Renwick

Flood Investigation Report No 61

Flood Event 28th June 2012
And
18th May 2013

This flood investigation report has been produced by Cumbria County Council as a Lead Local Flood Authority under Section 19 of the Flood and Water Management Act 2010.

Version	Undertaken by	Reviewed by	Approved by	Date
Preliminary	Helen Renyard/ David White	Anthony Lane		18th Sept 2013
Draft	Helen Renyard	Anthony Lane		19th Sept 2013
Published	Helen Renyard	Anthony Lane	Doug Coyle	30th March 2014

Contents

Executive Summary

Cumbria County Council (CCC) as Lead Local Flood Authority has prepared this report with the assistance of other Flood Risk Management Authorities as it considers necessary to do so under Section 19 of the Flood and Water Management Act 2010.

Renwick has been affected by four significant events, 28th June 2012, 17 to 18th May 2013, 23th July 2013 and 28th July 2013. The only event to cause internal flooding was the 28th June 2012 where 9 properties were affected. The cause of the flooding for all events was excessive rainfall. Specifically on the 28th June soil erosion and debris severely compromised the gratings on the watercourse at the entrance to the main culvert into the village.

The report recommends various actions including on-going maintenance of drainage systems including gullies, development of a community plan and possible options to reduce the risk of flooding if funding can be obtained.

Event Background

This section considers the location of the flood incidents, weather conditions at the time of the flooding events and condition of any drainage systems in the area.

Flooding Incident

Renwick is a small village of approximately 50 properties that lies in the foothills of the Pennines. The majority of the buildings are located along the main street through the village. Renwick is located approximately 16km northeast of Penrith.

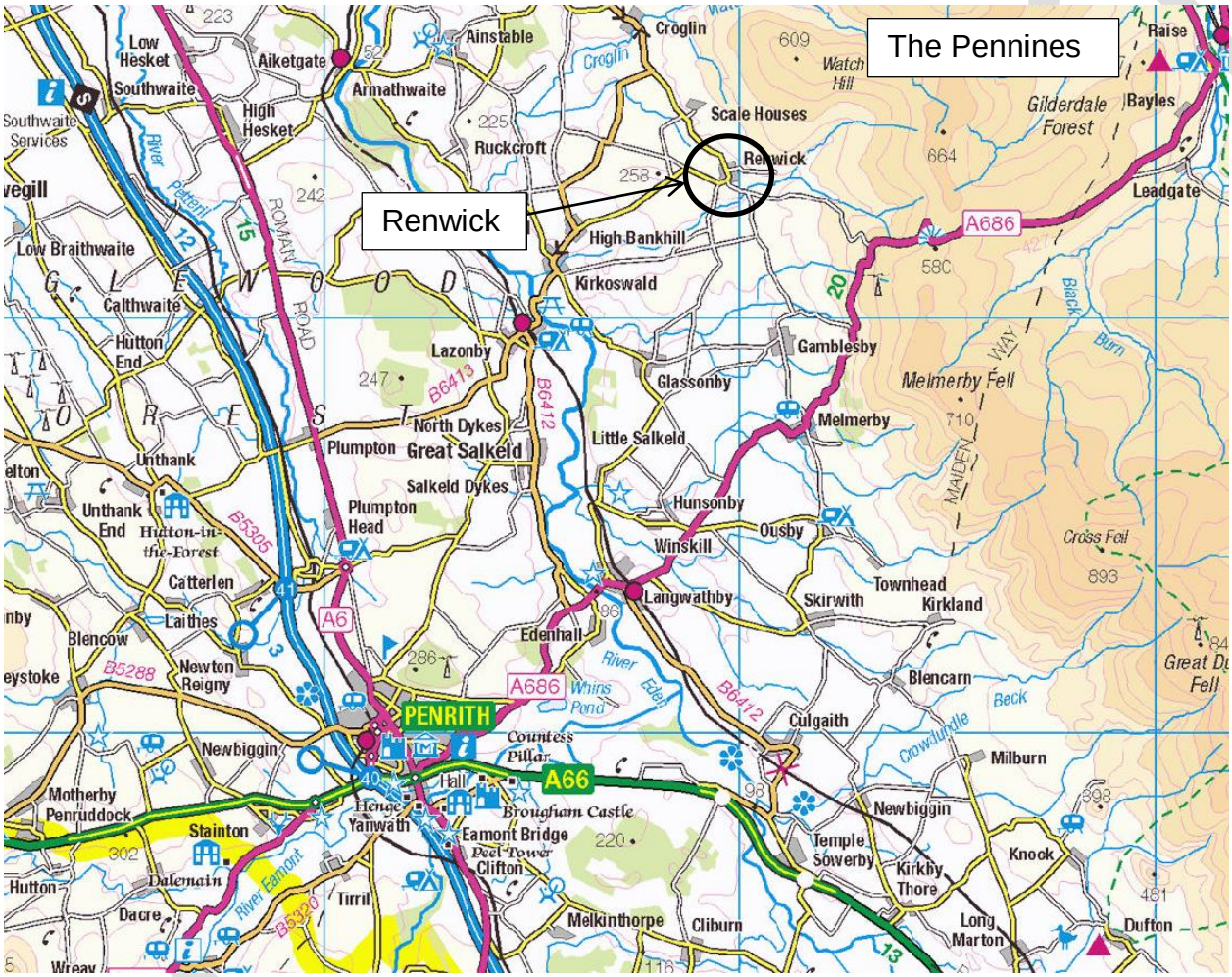


Figure 1: Location Plan.

