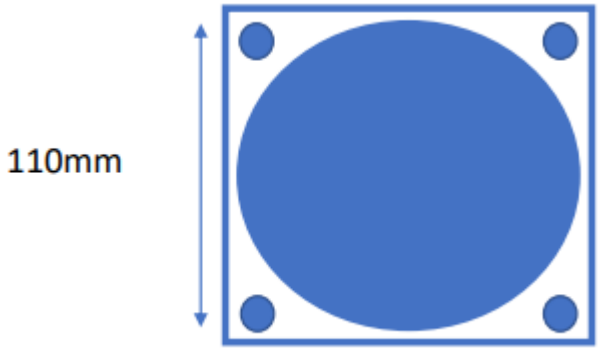
Ivy growth around frame and headwall. No corrosion to flap valve. Minor cracks and vegetation growth on headwall. Pipe has vegetation debris but no blockages or damage.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Conduct annual visual asset inspections and maintain surrounding vegetation to avoid damage incurring to outfall	£600.00
5	• Continue with annual inspections of the outfall • Monitor and remove moss growth and vegetation growth on headwall to reduce damage to the headwall	£3,500.00
10	• Continue with annual inspections of the outfall • Continue with vegetation management • Conduct small brick and mortar repairs on headwall	£6,900.00
15	• Continue with annual inspections of the outfall and vegetation management • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£14,800.00

CL12 – Outfall

110mm diameter flapped highway outfall located within stone wall.



4.1.11 Comments

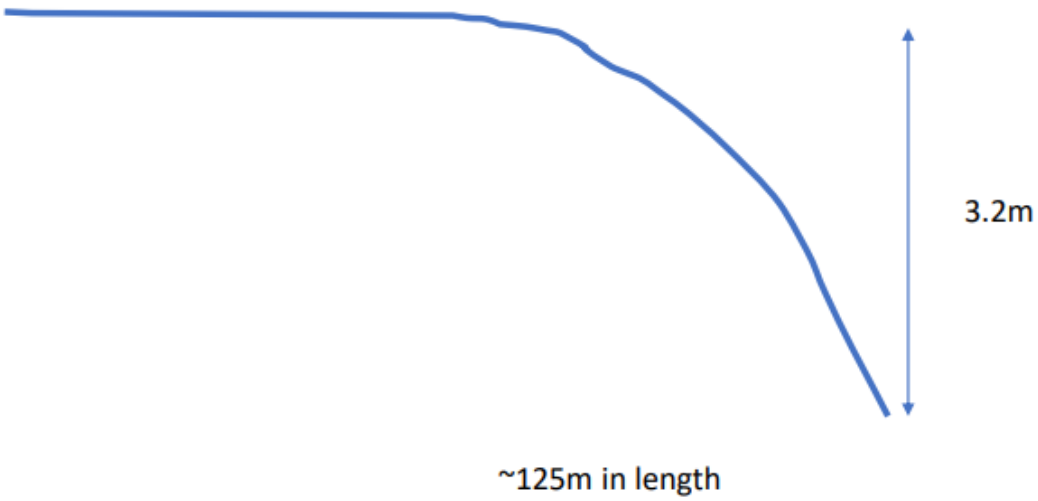
No corrosion to flap valve or frame. Minor cracks, mortar loss and minor vegetation growth on headwall. Pipe has minor leaf debris but no blockages or damage.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Conduct annual visual asset inspections and maintain surrounding vegetation to avoid damage incurring to outfall	£600.00
5	• Continue with annual inspections of the outfall • Monitor and remove moss growth and vegetation growth on headwall to reduce damage to the headwall	£3,500.00
10	• Continue with annual inspections of the outfall • Continue with vegetation management • Conduct small brick and mortar repairs on headwall	£6,900.00
15	• Continue with annual inspections of the outfall and vegetation management • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£14,800.00

CL13 – Natural High Ground

Stretch of natural high ground with vegetation and trees.



4.1.12 Comments

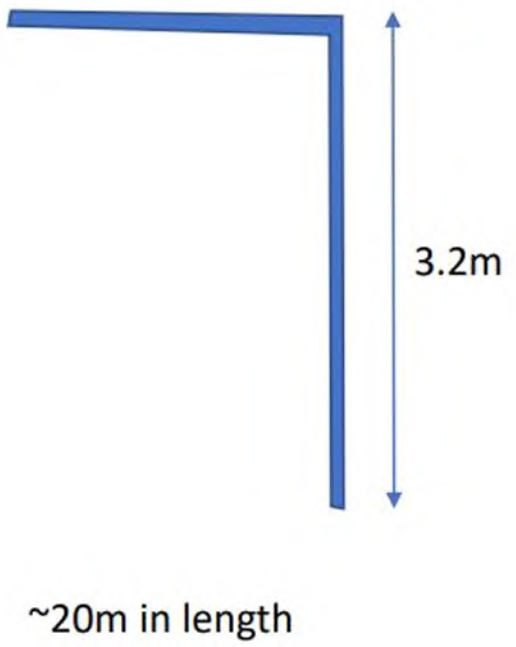
Significant undermining, erosion, and presence of light foreign objects on channel side. High ground in good condition.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Conduct visual asset inspections annually, monitor erosion and ensure vegetation is kept stable and not blocking channel	£700.00
5	• Continue to inspect high ground yearly to keep track of and identify potential issues • Continue with vegetation management and remove unstable trees	£5,500.00
10	• Continue yearly inspections and vegetation management • If considerate amounts of erosion are being incurred to the channel side, install erosion protection matting	£17,900.00
15	• Continue yearly inspections and vegetation management • If extensive erosion has been incurred to the channel side, consider reprofiling bank and installing further erosion protection measures such as rock armour	£34,200.00

CL14 – Engineered High Ground

Masonry retaining wall at edge of road with metal fencing above.



4.1.13 Comments

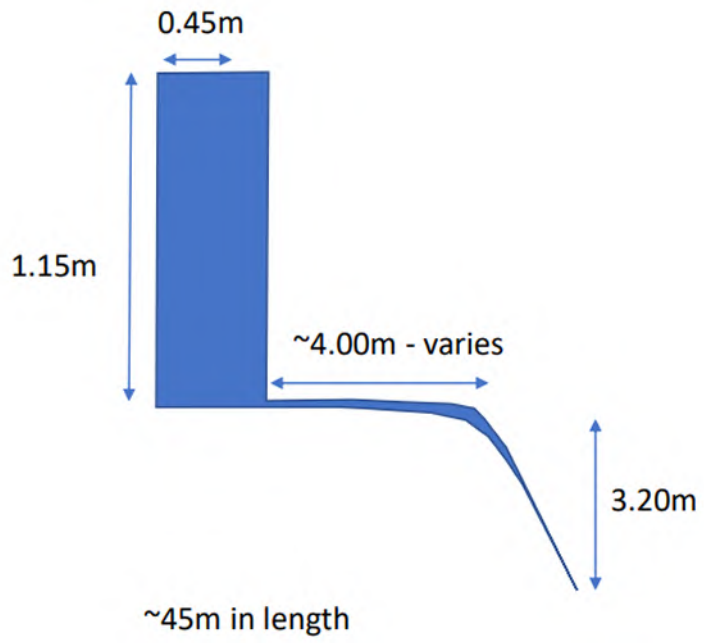
Light foreign objects and ivy growing in front of and on top of channel side wall. High ground is road in good condition. Heavy foreign object upstream with roots growing into channel side brickwork.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Conduct visual asset inspections annually and cut back surrounding vegetation to avoid damaging asset	£600.00
5	• Continue with annual visual asset inspections and vegetation management • Conduct small brick and mortar repairs	£1,100.00
10	• Continue with annual visual asset inspections and vegetation management • Consider repointing brickwork	£2,200.00
15	• Continue with annual visual asset inspections and vegetation management • If there has been any serious structural damage to the engineered high ground such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£12,000.00

CL15 – Wall

Masonry wall with capping stones with berm and channel side heavily vegetated with tree growth through wall.



4.1.14 Comments

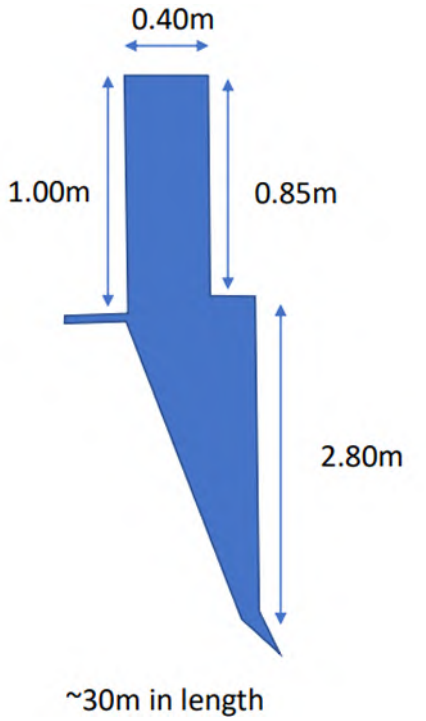
Several heavy foreign objects on berm and channel side. Severe mortar loss in landward face, exposed face difficult to inspect but wall covered in ivy and some tree roots and growing through it. Crest is uneven where ivy has grown around it.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Conduct visual asset inspections annually • Maintain surrounding vegetation including ivy removal to avoid wall incurring structural damage	£200.00
5	• Continue to inspect the wall yearly to keep track of and identify potential issues • Small repairs to brickwork and management of surrounding vegetation	£1,200.00
10	• Carry out repointing of wall and continue with small repairs to brickwork and management of surrounding vegetation	£2,400.00
15	• If there has been any serious structural damage to the wall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£7,700.00

CL16 – Wall

Brick wall with concrete landward face connecting to channel side brick retaining wall.



