NAA

ARCHAEOLOGICAL
WATCHING BRIEF

Northern Archaeological Associates Ltd

Marwood House
Harmire Enterprise Park
Barnard Castle
Co. Durham
DL12 8BN

t: 01833 690800

e: oc@naaheritage.com

w: www.naaheritage.com

CULVERT REPAIRS
GARRIGILL BURN
CUMBRIA

Project No.: 1465

Text: Eddie Dougherty

Illustrations: Oliver Cooper

prepared for

J N Bentley

on behalf of

The Coal Authority

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Northern
Archaeological
Associates

NAA

01833 690800

info@naaheritage.com

www.naaheritage.com

Marwood House
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Co. Durham
DL12 8BN

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Manager	Oliver Cooper	
Draft	Eddie Dougherty	
Graphics	Oliver Cooper	
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CULVERT REPAIRS, GARRIGILL BURN, CUMBRIA

ARCHAEOLOGICAL WATCHING BRIEF

TABLE OF CONTENTS

CULVERT REPAIRS, GARRIGILL BURN, CUMBRIA
ARCHAEOLOGICAL WATCHING BRIEF

Summary

This report represents the results of archaeological monitoring carried out during repairs to a 19th-century stone-built culvert and regrading of a spoil heap at Garrigill Burn, Cumbria. The programme of groundwork was within the Scheduled Monument of Whitesike and Bentyfield Lead Mines and Ore Works (SM29012; Historic England list entry number 1015832).

The partial collapse of a culvert carrying Garrigill Burn beneath the public road had eroded the mine spoil heap, causing metal-rich waste to pollute the watercourse. The culvert repair was intended to prevent further pollution and involved removing and reprofiling some of the overlying spoil and replacing the missing section of culvert with a large diameter plastic pipe.

Although no features relating to the 19th-century mine complex were revealed by the groundworks, the watching brief achieved its aim of documenting the culvert repairs and the reprofiling of the mine spoil heap. There were few datable artefacts, all of which were from the spoil heap.

Given the relatively undisturbed nature of the deposits within the spoil heap, it is considered that there is the potential for any future groundworks to impact on underlying elements of the mine complex.

The site record will be archived internally at NAA, and the finds will be discarded.

1.0 INTRODUCTION

1.1 This report represents the results of archaeological monitoring carried out in the form of a watching brief during agreed repairs to the 19th-century stone-built culvert at Garrigill Burn, Cumbria (NY 803 470, Fig. 1). The groundwork was within the Scheduled Monument of Whitesike and Bentyfield Lead Mines and Ore Works (SM29012; Historic England list entry number 1015832).

1.2 The archaeological watching brief formed part of a larger programme of investigation and consolidation aimed at reducing the pollution of waterways from mining waste and spoil heap erosion. This section of work entailed the installation of plastic piping to connect existing lengths of masonry arch culvert at Garrigill Burn and the regrading of the spoil heap that supports the Alston to Middleton-in-Teesdale road.

1.3 The archaeological monitoring was undertaken in accordance with a Written Scheme of Investigation (WSI) produced by Northern Archaeological Associates Ltd (NAA 2018) as a requirement of Scheduled Monument Consent granted in July 2018 (reference S00196340).