Renwick was affected by four heavy rainfall events, 28th June 2012, 17 to 18th May 2013, 24th July 2013 and 28th July 2013. The event in June 2012 was known to cause the most damage of the four events and caused internal flooding to 9no properties. The flooded properties are indicated on the plan in figure 4.

Investigation

The investigation carried out by CCC includes a collection of data from various sources including MSFW partners, Environment Agency (EA), United Utilities (UU), Eden District Council (EDC) and CCC Highways. Also included is feedback from residents who had experienced flooding.

Rainfall Event

Rainfall data can be obtained from EA rain gauges that are located throughout Cumbria. However, during rainfall events these may not be located at the exact location of the event. The nearest rain gauge to Renwick is located at Haresceugh Castle which is approximately 1.3km from Renwick.

- On 28th June 2012 a total of 44.2mm of rainfall was recorded.
- During the 17th to 18th May 2013 event saw 25 and 29mm of rain fell on successive days.

The rainfall total recorded at Haresceugh Castle for June 2012 was 237% of the long term average and for May 2013 was 178% of the long term average. The long term averages used are provided by the Met office and are calculated using their 1961-1990 datasets. The following hyetographs show the pattern of rainfall for the four events.

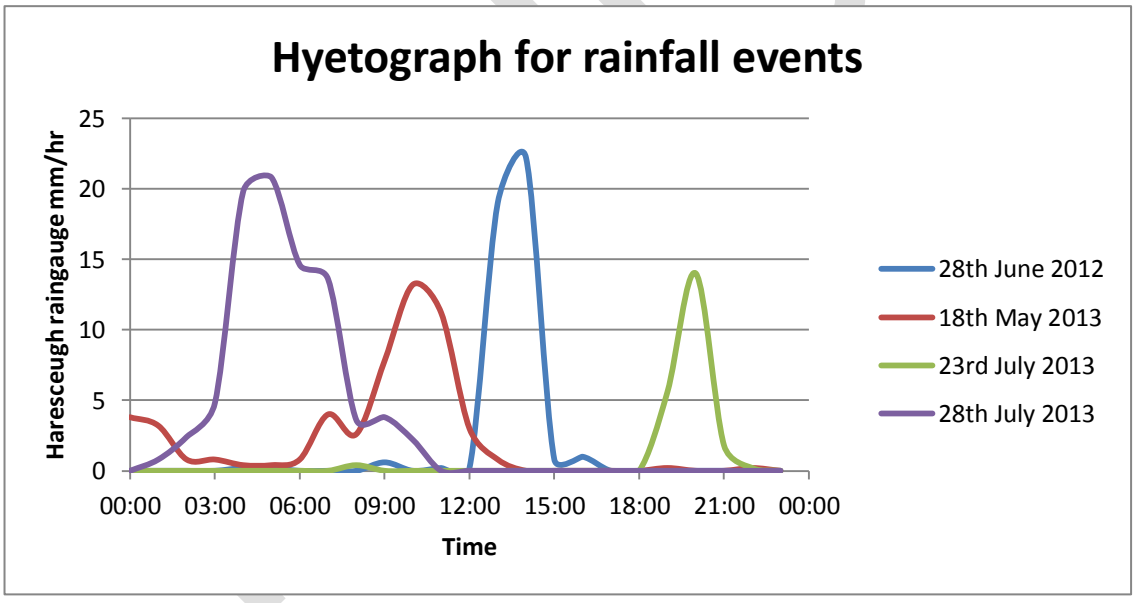


Figure 2: Rainfall hyetograph

Contains Environment Agency information © Environment Agency and database right

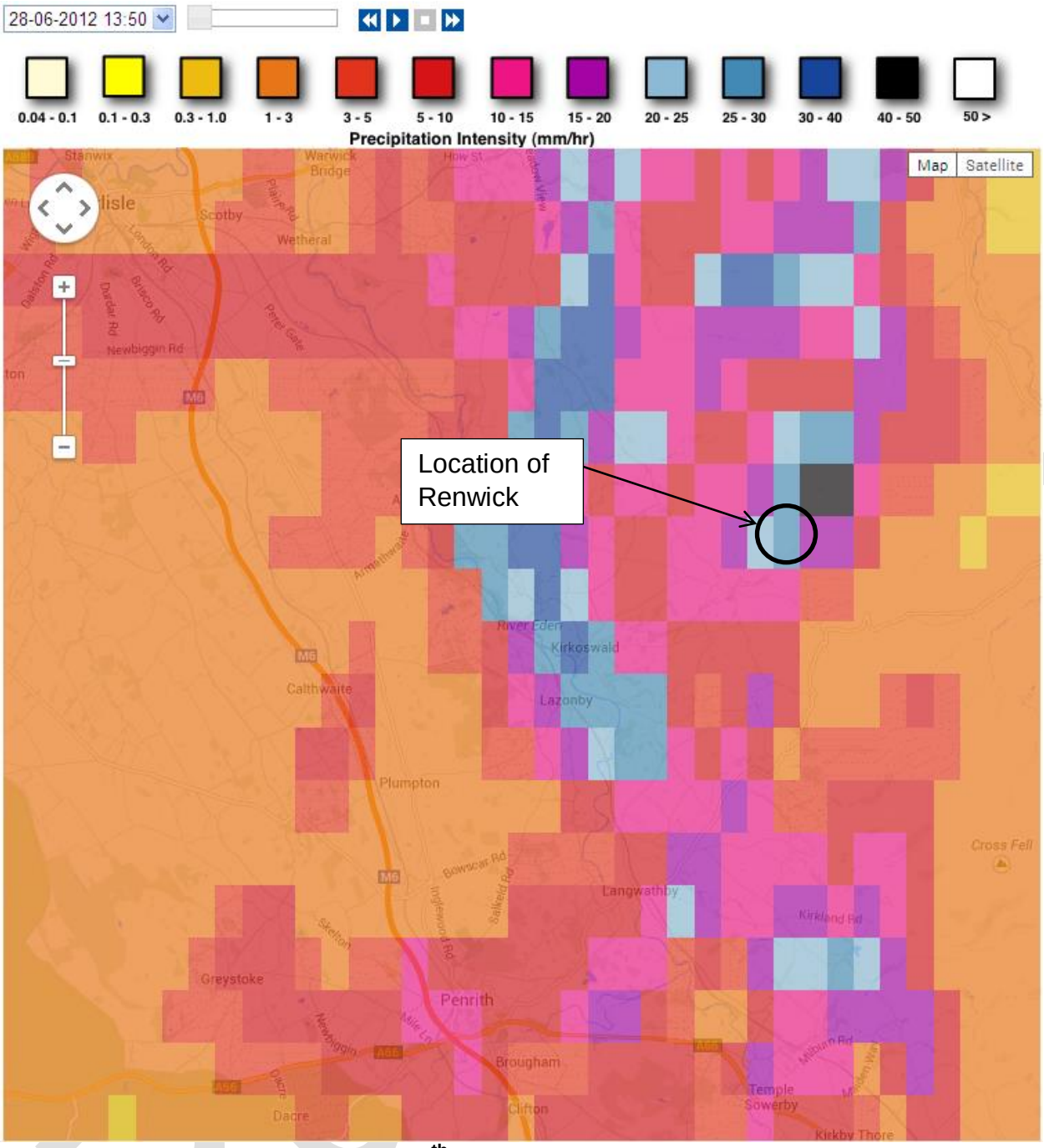


Figure 3: Radar information for 28th June 2012 indicating peak intensities of 40mm+

Map of Flow Routes

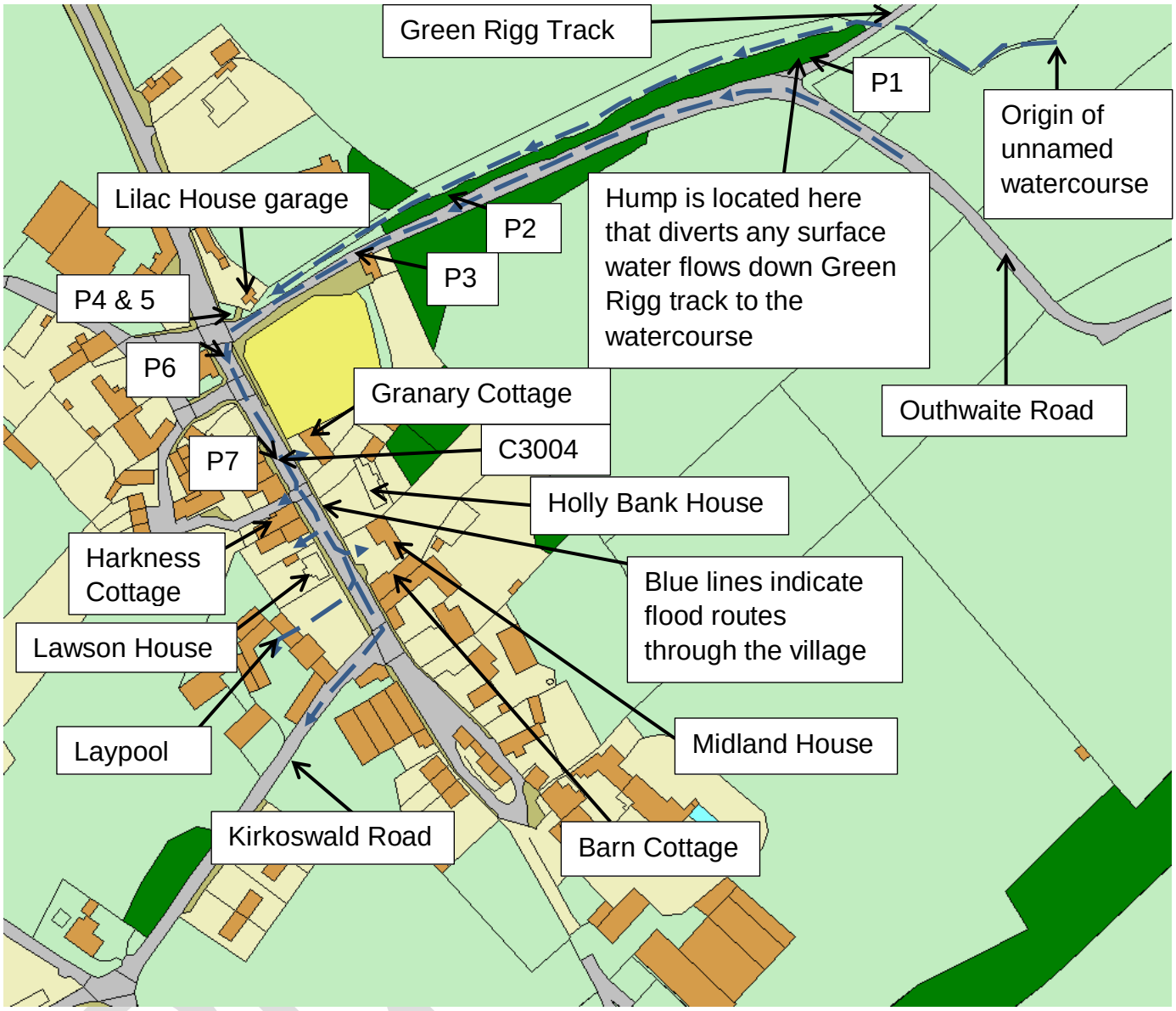


Figure 4: Plan indicating flow routes through Renwick and location of photographs