4.1.15 Comments

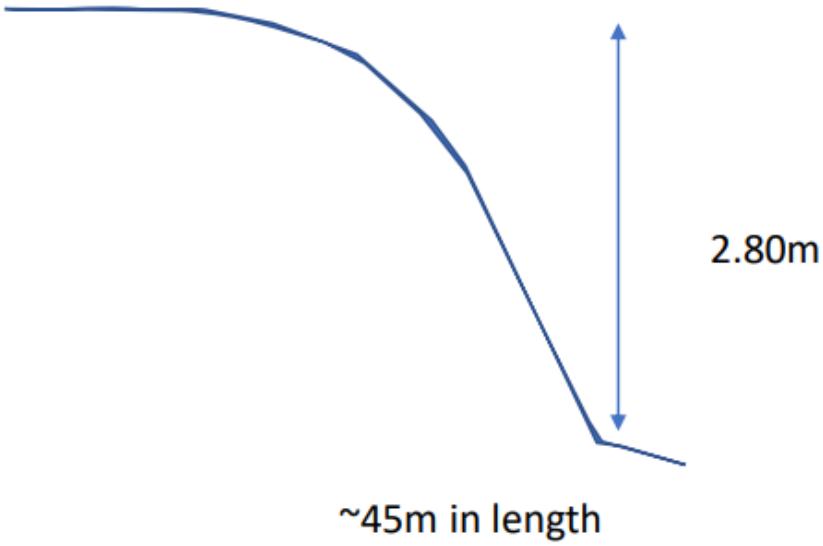
Extensive ivy growth, channel side wall is walling down with severe brick loss and root penetration. Heavy foreign objects growing on channel side causing brick displacement and loss. Crest is uneven due to brick loss but landward face is made from concrete slabs in good condition.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Conduct visual asset inspections annually • Maintain surrounding vegetation to avoid wall incurring structural damage	£200.00
5	• Continue to inspect the wall yearly to keep track of and identify potential issues • Small repairs to brickwork and management of surrounding vegetation	£1,200.00
10	• Carry out repointing of wall and continue with small repairs to brickwork and management of surrounding vegetation	£4,800.00
15	• If there has been any serious structural damage to the wall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£8,200.00

CL17 – Natural High Ground

Natural high ground heavily vegetated with tree growth with brick building directly behind.



4.1.16 Comments

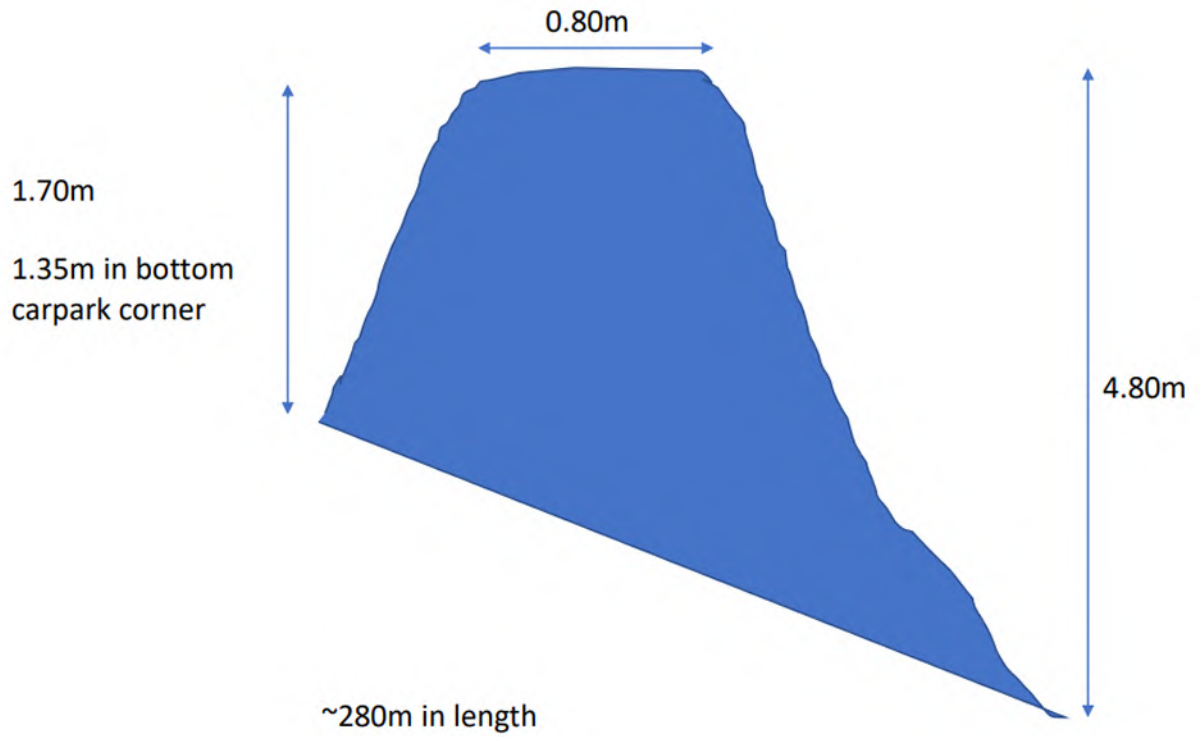
Heavy foreign objects on channel side leaning towards channel. Building <3m from channel on high ground.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Remove unstable trees • Conduct visual asset inspections annually, monitor erosion and movement which could affect nearby building • Ensure vegetation is kept stable and not blocking channel	£200.00
5	• Continue to inspect high ground yearly to keep track of and identify potential issues • Continue with vegetation management and remove unstable trees	£1,200.00
10	• Continue yearly inspections and vegetation management • If considerate amounts of erosion are being incurred to the channel side, install coir erosion protection matting	£4,800.00
15	• Continue yearly inspections and vegetation management • If extensive erosion has been incurred to the channel side, consider reprofiling bank and installing further erosion protection measures such as rock armour	£8,200.00

CL18 – Embankment

Earth embankment with unknown construction materials and unstable tree-ridden channel side, reducing stability of embankment. Unlikely to have clay core and may be comprised of waste material.



4.1.17 Comments

Low points and rutting in crest but well vegetated. Variant used for exposed face due to steepness. Exposed and landward faces have isolated bare patches. Telegraph pole behind embankment but embankment build around it. Severe undermining of channel side around heavy foreign objects with extensive root exposure.

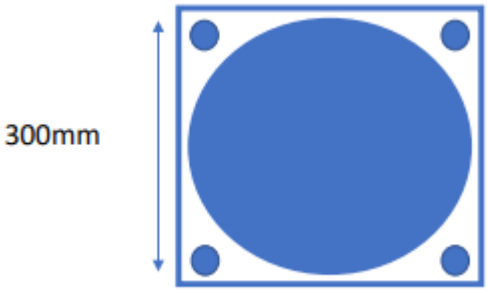
Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Consider installing erosion protection to channel side such as rock armour • Inspect embankment annually and infill any identified low spots on crest with topsoil and lay down grass seed • Manage vegetation to avoid undesirable vegetation growth	£7,200.00
5	• Continue to inspect the embankment yearly to keep track of, identify potential issues and monitor stability of telegraph pole within embankment	£33,400.00

	• Continue vegetation management to prevent the growth of undesirable vegetation on embankment • Infill identified low spots on crest with topsoil and lay down grass seed	
10	• Continue yearly inspections and vegetation management • Infill any identified low spots on crest with topsoil and lay down grass seed • If extensive damage has been incurred to embankment, reprofile bank and lay down grass seed	£90,100.00
15	• Continue yearly inspections and vegetation management • Infill any identified low spots on crest with topsoil and lay down grass seed • If extensive damage has been incurred to embankment, reprofile bank and lay down grass seed • Consider employing engineer to assess asset condition in detail to identify potential structural issues with embankment, employ relevant operative to repair damage	£166,600.00

CL19 – Outfall

300mm outfall on channel side of embankment with damaged concrete headwall.



4.1.18 Comments

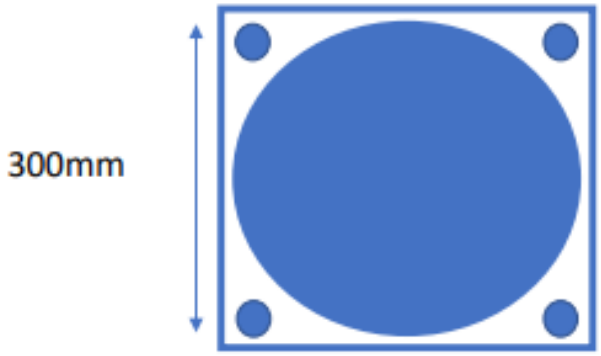
Drainage pipe halfway between wall and building on high ground. Unable to see through pipe and no CCTV footage available. Vegetation around headwall and at base of pipe.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Investigate stability of headwall, rebuild if necessary • Conduct CCTV inspection of pipe to assess condition • Conduct annual visual asset inspections and provide ongoing management of surrounding vegetation to avoid damage incurring to outfall	£600.00
5	• Continue to inspect the outfall yearly, including CCTV inspections of the pipe every 5 years • Monitor and remove moss growth and vegetation growth on headwall to reduce damage to the headwall • Carry out small repairs to any brick and mortar loss on headwall	£3,500.00
10	• Continue yearly inspections of outfall including CCTV inspections of pipe every 5 years • Continue with vegetation management • Carry out small repairs to any brick and mortar loss on headwall	£6,900.00
15	• Continue yearly inspections of outfall and manage vegetation growth • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ relevant operative to repair damage	£17,400.00

CL20 – Outfall

150mm clay drainage pipe located on channel side of embankment surrounded by rocks providing unstable headwall.



4.1.19 Comments

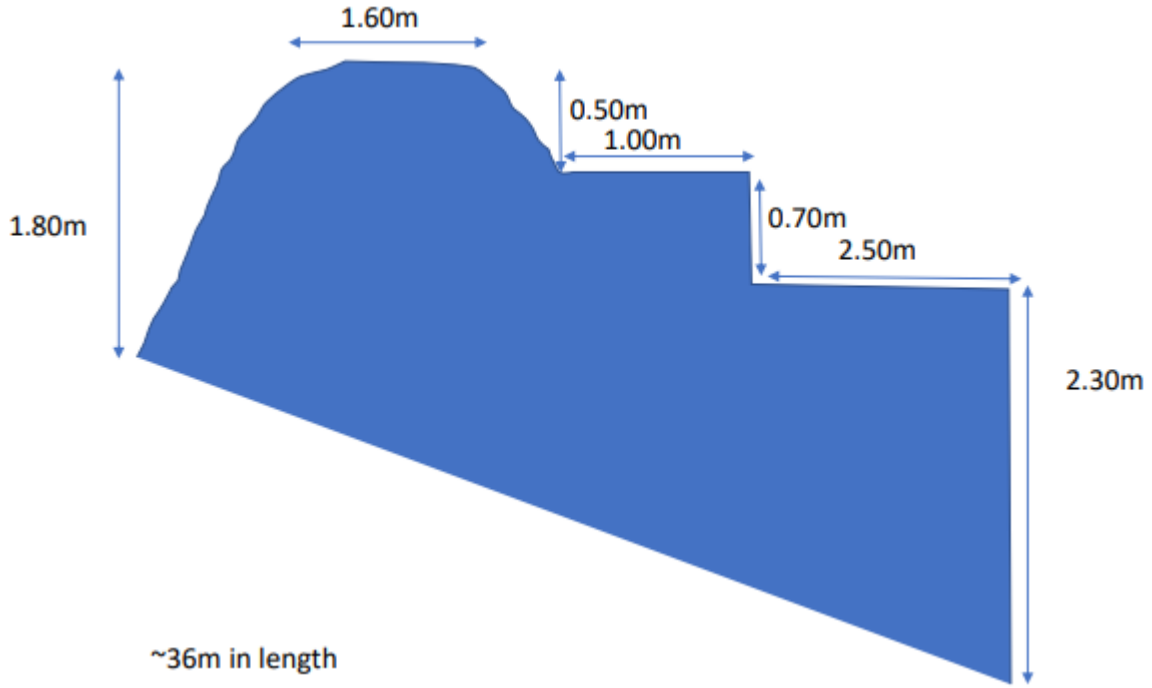
Downstream headwall in pieces. Unable to see through pipe and no CCTV footage available.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Rebuild headwall • Conduct CCTV inspection of pipe to assess condition • Conduct annual visual asset inspections and provide ongoing management of surrounding vegetation to avoid damage incurring to outfall	£600.00
5	• Continue to inspect the outfall yearly, including CCTV inspections of the pipe every 5 years • Monitor and remove moss growth and vegetation growth on headwall to reduce damage to the headwall • Carry out small repairs to any brick and mortar loss on headwall	£3,500.00
10	• Continue yearly inspections of outfall including CCTV inspections of pipe every 5 years • Continue with vegetation management • Carry out small repairs to any brick and mortar loss on headwall	£6,900.00
15	• Continue yearly inspections of outfall and manage vegetation growth • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ relevant operative to repair damage	£17,400.00

CL21 – Embankment

Earth embankment with gabion basket and sheet piling exposed faces and concrete berm.