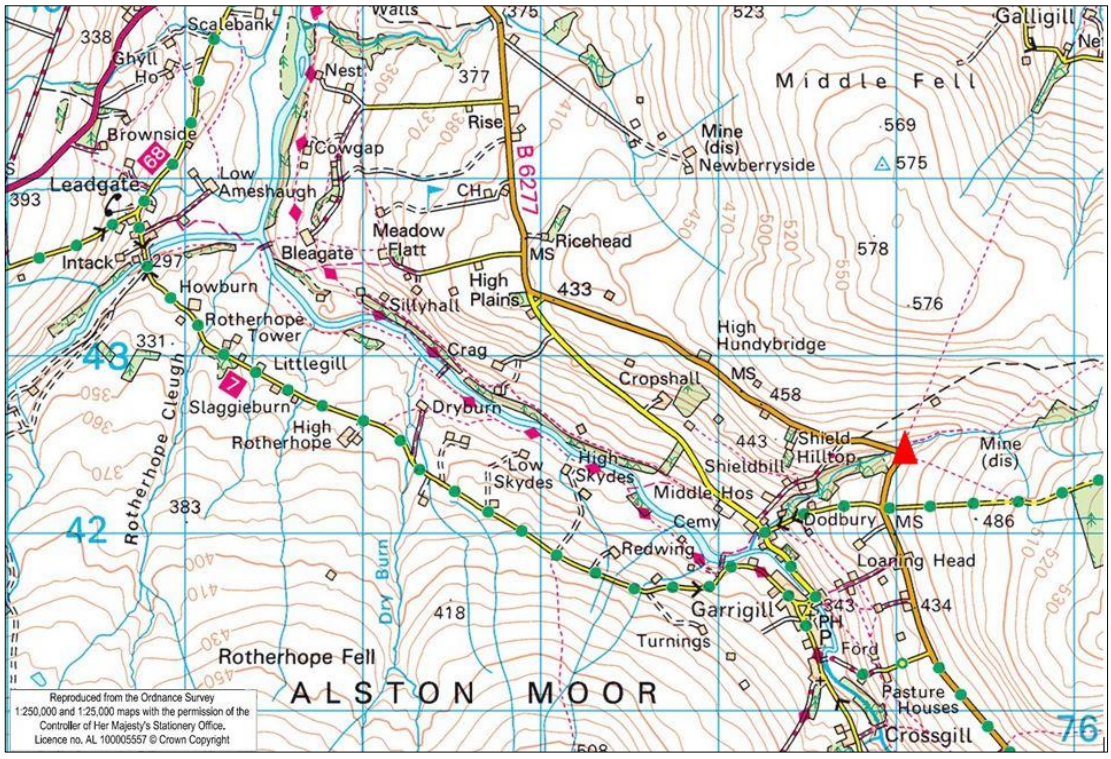

Figure 1. Location of culvert repairs

2.0 LOCATION, TOPOGRAPHY AND GEOLOGY

Location

2.1 The monitoring work was located c. 1.3km to the north-east of the centre of the village of Garrigill, which lies c. 5.5km south-south-east of Alston, Cumbria (Fig. 1). The two sections of arch culvert lay within a spoil heap straddling Garrigill Burn, immediately adjacent to the B6277 Alston to Middleton-in-Teesdale Road (Fig. 2).

Geology and soils

2.2 The local geology comprises Carboniferous limestone, sandstone, siltstone and mudstone of the Alston Formation (BGS 2018). There are no superficial deposits in the immediate vicinity, although there are deposits of peat on the adjacent summits and watersheds (*ibid.*).

Figure 2. Crater within spoil heap caused by broken culvert, as depicted on Google Earth © 2019 Google © 2019 Infoterra Ltd & Bluesky

Topography and land use

2.3 The area covered by the archaeological monitoring comprised a substantial volume of mining waste in the form of a large spoil heap (Plate 1), in part covered by rich *calaminarian* flora. The investigation area was bounded to the north and east by a section of the B6277, the main road between Alston to Middleton-in-Teesdale. To the south and west, where the spoil heap gradually filtered out into Garrigill Burn, the site was bordered by predominantly pine and spruce woodland divided by a meandering fast flowing stream.

Plate 1. View of western side of spoil heap looking towards culvert out-flow

3.0 SUMMARY ARCHAEOLOGICAL AND HISTORIC BACKGROUND

3.1 The following section represents a summary of the archaeological and historic background of the site, which was discussed in the Written Scheme of Investigation (NAA 2018).

Prehistoric and Roman periods

3.2 Aerial mapping of the Alston Moor area identified features relating to prehistoric and Roman land use of the moor (English Heritage 2013, 17). These included six round cairns and a possible hengiform monument, all thought to date to the Bronze Age. Thirty possible prehistoric to Roman settlements were also identified, representing a mixture

of isolated enclosures and settlements with associated field systems. The settlements were located predominantly along river valleys such as the Nent and South Tyne. Two Bronze Age barrows were investigated in 1935 at Kirkhaugh, to the north-west of Alston; one contained a gold earring and flint implements (Wooler and Strickland 2012, 15). A Roman Aureus coin of the 3rd century was found at an unspecified location at Garrigill.

3.3 One of the more prominent Roman sites in the wider vicinity was the fort of Whitley Castle, 8km to the north-west of the monitoring site. The fort had an associated civilian settlement and quarry and was connected to other forts by a series of roads (English Heritage 2013, 32). There is no direct evidence for Roman exploitation of the northern Pennine orefield, though sites have been identified in other areas, such as the Yorkshire Pennines. Metallurgical evidence recovered from Whitley Castle suggests a potential for Roman mineral exploitation in the vicinity (Krupa and Short 1999, 8).