Likely Causes of Flooding

The unnamed watercourse to the north of the village was the main source of flooding on 28th June 2012. The water course issues close to the track from Green Rigg. Other surface water flows contributed to the already heavy flows in the watercourse from the Green Rigg track and road surface water coming from the Outhwaite direction.

Flows from the Green Rigg track are diverted into the beck in an uncontrolled manner which contributed to the significant damage to the watercourse embankments illustrated in photograph 1. The embankment slippage added to the mud and debris already within the watercourse causing significant blockages on the open slabbed watercourse clogging grills above and prior to the culverted section close to Lilac House.

Photograph 1: Landslip near the junction of Green Rigg track and Ormthwaite Road

Photograph 2: Grill in watercourse to capture leaves and debris

Grills as shown in photograph 2 have been installed along the watercourse to capture leaves and debris to try to prevent blockages in the culverted section through the village. However, during the events detailed, these grills become overwhelmed. Photograph 3 shows the actual flows experienced on 28th June 2012 and photograph 4 shows the watercourse channel in normal conditions.

Photograph 3: Flow on 28th June 2012 overwhelming culvert entrance

Photograph 4: Watercourse channel in normal circumstances parallel to Outhwaite Road

The following photograph taken after the channel was cleaned out shows the damage caused by the event on 28th June 2012 and highlights the damage caused by the force of the water.

Photograph 5: Damage to culvert entrance following 28th June 2012 event

Once the watercourse reaches the village it enters the culvert shown in photograph 5. In normal circumstances the flow enters a 300mm diameter culvert which runs along the main road, turning at approximately 90 degrees into Kirkoswald Road. The culvert flows down Kirkoswald Road and discharges into Harberry Beck.

From the culvert headwall a second 225mm diameter pipe acts as an 'overflow' pipe. The 'overflow' pipe runs for approximately 43m where it discharges into a 450 x 600mm stone/concrete culvert. It is understood that this was the original route of the old watercourse. The 'overflow' continues in the 450 x 600mm stone/concrete culvert where it runs under buildings before discharging into an open channel on the East side of the village as shown on the plan in figure 5. It is likely that the new 300mm culvert was installed as a diversion to the original stone/concrete culvert.

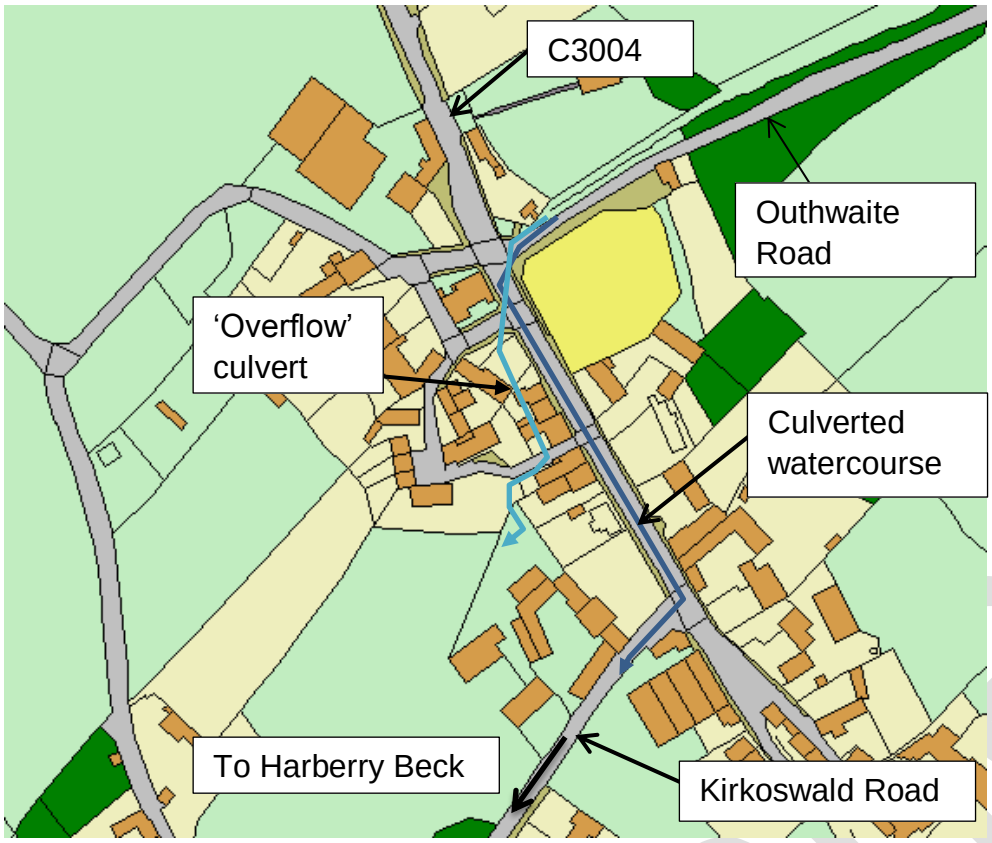


Figure 5: Route of culverted watercourse and 'overflow' through the village

Highways arranged for a survey of the boxed culvert section of the 'overflow' route. Due to the condition of the culvert it was not possible to survey the full extent of the boxed culverted section. On the length that the survey was possible issues were identified on the culvert that could cause snagging of debris that could result in blockages. The survey report also identified that pipework leading into the brick/concrete culvert were holding heavy amounts of debris. This was likely to have been deposited during the June 2012 event.