4.1.20 Comments

Berm 2 and channel side in good condition with minor cosmetic defects to sheet piles. Vegetation growth through gabion baskets with a few broken wires but no gabion displacement. Uneven ground on exposed face 1 and landward face but well vegetated. Rutting and low spots in isolated places on crest. Variants used on crest as less than 4m wide and landward face due to steepness.

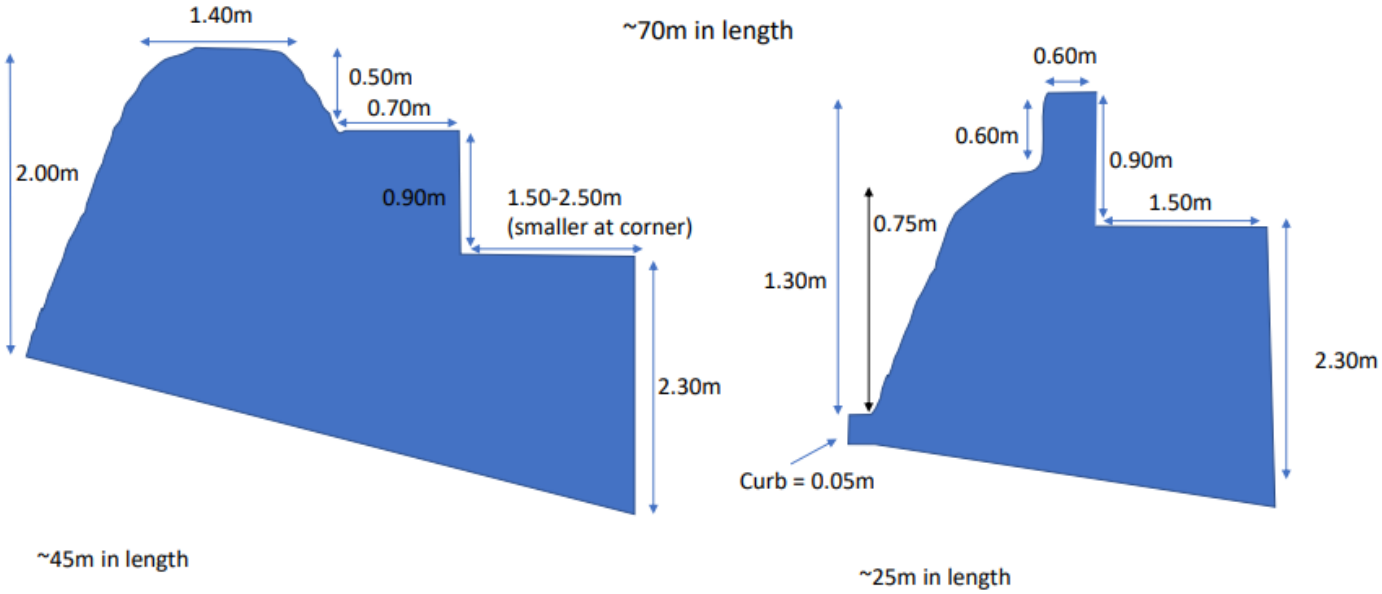
Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Repair gabion baskets and remove vegetation growing through • Inspect embankment annually and infill any identified low spots on crest with topsoil and lay down grass seed • Manage vegetation to avoid undesirable vegetation growth	£200.00
5	• Continue to inspect embankment yearly to keep track of, identify potential issues • Continue vegetation management to prevent growth of undesirable vegetation on embankment • Infill identified low spots on crest with topsoil and lay down grass seed	£1,100.00
10	• Continue yearly inspections and vegetation management	£2,500.00

	• If extensive damage has been incurred to embankment, reprofile bank and lay down grass seed • Repaint sheet piling • Repair any damage to gabion baskets	
15	• Continue yearly inspections and vegetation management • If extensive damage has been incurred to embankment, reprofile bank and lay down grass seed • Repair any damage to concrete apron and gabion baskets • Consider employing engineer to assess asset condition in detail to identify potential structural issues with embankment, employ relevant operative to repair damage	£9,600.00

CL22 – Embankment

Earth embankment with stone wall and sheet piling exposed faces and concrete berm. Crest height and embankment width reduce as earth landward face diminishes and crest changes to stone crest.



4.1.21 Comments

Minor vegetation growth within berm 1 and exposed face 2 with minor mortar loss. Uneven crest with some low spots but well vegetated. Berm 2 and channel side in good condition with minor cosmetic defects to sheet piling. Landward face and exposed face 1 are well vegetated but uneven. Landward face 2 around corner and has minor vegetation growing through stone and minor mortar loss.

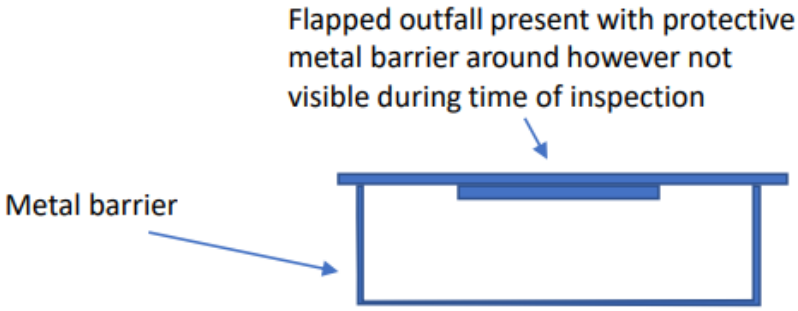
Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Inspect embankment annually and infill any identified low spots on crest with topsoil and lay down grass seed • Repair mortar loss and remove vegetation growing through • Manage vegetation to avoid undesirable vegetation growth	£200.00
5	• Continue to inspect embankment yearly to keep track of, identify potential issues • Continue vegetation management to prevent the growth of undesirable vegetation on embankment • Conduct small repairs on brick and mortar loss • Infill identified low spots on crest with topsoil and lay down grass seed	£1,600.00
10	• Continue yearly inspections and vegetation management	£3,400.00

	• If extensive damage has been incurred to embankment, reprofile bank and lay down grass seed • Continue with small repairs of brick and mortar loss • Repaint sheet piling • If extensive damage has been incurred to wall, rebuild wall	
15	• Continue yearly inspections and vegetation management • If extensive damage has been incurred to embankment, reprofile bank and lay down grass seed • Repair any damage to concrete apron and wall • Consider employing engineer to assess asset condition in detail to identify potential structural issues with embankment, employ relevant operative to repair damage	£9,600.00

CL23 – Outfall

Flapped outfall with unknown diameter located behind metal barrier which obstructs view of outfall.



4.1.22 Comments

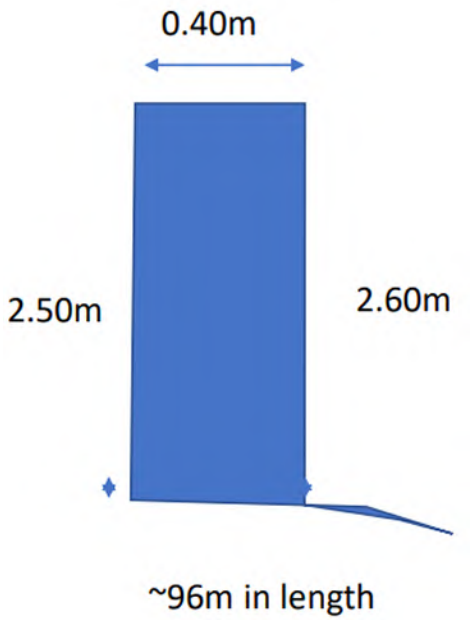
Minor corrosion to barrier. Unable to see headwall and pipe due to high water level and barrier around.

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Investigate dimensions and condition of outfall • Carry out CCTV inspection to assess pipe condition • Conduct annual visual asset inspections to assess the condition of the asset	£600.00
5	• Continue to inspect outfall yearly, including CCTV inspections of pipe every 5 years • Monitor stability of metal barrier and replace if necessary	£3,500.00
10	• Continue yearly inspections of the outfall • Manage any vegetation growth which could damage asset	£6,900.00
15	• Continue yearly inspections of the outfall and manage vegetation growth • If there has been any serious structural damage to the outfall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£23,700.00

CL24 – Wall

High stone wall with capping stones located off right bank and going away from main channel towards village.