Medieval

3.4 The place name Garrigill has both Norman French and Old Scandinavian etymology, suggesting early settlement nearby. Garrigill was originally 'Geraldsgill', combining the old French personal name of 'Gerard' and Old Norse 'gill', meaning ravine or gully (Wooler and Strickland 2012, 16). Medieval activity is represented by earthworks and cropmarks of ridge and furrow. There is some documentary evidence for medieval lead and coal mining and stone quarrying in the Alston Moor area and there have been finds of Norman coins from the Garrigill mines (Wooler and Strickland 2012, 17). This has led to suggestions that the workings may have formed part of the 'silver mines of Carlisle', mines segregated by Henry I and placed under the control of the Sheriff of Carlisle, and from which silver was sent to the Carlisle mint (Wooler and Strickland 2012, 16).

Post-medieval and modern

3.5 By the early 17th century, much of the manor of Alston Moor was held by the Hylton family. In 1629, when it was sold to Sir Edward Radcliffe, it was reported that the lead seams were nearly exhausted (Krupa and Short 1999, 8). However, the Radcliffes prospered, and increased production on the moor.

3.6 In 1716, Sir James Radcliffe was beheaded for supporting the Jacobite Rebellion of 1715, and his lands seized by the Crown were later granted to the Royal Hospital for Seaman at Greenwich in 1735. A total of 31 mines comprising the Alston Moor mines

were leased by the Greenwich Hospital in 1736. Over the next 150 years, the leases changed hands many times.

3.7 The First Edition Ordnance Survey map of 1859 depicts a range of above-ground features relating to the Garrigill mines – known as Bentyfield and Whitesike mines – including a mine shop, bing steads and washing floor, and blacksmith and joinery shops. The map also indicates that Garrigill Burn had been culverted and provided with aqueducts, with four levels shown in the immediate vicinity. The washing floor was to the east of the main road. The Second Edition Ordnance Survey map of 1899 annotated both Whitesike Mine and Bentyfield Mine as 'disused'.

4.0 AIMS AND OBJECTIVES

4.1 The main aims of the archaeological monitoring were:

- to ensure that no nationally important archaeological remains were affected during the ground disturbance; and
- to mitigate the impact of the ground works upon less-significant archaeological remains

4.2 The objectives were as follows:

- to identify the presence of structures which relate to the lead mines at Whitesike and Bentyfield and, if present, seek agreed methodology that would allow the remains to be preserved in situ;
- to identify and record any archaeological features that do not necessitate preservation in situ;
- to recover any mining artefacts;
- to record the form and nature of the culvert, and associated spoil heap;
- to undertake a programme of investigation that meets with national and regional standards (Historic England 2015a; CIfA 2014a; 2014b; 2014c); and
- to prepare an illustrated report on the results of the archaeological watching brief to be deposited with the Cumbria Historic Environment Record and the Historic England Archive

5.0 METHODOLOGY

5.1 A programme of agreed works and repairs was carried out on two sections of masonry arch culvert, with the majority being centred on a section of collapsed culvert. These

works required temporary removal and reprofiling of spoil and mining waste from in and around the collapsed section, as well as an area surrounding the western entrance of the culvert. This procedure was to aid the installation of a new length of pipeline. This was followed by gradual machine reprofiling of displaced spoil to a shallower, more stable angle over the new pipe and existing lengths of culvert. The objective of profiling was to prevent future subsidence of metal-rich spoil and sediment entering the watercourse.

5.2 Prior to ground disturbance commencing, and when safely accessible, a photographic record was undertaken in the areas of investigation.

5.3 The removal and regrading of the spoil was undertaken using a 360˚ mechanical excavator, fitted with a toothless grading bucket whenever possible, under constant monitoring by the supervising archaeologist. Loose material surrounding the damaged section and entrance to the culvert was also removed mechanically under archaeological supervision. This was in order that consolidation work could be carried out in a safe manner.

5.4 When features and deposits or finds of archaeological interest were suspected, mechanical excavation ceased to allow the supervising archaeologist to observe, investigate and recover finds. Once archaeological excavations were complete, the monitoring archaeologist allowed mechanical operations to recommence.

5.5 The spoil heap and sections of the culvert were photographed, and recorded using standard NAA pro-forma record sheets.

5.6 Securely stratified archaeological finds have been processed and stored in accordance with established guidelines (Watkinson and Neal 1998; English Heritage 1995; Historic England 2014; 2015b).

6.0 RESULTS

6.1 The archaeological monitoring covered three phases of work: the recording of the existing sections of masonry arched culvert; the reprofiling of the spoil heap and the temporary access road; and the construction of a retaining wall at the western entrance to the arched culvert.