In 1873 the Penrith Rural Sanitary Committee proposed works to attempt to alleviate issues with disease which included improvements to the banks and bed of the watercourse that ran through the village so that it could continue to be used as a 'sewer'. It is difficult from the information provided to identify the exact course of this but from the information it would appear that it is possibly the original watercourse that is now classed as the 'overflow' culvert. A public sewer is now available in the village but does not use this route. The information has been forwarded to United Utilities to consider the status of the watercourse. United Utilities have confirmed that they do not consider the 'overflow' culvert to be a public sewer. Details of the correspondence are provided in Appendix 5. Therefore, it is considered that each riparian land owner is responsible for maintenance of the section of watercourse through their land.

Photograph 6 indicates the volumes of water that was not able to enter the main culvert into the village and proceeded through the middle of the village via the main road.

Photograph 6: Surface water flows on C3004 on 28th June 2012

Flood water flowed down the main road towards Kirkoswald Road topping over dropped kerbs provided at access points to drive ways into properties. This in turn led to internal flooding of the 9 properties as indicated previously in figure 3.

Flood water overwhelmed the existing gullies, which were also blocked by mud and debris. Photograph 7 indicates the extent of flooding on the main road.

Photograph 7: Area where surface water collected causing flooding

CCC has not received any reports of foul sewer flooding.

Flooding History

Discussions with residents in Renwick have suggested that prior to the flooding on 28th June 2012 that it was understood that flooding to a similar extent had not happened for approximately 40 years ago. However, there was no further information on the extent of the flooding.

Recommended Actions

Action by	Recommended Action	How
CCC Highways	Clear debris from highway and ensure gully pots and connecting pipework are clean	Use excavators and street sweepers to clean debris from the highway – COMPLETED Use jetting equipment to clear silt and debris from gully pots and connecting pipework - COMPLETED
CCC Highways	Maintain gully pots and pipework of highway gullies	Continue to maintain gully cleaning schedules. ONGOING
Riparian Owners	Establish who owns the watercourse as it enters the village	LFRM ordered Land Registry search. COMPLETED but no details on ownership.
Riparian Owners with 'overflow system' (original watercourse) running through their land	Ensure the watercourse running through their land is running freely as required.	Work with CCC to identify blockages and arrange suitable repairs.
CCC LFRM	CCTV survey of culvert and associated connections	Use survey cameras to obtain information on the condition of the culvert. Partially completed 26th/27th February 2014 and 28th March 2014. ONGOING
CCC LFRM	Consider options to prevent future flooding including the possibility of Property Level Protection.	CCC LRFM to review possible options and where appropriate apply for FDGiA funding. Next FDGiA submission date is March 2014.
Residents	Continue to report flooding issues to the relevant authorities	Use contact details in Appendix 4 to report any future flooding
Community	Develop Community Action Plan	Follow 10 steps plan approach with the assistance of CCC.

Residents and property owners who are aware that they are at risk of flooding should take action to ensure that they and their properties are protected. Community resilience is important in providing information and support to each other if flooding is anticipated. Actions taken can include laying sandbags and moving valuable items to higher ground, to more permanent measures such as installing floodgates, raising electrical sockets and fitting non-return valves on pipes. Anyone affected by flooding should try to document as much information about the incident as possible.

Next Steps

CCC as the LLFA will continue to ensure that any actions identified within the actions table of this report are appropriately taken forward by each Risk Management Authority identified. Actions will continue to be prioritised through the Making Space for Water process and monitored through regular meetings of the group. Details of the MSfWG members and summary of related processes are detailed in Appendix 2.

Appendices

Appendix 1: Glossary

Acronyms

EA	Environment Agency
CCC	Cumbria County Council
UU	United Utilities
LLFA	Lead Local Flood Authority
LFRM	Local Flood Risk Management
MSfWG	Making Space for Water Group
FAG	Flood Action Group
FWMA	Flood and Water Management Act 2010
LDA	Land Drainage Act 1991
WRA	Water Resources Act 1991

Appendix 2: Summary of Relevant Legislation and Flood Risk Management Authorities

The Flood Risk Regulations 1999 and the Flood and Water Management Act 2010 (the Act) have established Cumbria County Council (CCC) as the Lead Local Flood Authority (LLFA) for Cumbria. This has placed various responsibilities on CCC including Section 19 of the Act which states:

Section 19

(1) On becoming aware of a flood in its area, a lead local flood authority must, to the extent that it considers it necessary or appropriate, investigate—

(a) which risk management authorities have relevant flood risk management functions, and

(b) whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.

(2) Where an authority carries out an investigation under subsection (1) it must—

(a) publish the results of its investigation, and

(b) notify any relevant risk management authorities.

A '*Risk Management Authority' (RMA)* means:

(a) the Environment Agency,

(b) a lead local flood authority,

(c) a district council for an area for which there is no unitary authority,

(d) an internal drainage board,

(e) a water company, and

(f) a highway authority.