4.1.23 Comments

Minor vegetation growth through crest. Minor mortar loss on exposed face and a couple of holes on both faces, not whole way though. Few bricks missing for drainage

Grade = 3, Fair

Years	Recommendations	Cumulative Cost (£)
1	• Repair holes in wall and remove vegetation • Conduct visual asset inspections annually • Maintain surrounding vegetation to avoid wall incurring structural damage	£200.00
5	• Continue to inspect the wall yearly to keep track of and identify potential issues • Conduct small repairs to brick and mortar loss and manage surrounding vegetation	£1,100.00
10	• Carry out repointing of wall and continue with small repairs to brickwork and management of surrounding vegetation	£2,200.00
15	• If there has been any serious structural damage to the wall over time such as cracking or movement, employ an engineer to investigate. If investigations have found structural damage, employ the relevant operative to repair the damage	£9,200.00

5.0 Summary Costs of Repair and Maintenance

TABLE 2: TOTAL COST

Asset	Immediate	1 Year	5 Years	10 Years	15 Years
CL1	£400.00	£600.00	£3,500.00	£12,500.00	£16,600.00
CL2		£600.00	£3,100.00	£13,200.00	£21,500.00
CL3	£1,900.00	£200.00	£1,000.00	£2,100.00	£10,100.00
CL4		£600.00	£3,500.00	£6,900.00	£17,400.00
CL5		£600.00	£3,500.00	£6,900.00	£17,400.00
CL6	£5,000.00	£200.00	£1,000.00	£2,100.00	£11,000.00
CL7		£600.00	£3,500.00	£6,900.00	£14,800.00
CL8		£600.00	£3,500.00	£6,900.00	£14,800.00
CL9		£600.00	£3,500.00	£6,900.00	£14,800.00
CL10		£600.00	£3,500.00	£6,900.00	£14,800.00
CL11		£600.00	£3,500.00	£6,900.00	£14,800.00
CL12		£600.00	£3,500.00	£6,900.00	£14,800.00
CL13		£700.00	£5,500.00	£17,900.00	£34,200.00
CL14		£600.00	£1,100.00	£2,200.00	£12,000.00
CL15		£200.00	£1,200.00	£2,400.00	£7,700.00
CL16		£200.00	£1,000.00	£2,000.00	£5,900.00
CL17		£200.00	£1,200.00	£4,800.00	£8,200.00
CL18		£7,200.00	£33,400.00	£90,100.00	£166,600.00
CL19		£600.00	£3,500.00	£6,900.00	£17,400.00
CL20		£600.00	£3,500.00	£6,900.00	£17,400.00
CL21		£200.00	£1,100.00	£2,500.00	£9,600.00
CL22		£200.00	£1,600.00	£3,400.00	£9,600.00
CL23		£600.00	£3,500.00	£6,900.00	£23,700.00
CL24		£200.00	£1,100.00	£2,200.00	£9,200.00
Total	£7,300.00	£18,000.00	£94,000.00	£233,700.00	£504,300.00

6.0 Summary

Overall, three of the flood assets are in poor condition, two are walls which will require reconstruction, and the first of the embankments requires the installation of a none return valve to retain its flood defence function. There are six outfalls in good condition and the remaining fourteen flood assets are in fair condition. All assets are no longer inspected by the Environment Agency and have a limited flood protection function, the capacity of the channel itself and the lower land on the opposite bank provides some protection to the site.

The associated costs from immediate action to 15 years ahead involve visual asset inspections which will allow the condition of each asset to be assessed in order to ensure the assets remain in good working order. Vegetation management is also a very consistent cost for almost all assets since root penetration and undesirable vegetation can destabilise assets which could cause them to fail. Mortar repair is a minor but regular maintenance requirement for all defences and structures containing brickwork to ensure internal degradation to brick structures is reduced.

Larger costs which may be required after a longer period of time include the replacement of sheet piling, bank reprofiling and repointing of walls. These costs would be necessary to ensure the assets remain stable.

The recommendations made in Section 4 emphasise monitoring and management to maintain assets to allow them to reach or maintain a condition grade of 3 - ‘Fair’. Monitoring and management makes up most of the 5 and 10 year costings outlined in Table 2, including yearly inspections, vegetation management, and minor repair work where required.

For the 15-year period, more intrusive, structural recommendations have been made to maintain assets to achieve condition grade 3 - ‘Fair’. These recommendations make assumptions that the assets will degrade over time, and that erosion of the channel side will continue. Investigations by engineers will be required to determine any further work required at the time.

Appendix A: Asset inspection logs

Asset inspection logs including photos are available to download as PDF documents.

Asset ID	CL1	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Defence	**Asset Type - Subtype**	Embankment				
Asset Location	Cleator						
Description	Near to Millers Walk, Cleator						
Current Asset Condition		**Target condition**	3				
Element Sequence	**Element Type**	**Material**	**Photo ref**	**Notes**	**ENI**	**Weighting**	**Condition**
1	Crest	Earth				9	3
2	Landward Face	Earth				7	3
3	Exposed Face	Earth				7	3
4	Channel Side	Earth				5	3
5	Berm	Earth				5	2
6							
7							
8							
9							
10							
11							
Calculated	3	**Worst**		**Override**			
Override Reason							
Comments	Variant weighting used for crest as <4m wide. Drainage pipe running through entire width of embankment, low spots, some animal holes and rutting on crest, Landward face and exposed face have some holes and uneven slopes but are well vegetated. Undermining, minor erosion and light foreign objects present on channel side but currently stable.						
Recommendations	Infill low spots on crest, remove drainage pipe from embankment and consider pest control.						

Asset ID		**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Channel	**Asset Type - Subtype**	Natural High Ground				
Asset Location	Cleator						
Description	Near to Millers Walk, Cleator						
Current Asset Condition	CL2	**Target condition**	3				

Element Sequence	**Element Type**	**Material**	**Photo ref**	**Notes**	**ENI**	**Weighting**	**Condition**
1	High ground	Earth				2	2
2	Channel Side	Earth				5	3
3							
4							
5							
6							
7							
8							
9							
10							
11							

Calculated	3	**Worst**		**Override**			
Override Reason							

Comments	Significant undermining, erosion and presence of light foreign objects on channel side. High ground in good condition.
Recommendations	Monitor erosion, consider installing erosion protection layer to channel side.






Asset ID	CL3	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Defence	**Asset Type - Subtype**	Wall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				
Element Sequence	**Element Type**	**Material**	**Photo ref**	**Notes**	**ENI**	**Weighting**	**Condition**
1	Crest	Stone				7	3
2	Landward Face	Stone				9	4
3	Exposed Face	Stone				9	4
4	Channel Side	Earth				5	3
5	Berm	Earth				5	2
6							
7							
8							
9							
10							
11							
Calculated	3	**Worst**		**Override**	**4**		
Override Reason	Critical element has lower grading						
Comments	Variant weightings used for both faces as no revetments. Significant mortar loss to crest, holes through wall, bulging of wall where light foreign objects are growing in front on wall, distorting its shape and minor erosion to channel side.						
Recommendations	Rebuild wall and remove trees in front of wall.						

Asset ID	CL4	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Frame	Metal				7	2
2	Flap valve	Metal				9	2
3	Pipe	Unknown			X	9	3
4	Apron	Concrete				5	2
5	Downstream headwall	Stone and concrete				8	3
6							
7							
8							
9							
10							
11							

Calculated	2	**Worst**		**Override**	**3**	
Override Reason	Critical element has lower grading					
Comments	Vegetation around headwall. Unable to see through pipe and no CCTV footage available.					
Recommendations	Conduct a CCTV survey to inspect pipe and remove vegetation around headwall.					

Asset ID	CL5	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Frame	Metal				7	2
2	Flap valve	Metal				9	2
3	Pipe	Unknown			X	9	3
4	Downstream headwall	Stone and concrete				8	2
5							
6							
7							
8							
9							
10							
11							
Calculated	2	**Worst**		**Override**	**3**		
Override Reason	Critical element has lower grading						

Comments	Outfall in good condition, very minor corrosion present on frame and flap valve. Unable to see through pipe and no CCTV footage available.
Recommendations	Conduct a CCTV survey to inspect pipe.

Asset ID	CL6	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Defence	**Asset Type - Subtype**	Wall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Crest	Stone				7	4
2	Landward Face	Stone				9	4
3	Exposed Face	Stone				9	4
4	Channel Side	Earth				5	3
5	Berm	Earth				5	3
6							
7							
8							
9							
10							
11							

Calculated	4	**Worst**		**Override**	
Override Reason					

Comments	Heavy foreign objects growing towards channel on berm and channel side and undermining on channel side causing channel side to be unstable. Ivy growth on wall, heavy foreign objects growing close to wall causing bulging to wall and capping stones lost from crest halfway across wall.
Recommendations	Rebuild wall, remove unstable trees and remove trees next to wall.

Asset ID	CL7	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Frame	Metal				7	2
2	Flap valve	Metal				9	2
3	Pipe	Unknown				9	2
4	Downstream headwall	Stone and concrete				8	3
5							
6							
7							
8							
9							
10							
11							

Calculated	2	**Worst**		**Override**	
Override Reason					
Comments	No signs of corrosion to flap valve or frame, pipe has minor leaf debris but no blockages or damage. Downstream headwall has some cracks, vegetation growth and mortar loss.				
Recommendations	Continue with ongoing vegetation maintenance.				

Asset ID	CL8	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Frame	Metal				7	2
2	Flap valve	Metal				9	2
3	Pipe	Unknown				9	2
4	Downstream headwall	Stone and concrete				8	3
5							
6							
7							
8							
9							
10							
11							

Calculated	2	**Worst**		**Override**	
Override Reason					
Comments	No signs of corrosion to flap valve or frame, pipe has minor leaf debris but no blockages or damage. Minor crack to downstream headwall, vegetation growth and mortar loss.				
Recommendations	Continue with ongoing vegetation maintenance.				

Asset ID	CL9	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Frame	Metal				7	3
2	Flap valve	Metal				9	2
3	Pipe	Unknown			X	9	2
4	Downstream headwall	Stone and concrete				8	3
5							
6							
7							
8							
9							
10							
11							

Calculated	2	**Worst**		**Override**	
Override Reason					

Comments	No corrosion to flap valve or frame. Cracks and mortar loss on headwall. Pipe has minor leaf debris but no blockages or damage.
Recommendations	Remove vegetation and continue with vegetation maintenance.

Asset ID	CL10	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Due**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Frame	Metal				7	3
2	Flap valve	Metal				9	2
3	Pipe	Unknown			X	9	2
4	Downstream headwall	Stone and concrete				8	3
5							
6							
7							
8							
9							
10							
11							
Calculated	2	**Worst**		**Override**			
Override Reason							

Comments	Ivy growth around frame and headwall. No corrosion to flap valve. Cracks and vegetation growth on headwall. Pipe has minor leaf debris but no blockages or damage.
Recommendations	Remove vegetation and continue with vegetation maintenance.

Asset ID	CL11	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Frame	Metal				7	3
2	Flap valve	Metal				9	2
3	Pipe	Unknown			X	9	2
4	Downstream headwall	Stone and concrete				8	3
5							
6							
7							
8							
9							
10							
11							

Calculated	2	**Worst**		**Override**			
Override Reason							
Comments	Ivy growth around frame and headwall. No corrosion to flap valve. Minor cracks and vegetation growth on headwall. Pipe has vegetation debris but no blockages or damage.						
Recommendations	Remove vegetation and continue with vegetation maintenance.						