6.2 Due to the restricted access for safety reasons, only limited photographic recording of the culvert was undertaken. Prior to any excavation taking place, the end of the culvert

had been consolidated with concrete to reduce the possibility of collapse. The side walls of the culvert comprised up to five courses of roughly tooled rectangular blocks set on the limestone bedrock (Plate 2). Some of the blocks measured at least 1m long by 0.3m deep. It was not possible to enter the culvert to examine the arch in detail, although it could be seen to be constructed of thin slabs set on end in an arc (as seen in the surviving section of culvert to the north of the road, Plate 3).

Plate 2. Entrance to western section of culvert looking eastwards

6.3 The access road and spoil heap profiling comprised the gradual excavation of the metal-rich spoil heap using a mechanical excavator with a toothless grading bucket wherever possible. This demonstrated that the spoil heap was formed from a series of deposits of mine waste consisting of greyish clay (**2**), containing large amounts of limestone and mudstone (**3**), overlain by fine gritty silt (**1**), the by-product of the washing of ore in the hotching tubs (Plate 4). Within the gritty deposit (**1**) were a few artefacts, the smaller of which were recovered for investigation (Appendix B), while a broken spade head and a section of rail were left on site. The recovered artefacts included a partial stoneware mineral water bottle of 19th-century date, a complete 20th-century glass beer bottle, a cast-iron guide roller and two scraps of iron bar, and the upper part of a leather shoe.

Plate 3. Culvert arch to north of road

Plate 4. North-facing section showing construction of mine spoil heap

6.4 After the completion of the temporary access road down to the western entrance to the culvert, levelling of both sides of the burn was carried out in preparation for a retaining wall and water filtration system. This entailed machine excavation prior to the laying of 2-tonne interlocking concrete blocks to hold a gravel filter in place. No archaeological remains were uncovered during these works.

7.0 DISCUSSION

7.1 Although no features relating to the 19th-century mine complex were revealed by the groundworks, the watching brief achieved its aim of documenting the culvert repairs and the reprofiling of the mine spoil heap. All exposed sections of the masonry arched culvert were recorded prior to the installation of new plastic piping. The composition of the mine spoil heap was better understood, allowing consideration of how its volume and mass impact on the masonry arched culvert.

7.2 Given the relatively undisturbed nature of the deposits within the spoil heap, it is considered that there is the potential for any future groundworks to impact on underlying elements of the mine complex.

8.0 ARCHIVE

8.1 The site record will be archived internally at NAA and the finds will be discarded.

8.2 This project has been entered onto the OASIS online database (ref. northern1-333435). A pdf copy of the final approved report will be uploaded to OASIS.

REFERENCES

Archaeological Data Service/Digital Antiquity (2011) *Guides to Good Practice*. Archaeological Data Service, University of York

British Geological Survey (2018) *Geology of Britain Viewer.* [online] available at http://mapapps.bgs.ac.uk/geologyofbritain/home.html [Accessed 8/8/18]

Brown, D.H. (2011) *Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation*. Second Edition. Published by CIfA on behalf of the Archaeological Archives Forum (AAF)

Chartered Institute for Archaeologists (2014a) *Standard and guidance for an Archaeological Watching Brief*

Chartered Institute for Archaeologists (2014b) *Standard and guidance for the collection, documentation, conservation and research of archaeological materials*

Chartered Institute for Archaeologists (2014c) *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives*

English Heritage (1995) *A Strategy for the Care and Investigation of Finds.* English Heritage: Swindon

English Heritage (2013) *Alston Moor, Cumbria: Buildings in a North Pennines Landscape.* English Heritage: Swindon

Federation of Archaeological Managers and Employers (FAME) (2010) *Health and Safety in Field Archaeology*

Historic England (2014) *Animal Bones and Archaeology: Guidelines for best practice*

Historic England (2015a) *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' guide*

Historic England (2015b) *Archaeometallurgy: Guidelines for best practice*

Historic England (2015c) *Digital Image Capture and File Storage: Guidelines for Best Practice*

Krupa, M. and Short, R. (1999) *Nenthead Phase III Assessment Report.* Unpublished client report by North Pennines Heritage Trust

Northern Archaeological Associates (NAA) (2018) *Culvert Repairs, Garrigill Burn, Cumbria: Written Scheme of Investigation*. Unpublished NAA report 18/64

Society of Museum Archaeologists (1995) *Towards an Accessible Archaeological Archive – The Transfer of Archaeological Archives to Museums: Guidelines for use in England, Northern Ireland, Scotland and Wales*

Wardell Armstrong (2018) *Land at Whitesike and Bentyfield Former Lead Mines, Garrigill, Alston, Cumbria: Heritage Impact Assessment.* Unpublished client report