The table below summarises the relevant Risk Management Authority and details the various local source of flooding that they will take a lead on.

Flood Source	Environment Agency	Lead Local Flood Authority	District Council	Water Company	Highway Authority
RIVERS					
Main river					
Ordinary watercourse					
SURFACE RUNOFF					
Surface water					
Surface water on the highway					
OTHER					
Sewer flooding					
The sea					
Groundwater					
Reservoirs					

The following information provides a summary of each Risk Management Authority's roles and responsibilities in relation to flood reporting and investigation.

Government – Defra develop national policies to form the basis of the Environment Agency's and Cumbria County Council's work relating to flood risk.

Environment Agency has a strategic overview of all sources of flooding and coastal erosion as defined in the Act. As part of its role concerning flood investigations this requires providing evidence and advice to support other risk management authorities. The EA also collates and reviews assessments, maps and plans for local flood risk management (normally undertaken by LLFA).

Lead Local Flood Authorities (LLFAs) – Cumbria County Council is the LLFA for Cumbria. Part of their role requires them to investigate significant local flooding incidents and publish the results of such investigations. LLFAs have a duty to determine which risk management authority has relevant powers to investigate flood incidents to help understand how they happened, and whether those authorities have or intend to exercise their powers. LLFAs work in partnership with communities and flood risk management authorities to maximise knowledge of flood risk to all involved. This function is carried out at CCC by the Local Flood Risk Management Team.

District and Borough Councils – These organisations perform a significant amount of work relating to flood risk management including providing advice to communities and gathering information on flooding.

Water and Sewerage Companies manage the risk of flooding to water supply and sewerage facilities and the risk to others from the failure of their infrastructure. They make sure their systems have the appropriate level of resilience to flooding and where frequent and severe flooding occurs they are required to address this through their capital investment plans. It should also be noted that following the Transfer of Private Sewers Regulations 2011 water and sewerage companies are responsible for a larger number of sewers than prior to the regulation.

Highway Authorities have the lead responsibility for providing and managing highway drainage and certain roadside ditches that they have created under the Highways Act 1980. The owners of land adjoining a highway also have a common-law duty to maintain ditches to prevent them causing a nuisance to road users.

Flood risk in Cumbria is managed through the Making Space for Water process which involves the cooperation and regular meeting of the Environment Agency, United Utilities, District/Borough Councils and CCC's Highway and LFRM Teams to develop processes and schemes to minimise flood risk. The MSfWGs meet approximately 4 times per year to cooperate and work together to improve the flood risk in the vulnerable areas identified in this report by completing the recommended actions. CCC as LLFA has a responsibility to oversee the delivery of these actions.

Where minor works or quick win schemes can be identified, these will be prioritised and subject to available funding and resources will be carried out as soon as possible. Any major works requiring capital investment will be considered through the Environment Agency's Medium Term Plan or a partners own capital investment process.

Appendix 3: Useful contacts and links

Cumbria County Council (Local Flood Risk Management):
lfrm@cumbria.gov.uk, www.cumbria.gov.uk, tel: 01228 221330

Cumbria County Council (Highways):
highways@cumbria.gov.uk, www.cumbria.gov.uk, tel: 0845 609 6609
Out of hours emergencies should be reported via the Police on 101

Cumbria County Council (Neighbourhood forum):
Jeff.tweddle@cumbria.gov.uk, www.cumbria.gov.uk, tel: 01768 812661

United Utilities: www.unitedutilities.com, tel: 0845 746 2200

Eden District Council:
www.eden.gov.uk, tel: 01768 817817

Environment Agency:
www.environment-agency.gov.uk, tel: 03708 506 506

Flood and Water Management Act 2010:
http://www.legislation.gov.uk/ukpga/2010/29/contents

Water Resources Act 1991:
http://www.legislation.gov.uk/all?title=water%20resources%20act

Land Drainage Act:
http://www.legislation.gov.uk/all?title=land%20drainage%20act

Highways Act 1980:
http://www.legislation.gov.uk/all?title=highways%20act

EA – 'Living on the Edge' a guide to the rights and responsibilities of riverside occupation:
http://www.environment-agency.gov.uk/homeandleisure/floods/31626.aspx

EA – 'Prepare your property for flooding' how to reduce flood damage including flood protection products and services:
http://www.environment-agency.gov.uk/homeandleisure/floods/31644.aspx

Appendix 4: Summary of feedback to draft report

The following information has been received either at the Flood Forum held on 19th September 2013 or forwarded after from various members of the community which can include residents, the Parish Council and members of the MSFW group.

- Request for more improved cleaning of the watercourse, culvert and gullies
- Location of old village water tank
- Problems with debris in grills upstream of village
- Information on old drainage system / 'village' drain which runs under properties – archive location of details
- Locations of possible flow routes to prevent flooding
- Information on the extent of road flooding at the Harberry Beck culvert below the school
- Observations of water surcharging from gully opposite school
- Information that the culvert from the school to Harberry Beck was culverted about 60-70 years ago
- Information confirming blockage of watercourse during 28th June 2012 event
- Suggestions including the upsizing of the culvert through the village, altering the inlet grid, and altering the road profile
- Information on other flooded properties around Renwick
- residents have expressed concern that surface dressing of the carriageway leading onto Kirkoswald Road has prevented the flood waters from flowing through the village.
- A further structure was identified that may have had an impact on flood risk, this was the old water system that received water from springs close to the Green Rigg track and was stored in a tank above Renwick village. From United Utilities' records it would appear that this source of water supply has been replaced. The date that this system was abandoned is unknown but the current water supply system is dated 1990 on United Utilities records. It is difficult to identify any evidence that the water supply structures may have helped reduce flood risk in the past. An extract showing the old water supply system is enclosed in Appendix 6.