Asset ID	CL12	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Frame	Metal				7	3
2	Flap valve	Metal				9	2
3	Pipe	Unknown			X	9	2
4	Downstream headwall	Stone and concrete				8	3
5							
6							
7							
8							
9							
10							
11							

Calculated	2	**Worst**		**Override**			
Override Reason							
Comments	No corrosion to flap valve or frame. Minor cracks, mortar loss and minor vegetation growth on headwall. Pipe has minor leaf debris but no blockages or damage.						
Recommendations	Remove vegetation and continue with vegetation maintenance.						

Asset ID	CL13	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Channel	**Asset Type - Subtype**	Natural High Ground				
Asset Location	Cleator						
Description	Near to Millers Walk, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	High ground	Tarmac				2	2
2	Channel Side	Earth				5	3
3							
4							
5							
6							
7							
8							
9							
10							
11							

Calculated	3	**Worst**		**Override**			
Override Reason							

Comments	Significant undermining, erosion and presence of light foreign objects on channel side. High ground in good condition.
Recommendations	Monitor erosion, consider installing erosion protection layer to channel side.

Asset ID	CL14	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Channel	**Asset Type - Subtype**	Natural High Ground				
Asset Location	Cleator						
Description	Near to Millers Walk, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	High ground	Tarmac				2	2
2	Channel Side	Earth				5	3
3							
4							
5							
6							
7							
8							
9							
10							
11							

Calculated	3	**Worst**		**Override**			
Override Reason							

Comments	Light foreign objects and ivy growing in front of and on top of channel side wall. High ground is road in good condition. Heavy foreign object upstream with roots growing into channel side brickwork.
Recommendations	Remove trees on top of and in front of channel side brickwork. Remove ivy.

Asset ID	CL15	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Defence	**Asset Type - Subtype**	Wall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				
Element Sequence	**Element Type**	**Material**	**Photo ref**	**Notes**	**ENI**	**Weighting**	**Condition**
1	Crest	Stone				7	3
2	Landward Face	Stone				9	3
3	Exposed Face	Stone				9	3
4	Channel Side	Earth				5	3
5	Berm	Earth				5	3
6							
7							
8							
9							
10							
11							
Calculated	3	**Worst**		**Override**			
Override Reason							
Comments	Several heavy foreign objects on berm and channel side. Severe mortar loss in landward face, exposed face difficult to inspect but wall covered in ivy and some tree roots and growing through it. Crest is unever where ivy has grown around it.						
Recommendations	Rebuild wall, remove ivy and remove trees growing into wall.						

Asset ID	CL16	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Defence	**Asset Type - Subtype**	Wall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				
Element Sequence	**Element Type**	**Material**	**Photo ref**	**Notes**	**ENI**	**Weighting**	**Condition**
1	Crest	Stone				7	4
2	Landward Face	Stone				9	2
3	Exposed Face	Stone				9	3
4	Channel Side	Earth				5	4
5							
6							
7							
8							
9							
10							
11							
Calculated	3	**Worst**		**Override**			
Override Reason							
Comments	Extensive ivy growth, channel side wall is walling down with severe brick loss and root penetration. Heavy foreign objects growing on channel side causing brick displacement and loss. Crest is uneven due to brick loss but landward face is made from concrete slabs in good condition.						
Recommendations	Rebuild wall and remove heavy foreign objects.						








Asset ID	CL17	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Channel	**Asset Type - Subtype**	Natural High Ground				
Asset Location	Cleator						
Description	Near to Millers Walk, Cleator						
Current Asset Condition	3	**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	High ground	Tarmac				2	2
2	Channel Side	Earth				5	3
3							
4							
5							
6							
7							
8							
9							
10							
11							
Calculated	3	**Worst**		**Override**			
Override Reason							

Comments	Heavy foreign objects on channel side leaning towards channel. Building <3m from channel on high ground.
Recommendations	Continue with vegetation maintenance and monitor tree growth.

Asset ID	CL18	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Defence	**Asset Type - Subtype**	Embankment				
Asset Location	Cleator						
Description	Near to Millers Walk, Cleator						
Current Asset Condition	4	**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Crest	Earth				9	3
2	Landward Face	Earth				9	3
3	Exposed Face	Earth				9	3
4	Channel Side	Earth				7	4
5							
6							
7							
8							
9							
10							
11							

Calculated	3	**Worst**		**Override**			
Override Reason							

Comments	Low points and rutting in crest but well vegetated. Variant used for exposed face due to steepness. Exposed and landward faces have isolated bare patches. Telegraph pole behind embankment but embankment build around it. Severe undermining of channel side around heavy foreign objects with extensive root exposure.
Recommendations	Remove unstable trees on channel side, infill low spots on crest and seed bare patches.









Asset ID	CL19	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Pipe	Unknown			X	9	3
2	Apron	Concrete				5	3
3	Downstream headwall	Stone and concrete				8	3
4							
5							
6							
7							
8							
9							
10							
11							

Calculated	3	**Worst**		**Override**	
Override Reason					

Comments	Drainage pipe halfway between wall and building on high ground. Unable to see through pipe and no CCTV footage available. Vegetation around headwall and at base of pipe.
Recommendations	Remove vegetation and provide ongoing vegetation maintenance. Conduct CCTV inspection of pipe.

Asset ID	CL20	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Hilden Road, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Pipe	Unknown			X	9	3
2	Downstream headwall	Stone and concrete				8	4
3							
4							
5							
6							
7							
8							
9							
10							
11							

Calculated	3	**Worst**		**Override**		
Override Reason						
Comments	Downstream headwall in pieces. Unable to see through pipe and no CCTV footage available.					
Recommendations	Rebuild headwall and conduct CCTV inspection of pipe.					

Asset ID	CL21	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Defence	**Asset Type - Subtype**	Embankment				
Asset Location	Cleator						
Description	Near to Millers Walk, Cleator						
Current Asset Condition	3	**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Crest	Earth				9	3
2	Landward Face	Earth				7	2
3	Exposed Face 1	Earth				7	2
4	Berm 1	Gabions				5	3
5	Exposed Face 2	Gabions				7	3
6	Berm 2	Concrete				5	2
7	Channel Side	Sheet piling				5	2
8							
9							
10							
11							

Calculated	2	**Worst**		**Override**	**3**		
Override Reason	Critical element has worse condition grade						
Comments	Berm 2 and channel side in good condition with minor cosmetic defects to sheet piles. Vegetation growth through gabion baskets with a few broken wires but no gabion displacement. Uneven ground on exposed face 1 and landward face but well vegetated. Rutting and low spots in isolated places on crest. Variants used on crest as less than 4m wide and landward face due to steepness.						
Recommendations	Remove vegetation in gabions and repair wires. Infill low spots on crest.						









Asset ID	CL22	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Defence	**Asset Type - Subtype**	Embankment				
Asset Location	Cleator						
Description	Between Mill Street and Brookside, Cleator						
Current Asset Condition	3	**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Crest	Earth				9	3
2	Landward Face	Earth				7	2
3	Exposed Face 1	Earth				7	2
4	Berm 1	Stone				5	3
5	Exposed Face 2	Stone				7	2
6	Berm 2	Concrete				5	2
7	Channel Side	Sheet piling				5	2
8	Landward face 2	Stone				7	2
9							
10							
11							
Calculated	2	**Worst**		**Override**	**3**		
Override Reason	Critical element has worse condition grade						

Comments	Minor vegetation growth within berm 1 and exposed face 2 with minor mortar loss. Uneven crest with some low spots but well vegetated. Berm 2 and channel side in good condition with minor cosmetic defects to sheet piling. Landward face and exposed face 1 are well vegetated but uneven. Landward face 2 around corner and has minor vegetation growing through stone and minor mortar loss.
Recommendations	Monitor vegetation growth in wall and infill low spots in crest.









Asset ID	CL23	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Structure	**Asset Type - Subtype**	Outfall				
Asset Location	Cleator						
Description	Between Mill Street and Brookside, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Downstream headwall	Stone and concrete			X	8	3
2	Pipe	Unknown			X	9	3
3	Barrier	Metal				2	3
4							
5							
6							
7							
8							
9							
10							
11							

Calculated	3	**Worst**		**Override**		
Override Reason						
Comments	Minor corrosion to barrier. Unable to see headwall and pipe due to high water level and barrier around.					
Recommendations	Conduct CCTV inspection for pipe and headwall.					

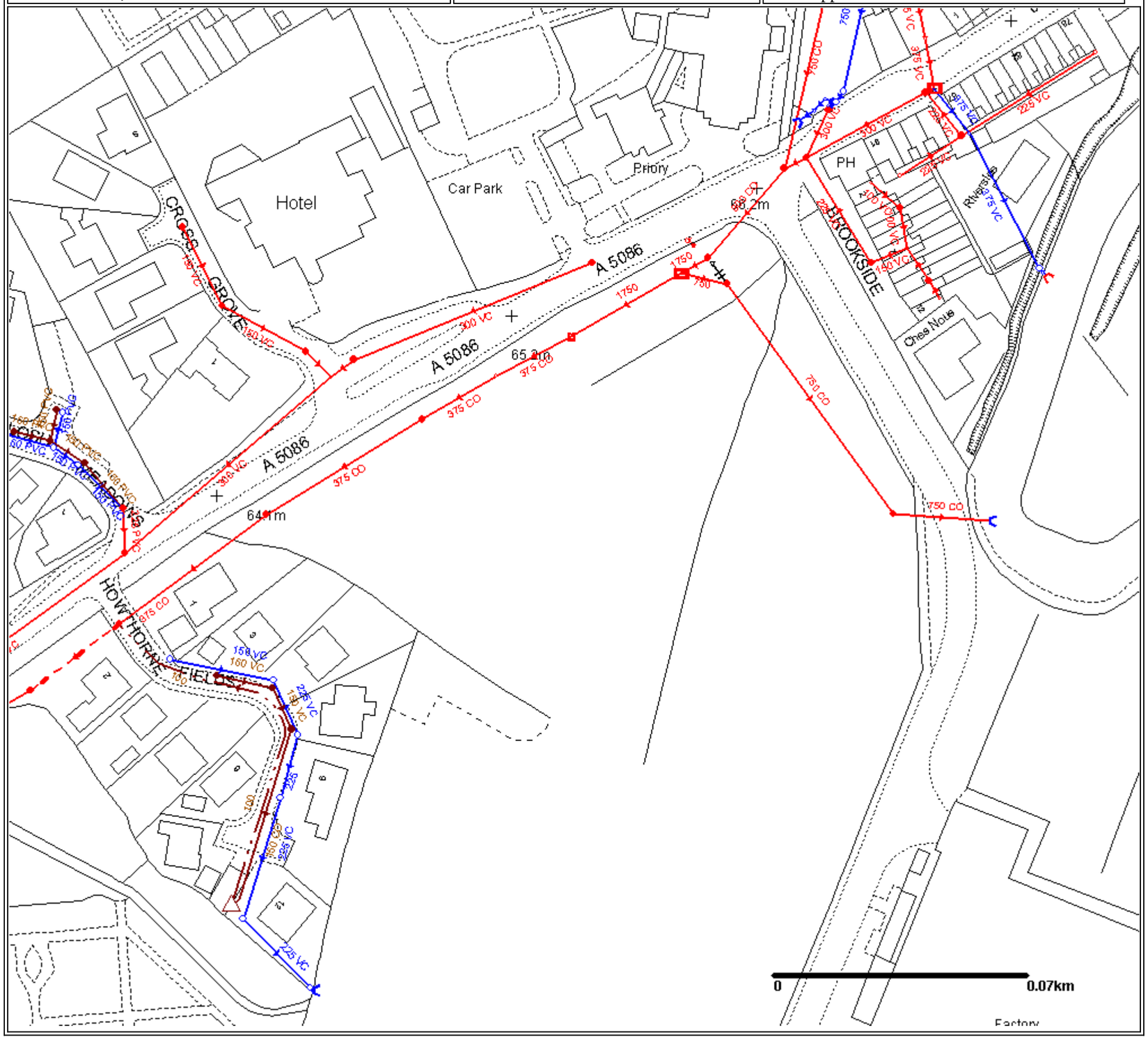
Asset ID	CL24	**Frequency**					
Latest Assessment Date	28/01/2022	**Due Date**					
Asset Inspector	Alexandra Mackaness						
Asset Name	Defence	**Asset Type - Subtype**	Wall				
Asset Location	Cleator						
Description	Brookside, Cleator						
Current Asset Condition		**Target condition**	3				