Appendix 5: Village of Renwick 8th September 1873

Extracts from the Report of the Medical Officer to the Penrith Rural Sanitary Committee about the village of Renwick 8th September 1873

Before suggesting to you gentlemen what I consider necessary improvements in the sanitary condition of the village of Renwick, I think it better briefly to lay before you a description of its present state. A stream of water passes from the head of the village down the centre of about two thirds of its length. This stream receives almost the entire sewage of the village. In some cases the drains convey the liquid sewage efficiently but in many instances there are no drains at all, the night soil being thrown upon the surface to find its way best it can into the stream rendering the soil excrement sodden. As instances of this I refer to 5 cottages situated immediately above the Dryden's residence, also the space in front of Mr Joseph Nicholson's house and Mr Thompson's court yard in the low part of the village, also the parish pinfold. There is also a small water course passing through the parish pinfold, & thence into the stream: as no provision is made for collecting the rain water by spouting the houses, the tanks [in Mr Thompson's court yard] must rapidly fill and occasionally the surplus pass down with the surface water into the parish pinfold which having no proper outlet for the water has become a stagnant pond and the children of the village resorting to this place in the absence of privies renders it a fruitful centre of malaria. In some houses no privy accommodation exists, [and in] others the accommodation is practically worse than none at all - [eg] that supplied for the five cottages above the Dryden's house. The midden in front of Mr Joseph Nicholson's is most pestilential and has no proper outlet for drainage; [likewise] the one situated in the lane leading to Mr Dryden's.

The water supply is good but at a distance which practically means a scanty supply. The collection of rain water by spouting is very rare. No use is made of the water from the stream except by a very few who use it for washing their floors. The medical gentlemen of Kirkoswald inform me that no case of typhoid fever has occurred in Renwick for the last three months. Immediately preceding that time a very dangerous epidemic occurred having for its centres the parish pinfold and Mr Joseph Nicholson's house.

The suggestions which I beg to offer as a remedy for these sanitary deficiencies are [as follows]: (1) drainage - I recommend that the stream continue to be the sewer of the village by paving it on the bottom and sides & left uncovered from where the stream first receives sewage to where it leaves the village *[less expensive than a new sewer and the constant flow will keep it pure]*; (2) a proper means of conveying the sewage from houses to the main sewer to be supplied; (3) the water course through the pinfold to be paved and covered where it passes under walls; (4) for public privies for two or more houses the pail system to be adopted, emptied weekly or monthly under the sanitary supervision (special attention to the 5 cottages and another where the liquid manure saturates through the wall of the neighbouring house); (5) removal of the offending middens.

In 1871 Tom Dryden was living at Highland Hall but may have moved by 1873, and Jonathan Thompson was farming at Town Head. Mr Joseph Nicholson's house was Ravenwood. Location of pinfold uncertain (? behind Sunbeam Cottage).

Cumbria County Council

Environment • Parkhouse Building • Kingmoor Business Park • Carlisle • Cumbria • CA6 4SJ
Tel 01228 221330 • Fax 01228 227662 •
Email lfrm@cumbria.gov.uk

Date: 10 February 2014
Your ref:
Our ref:

United Utilities
Haweswater House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP

FAO Legal Services

Dear Sir/Madam,

Status of Watercourse/Sewer at Renwick, Cumbria NGR: 359701, 543515

Cumbria County Council is currently investigating flooding issues that have occurred in the village of Renwick. As part of these investigations some of the residents have provided information that a reach of the watercourse may have the status of 'public sewer'. This is the section that runs through the village of Renwick. The information that has been provided includes an extract from the Report of the Medical Officer to the Penrith Rural Sanitary Committee about the village of Renwick dated 8th September 1873 which states 'the stream continue to be the sewer of the village'. This is prior to the Rivers Pollution Prevention Act 1876. From the flow chart for identifying a public sewer provided in Land drainage and flood defence responsibilities 4th edition by the Institution of Civil Engineers it suggests that this section may be a 'public sewer'.

I have provided with this letter the extract that was provided to us, and an extract from an old plan showing the proposed water main which on United Utilities records as shown as being laid in 1850.

I would be grateful if you could confirm if United Utilities would view this as a public sewer, however, if you require any further information before you can confirm this then please do not hesitate to contact me.

Yours sincerely

H. Renyard

Helen Renyard
Drainage & Surface Water Officer
Local Flood Risk Management
Environment
lfrm@cumbria.gov.uk
Direct line: 01228 221331

United Utilities Water PLC
Legal Department
Grasmere House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP
Telephone 0845 746 2200
unitedutilities.com

Cumbria County Council
Parkhouse Building
Kingmoor Business Park
Carlisle
Cumbria
CA6 4SJ

For the attention of Helen Renyard

Our ref: AP/483683
Date: 24 March 2014

E-Mail: anamika.paul@uuplc.co.uk
This matter is being dealt with by Anamika Paul

BY POST & EMAIL: irfm@cumbria.gov.uk

Dear Madam

Status of Watercourse at Renwick, Cumbria NGR: 359701, 543515

I write further to your letter dated 10 February 2014 in relation to the above matter.