Element Sequence	Element Type	Material	Photo ref	Notes	ENI	Weighting	Condition
1	Crest	Stone				7	3
2	Landward Face	Stone				9	3
3	Exposed Face	Stone				9	3
4							
5							
6							
7							
8							
9							
10							
11							
Calculated	3	**Worst**		**Override**			
Override Reason							

Comments	Minor vegetation growth through crest. Minor mortar loss on exposed face and a couple of holes on both faces, not whole way though. Few bricks missing for drainage.
Recommendations	Repair holes in wall and remove vegetation.

APPENDIX H: UNITED UTILITIES GIS

Centre: 302002,513969	Date:08-07-2013	Scale Approx 1: 1249



ATKINS CHECKED

MK

Extract from Map from Public Sewers

The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best informatin currently available.

The actual postions may be different from those shown on the plan and private pipes, sewers or drains are not recorded.

United Utilities will not accept any liability for any damage caused by the actual positions being different from those shown.

Red or Brown - Foul Sewers
Blue - Surface Water Sewers

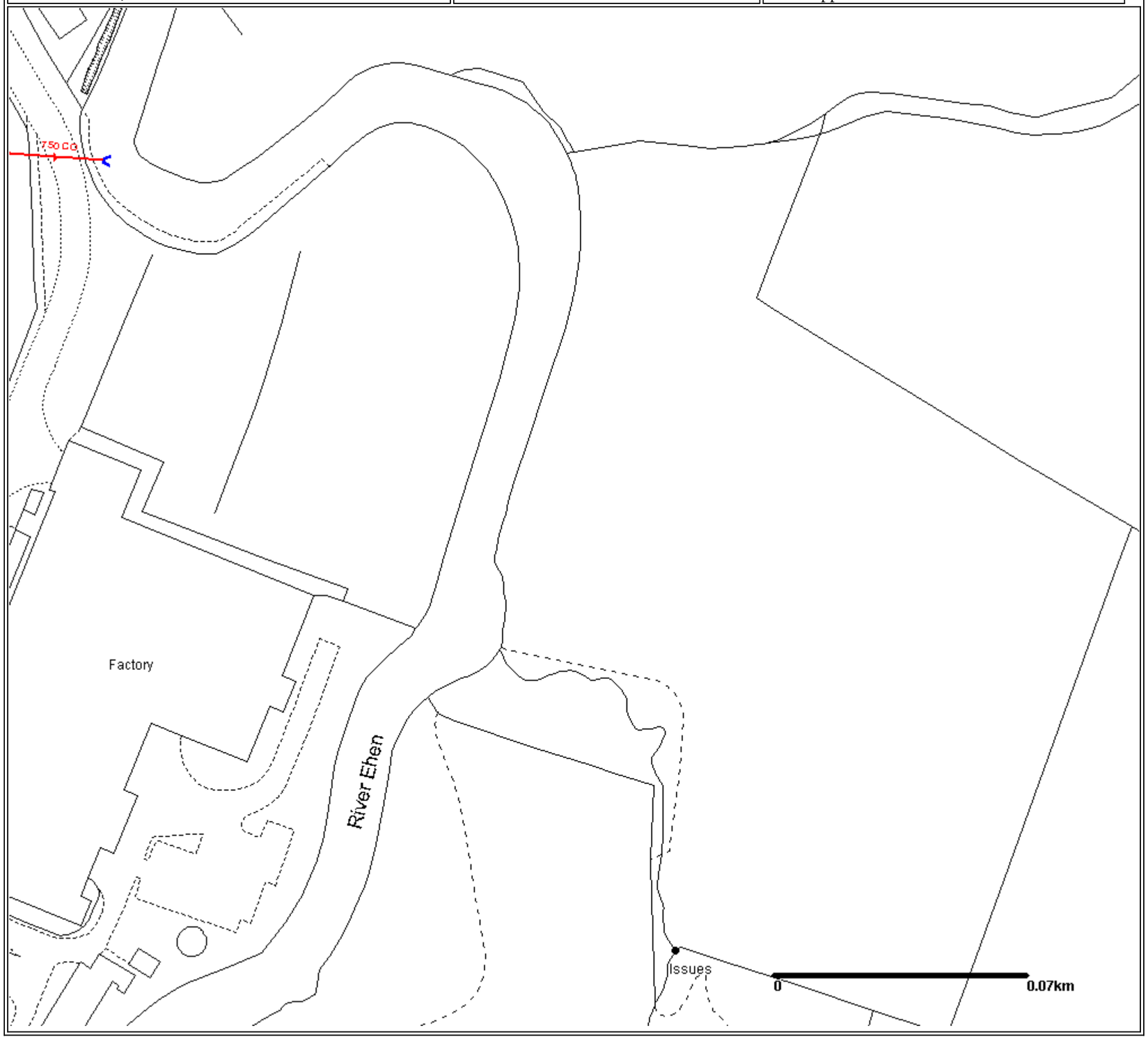
——— **Public Sewer**
– – – – **Highway Drain**
— — — **Private Sewer**
— — — **Pumping Main**

DO NOT SCALE

Approximate Scale 1: 1249

United Utilities

Centre: 302247,513869	Date:08-07-2013	Scale Approx 1: 1249



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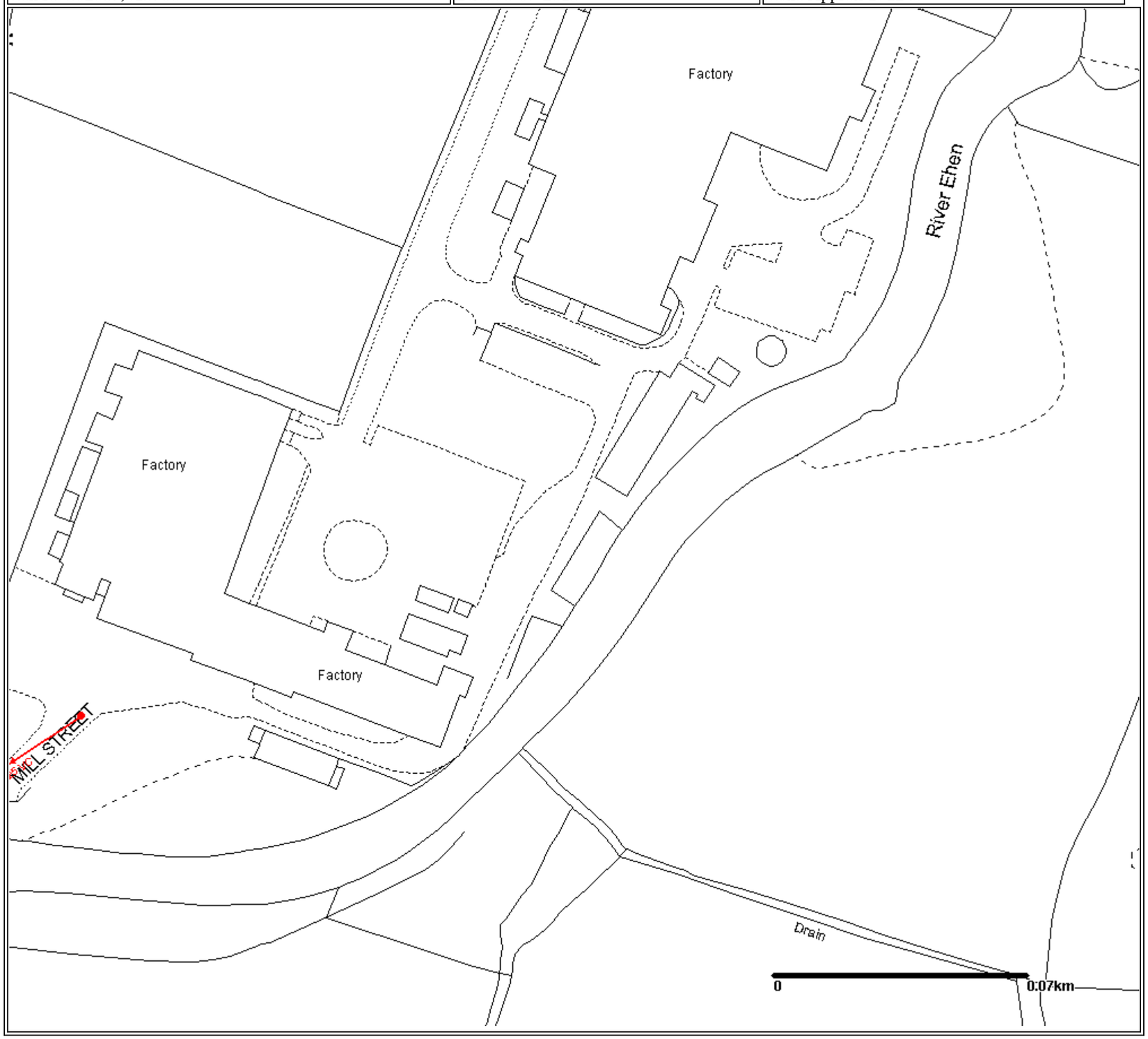
Red or Brown - Foul Sewers
Blue - Surface Water Sewers

——— Public Sewer
– – – – – Highway Drain
— — — — Private Sewer
— — — — Pumping Main

DO NOT SCALE

Approximate Scale 1: 1249

Centre: 302087,513706	Date:08-07-2013	Scale Approx 1: 1249



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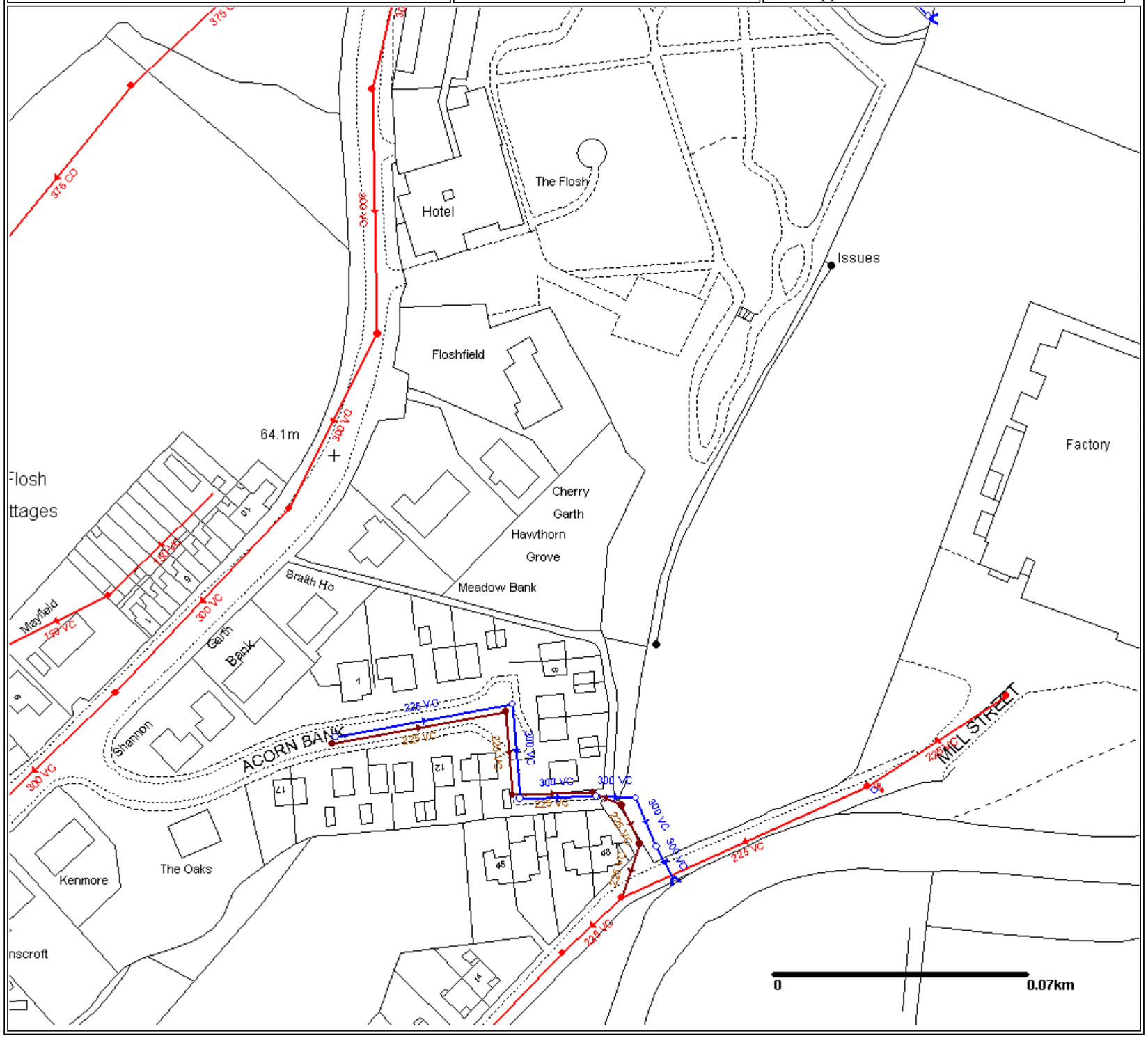
Red or Brown - Foul Sewers
Blue - Surface Water Sewers

——— Public Sewer
– – – – – Highway Drain
— — — – Private Sewer
— — — — Pumping Main

DO NOT SCALE

Approximate Scale 1: 1249

Centre: 301832,513701	Date:08-07-2013	Scale Approx 1: 1249



Extract from Map from Public Sewers

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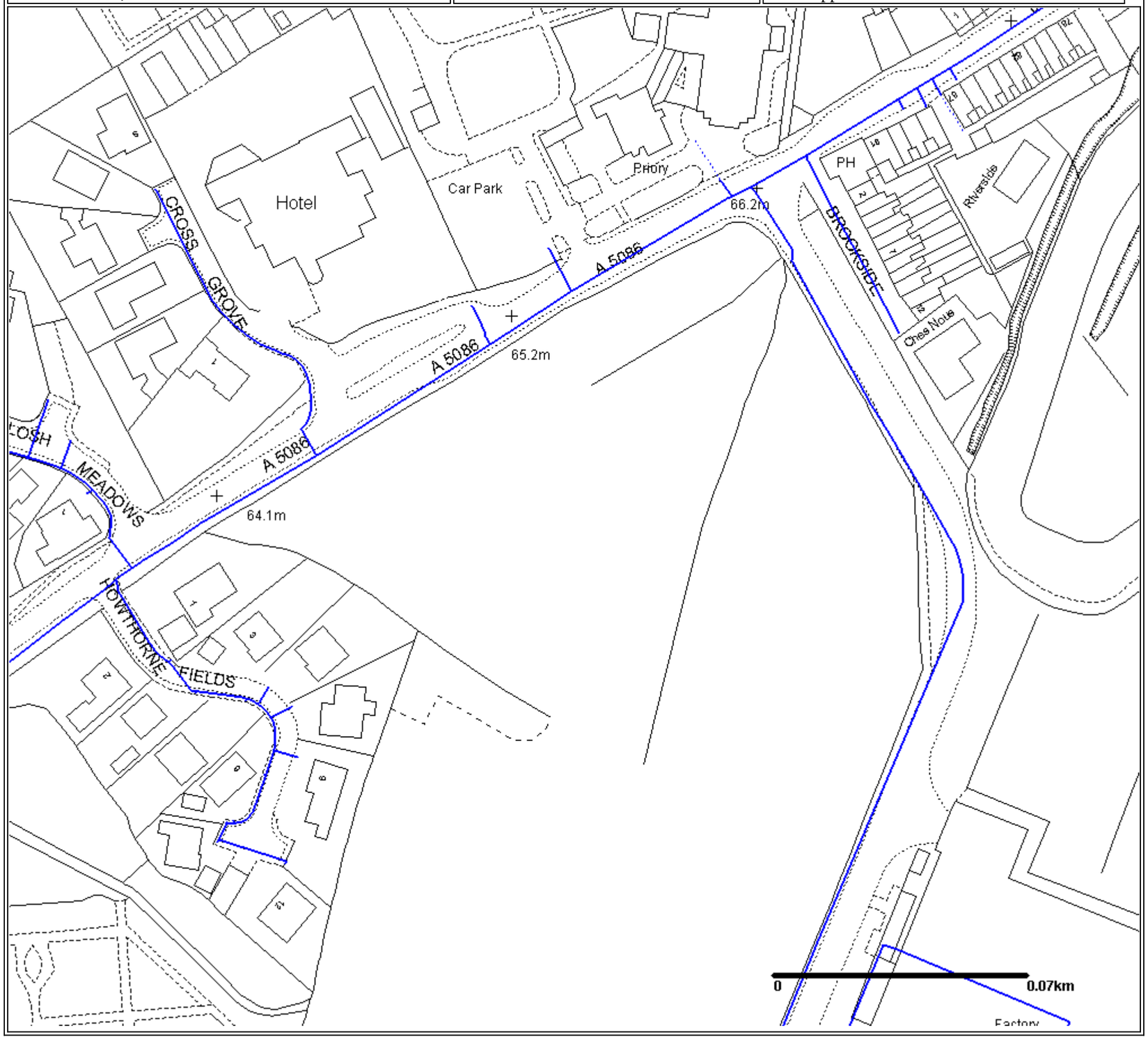
Red or Brown - Foul Sewers
Blue - Surface Water Sewers

——— **Public Sewer**
– – – – – **Highway Drain**
— — — — **Private Sewer**
— — — — **Pumping Main**

DO NOT SCALE

Approximate Scale 1: 1249

Centre: 302002,513969	Date:08-07-2013	Scale Approx 1: 1249



ATKINS CHECKED
MK

Extract from Map of Public Water Mains

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Blue - Distribution Mains
Red or Mauve - Trunk Mains
Dark Green - Non Potable Mains

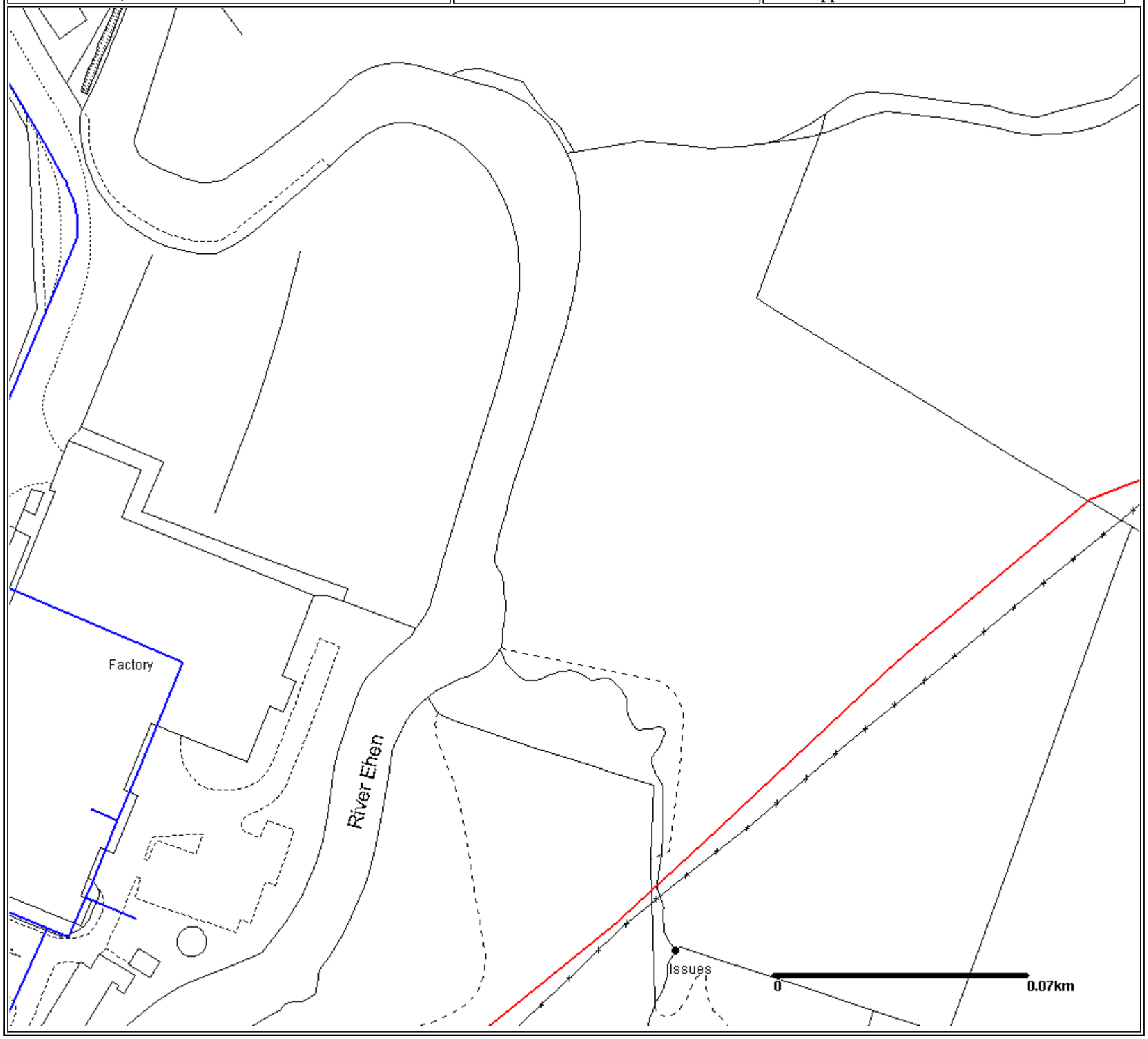
---x---x---x---x--- Disused Mains
(These may still be live!)