I understand that you are currently investigating flooding issues that have occurred in the village of Renwick and enquiring as to the status of a watercourse that you believe is a public sewer.

I have considered the information provided by you and make the following comments:-

Extracts from the Report of the Medical Officer to the Penrith Rural Sanitary Committee about the village of Renwick 8th September 1873.

The report by a medical officer makes a recommendation that the stream is to *"continue to be the sewer of the village by paving it on the bottom and sides & left uncovered from where the stream first receives sewage to where it leaves the village"*. However, there is no evidence provided that the recommendation was actually carried out and the extract suggests that this was a temporary arrangement.

In any event I understand that the current status of the stream is a watercourse and does not convey sewage which suggests that the recommendation was not carried out.

Furthermore, under s199 of the Water Industry Act 1991 sewerage undertakers are to keep records of the location of every public sewer or disposal main which is vested in it. This watercourse is not on the sewer map suggesting that it was never classed as a public sewer.

Flow Chart 4th edition by the Institution of Civil Engineers

I have reviewed the flow chart and believe that it is not relevant as the first box in the test refers to "pipe" and you are referring to a watercourse.

United Utilities Water PLC
Legal Department
Grasmere House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP
Telephone 0845 746 2200
unitedutilities.com

Extract of old plan showing proposed water main

I am unclear of the relevance of this map as it relates to a proposed water main not a sewer.

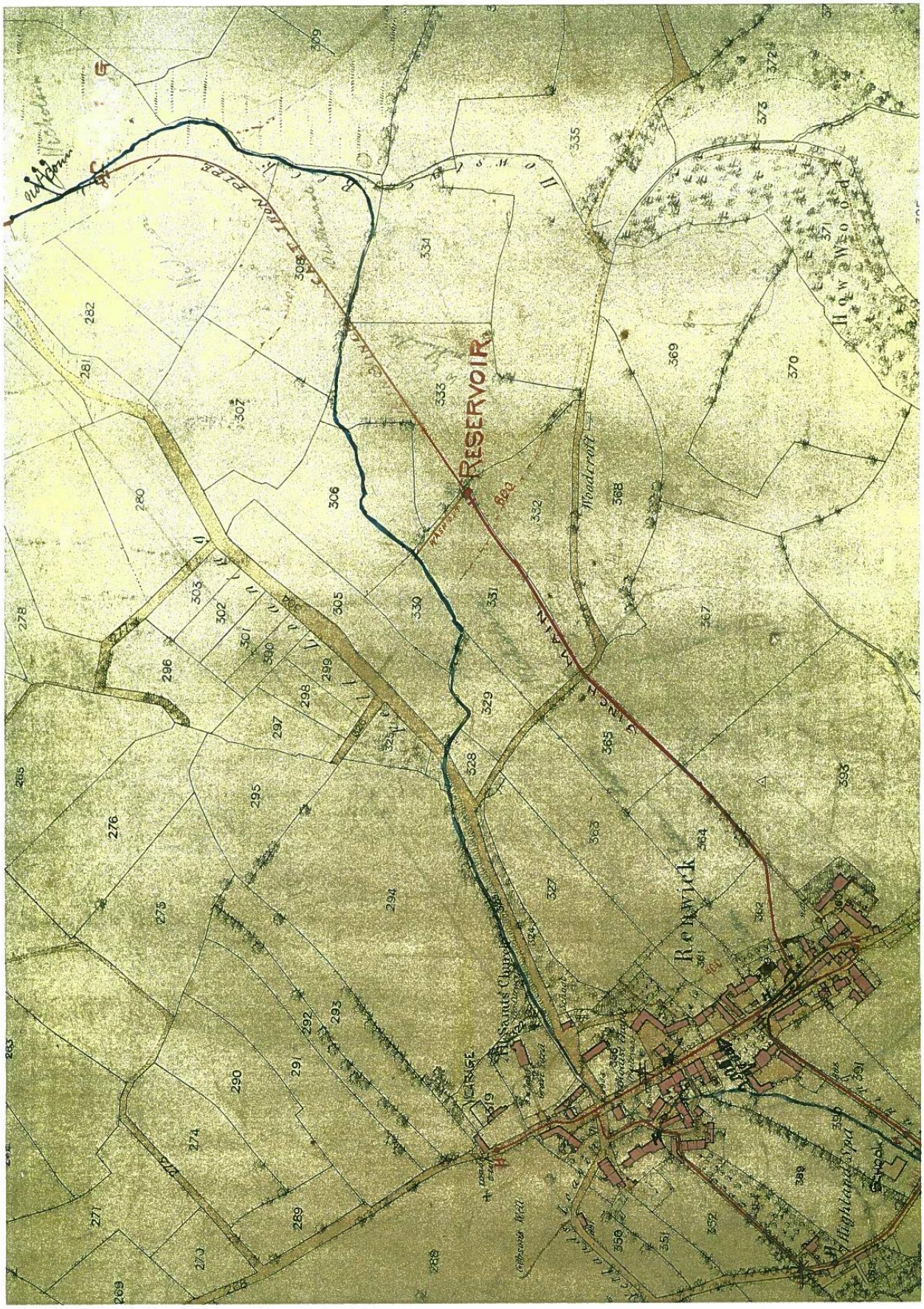
In conclusion United Utilities view is that the watercourse is not a public sewer.

I trust this clarifies United Utilities position.

Yours faithfully

Anamika Paul
Regulatory Solicitor
United Utilities Legal Department

Appendix 6: Plan showing old water supply to Renwick



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