DO NOT SCALE

Approximate Scale 1: 1249

United Utilities

Centre: 302247,513869	Date:08-07-2013	Scale Approx 1: 1249



Extract from Map of Public Water Mains

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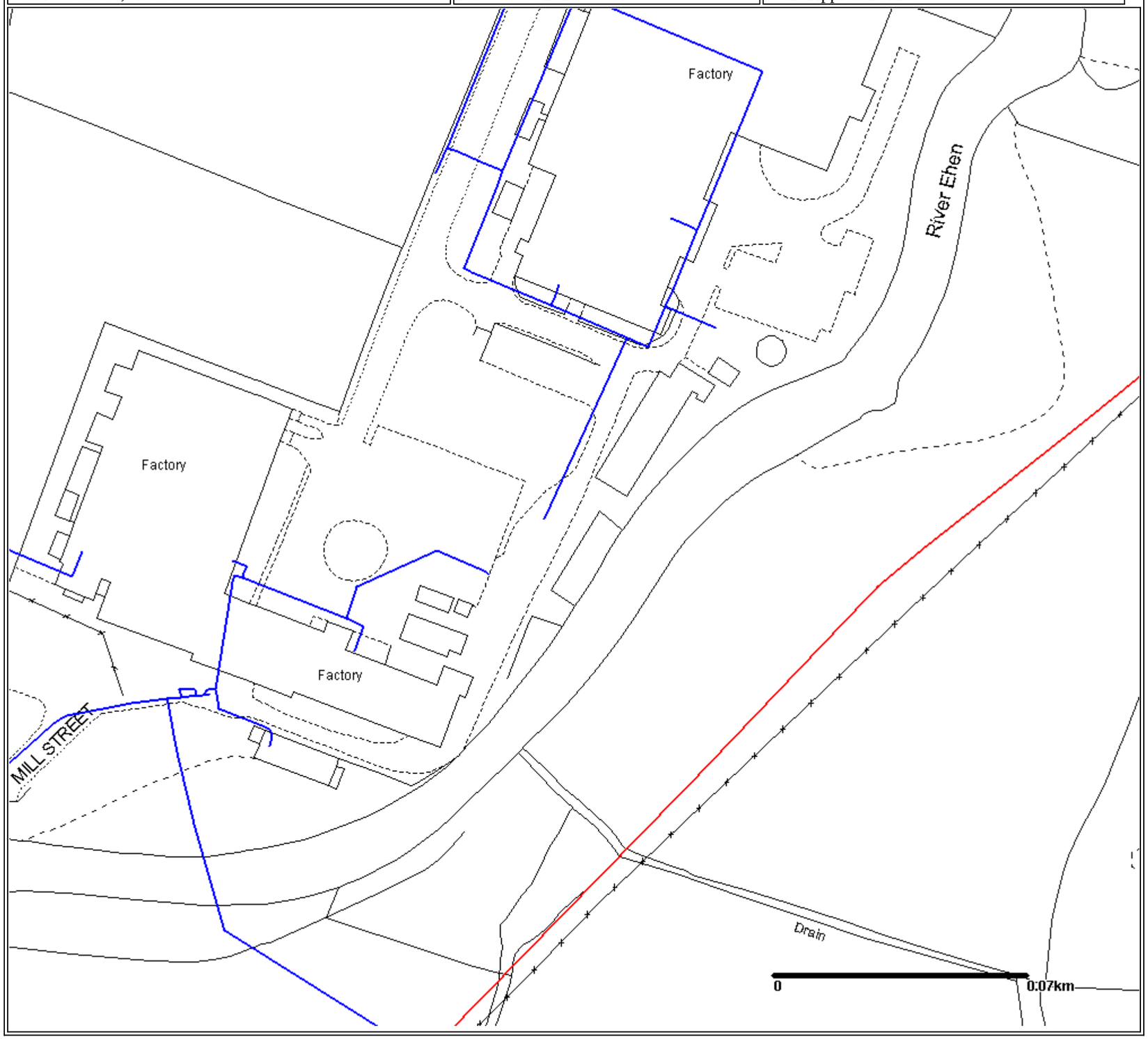
Red or Mauve - Trunk Mains
Dark Green - Non Potable Mains

---x---x---x---x--- Disused Mains
(These may still be live!)

DO NOT SCALE

Approximate Scale 1: 1249

Centre: 302087,513706	Date:08-07-2013	Scale Approx 1: 1249



Extract from Map of Public Water Mains

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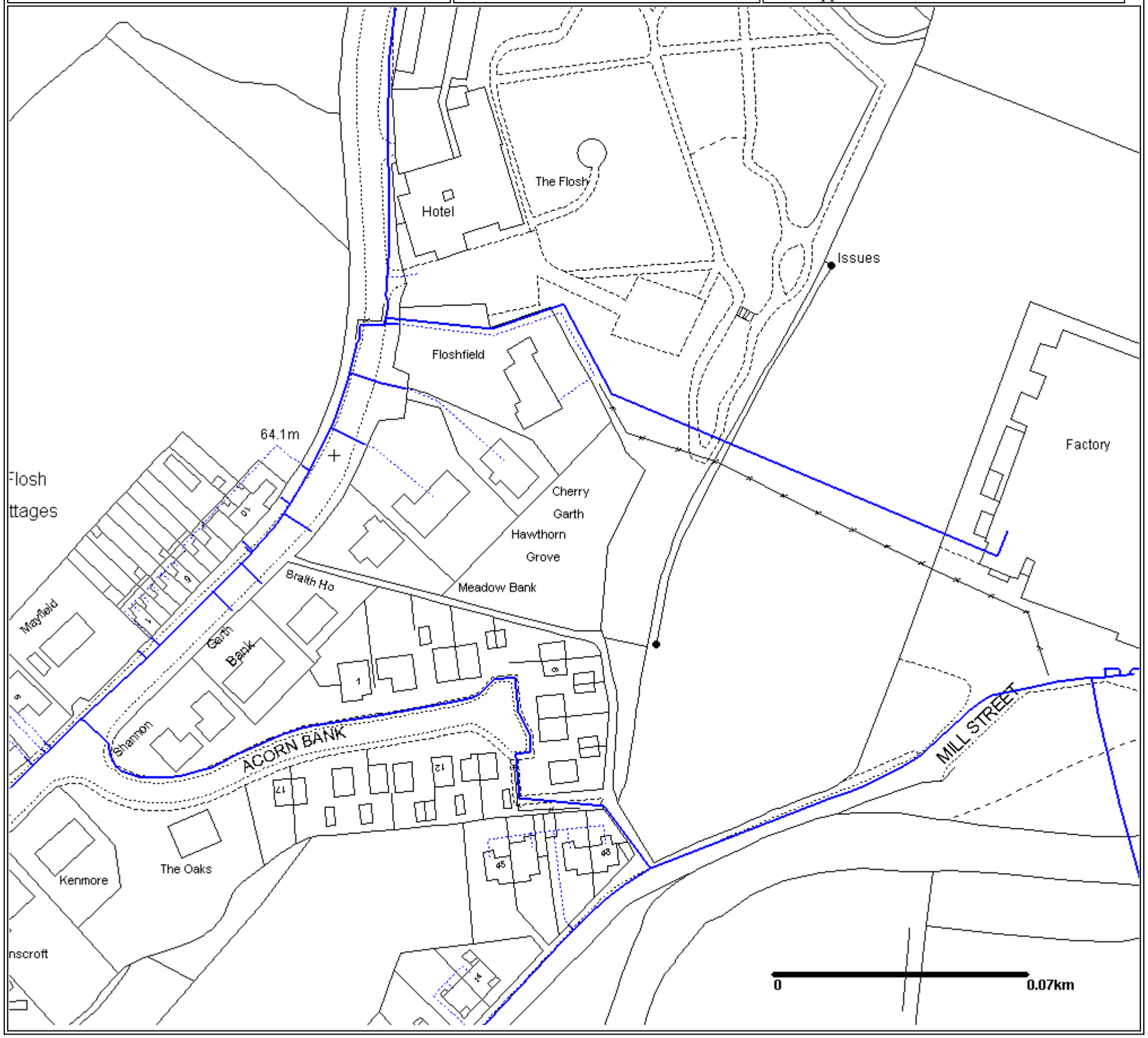
Red or Mauve - Trunk Mains
Dark Green - Non Potable Mains

---x---x---x---x--- Disused Mains
(These may still be live!)

DO NOT SCALE

Approximate Scale 1: 1249

Centre: 301832,513701	Date:08-07-2013	Scale Approx 1: 1249



Extract from Map of Public Water Mains

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Red or Mauve - Trunk Mains
Dark Green - Non Potable Mains

---x---x---x---x--- Disused Mains
(These may still be live!)

DO NOT SCALE

Approximate Scale 1: 1249

RWO

Civil
Structures
Geoenvironmental

ISO 9001:2015 Quality Management

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