Watkinson, D. and Neal V. (1998) *First Aid for Finds*

Wooler, F. and Strickland, J. (2012) *Whitesike and Bentyfield Mining Complex, Alston Moor: desk-based assessment, archaeological survey and watching brief.* Unpublished client report by NP Archaeology

APPENDIX A

CONTEXT AND FINDS CATALOGUE

Context	Period	Interpretative description	Relationships	Notes
1	19th century	Fine silty mining waste covering slope of burn	Under topsoil and turf	Machine excavated during archaeological monitoring
2	19th century	Mixed clay and rock, mining waste covering slope of burn	Under fine silty mining waste	Machine excavated during archaeological monitoring
3	19th century	Deposit of larger sized rock and clay-stone	Under mixed clay and stone deposit	Machine excavated during archaeological monitoring
4	20th century	Present day ground surface consisting of soil and turf	Overlying fine mining waste covering slope	Machine excavated during archaeological monitoring
5	19th century	Flat-bottomed, semi-circular masonry arch culvert	Under the different types of mining waste	Section located at the base of slope leading up to the B6277
6	19th century	Flat-bottomed, semi-circular masonry arch culvert	Same as context (5)	Entrance to western section of culvert

APPENDIX B

FINDS ASSESSMENT

Charlotte Britton

INTRODUCTION

This report discusses the finds recovered from the 2018 archaeological monitoring at Garrigill mine, Cumbria (NY 803 470). The finds were all post-medieval in date.

METHOD

The finds were recorded on 7 February 2019 in a Microsoft Access database. The finds recording and reporting was completed in accordance with national standards and find-type specific guidance (English Heritage 2008, Chartered Institute for Archaeologists (CIfA) 2014) where possible. This document is available with the site archive.

RESULTS

In total, six finds (2,884g) were recovered from a single context (Table 1). The majority of the finds were 19th–20th century in date and came from the upper layer of a spoil heap, context **1**, and so provide relatively little information about the mine site itself. Three artefacts, however, were distinctive. The first was a cast-iron guide roller. These items were used to support and guide chains to move conveyor belts and transport materials in and out of mines, and this example probably originated from the Garrigill lead mines.

Two bottles were also of significance as they reveal the trade network in the region during the 19th–20th century. The first was a half-complete brown salt-glazed stoneware bottle that indicated worldwide trade networks extended to Garrigill during the post-medieval period. The bottle dated to the 19th century and clearly displayed a circular stamp on the sidewall showing a boat and anchor logo and reading 'Apollinaris-Brunnen M-W'. The name 'Georg Kreuzberg Ahrweiler Rheinpreussen' was embossed below the stamp. Georg Kreuzberg was originally a wine merchant from the Rhineland, Germany (Bottled water web 2019). After purchasing a vineyard in Bad Neuenahr, on which vines would not grow, Kreuzberg eventually discovered a spring of naturally sparkling mineral water. The high concentration of carbon dioxide in the soil was the reason for poor vine growth, although it made for perfect drinking water. The spring was named the 'Apollinaris Fountain', after St Apollinaris of Ravenna, the patron saint of wine. By 1852, a bottling plant was established at the spring, which produced mineral water that was shipped across Europe. The business developed quickly, and by 1913 around 40 million bottles were produced annually at the site, with most being exported all over the world (Bottled water web 2019). Apollinaris water is still produced and traded today, under the Coca Cola company. The stoneware bottle showed a clear link between the lead mine at Garrigill and the Apollinaris Fountain site in Germany and is an example of how far 19th-century commerce reached, even to remote sites such as Garrigill in Cumbria.

The second bottle was a complete glass bottle dated to the early 20th century. It was dark green in colour and displayed a brewery logo on the sidewall, depicting three barrels with 'The Brampton Old Brewery, Brampton' surrounding them. The Brampton Old Brewery was in Brampton, Cumbria, nine miles east of Carlisle, and only 23 miles north of Garrigill. The bottle probably contained stout, mild or pale ale and was ½ pint in volume (Worthpoint 2019). The Brampton Old Brewery was named such between 1910–1926, giving a short date range for the bottle and indicating that dumping of spoil at Garrigill continued during this period, and that the people who worked here consumed the local product (Brewery History 2018). Together, the bottles show how the industry at Garrigill interacted with both near and far businesses and trade networks during the 19th–20th century.

Table 1: summary of finds by context, material and period.

Context	Material	Object	Period	Count	Weight (g)
1	Fe Iron	Guide roller	Post-medieval	1	1,674
		Bar	Unknown	2	13
		Total		3	1,687
1	Glass	Bottle (complete)	Early 20th century	1	444
1	Leather?	Shoe upper	Post-medieval	1	27
1	Pottery	Bottle (partial)	19th century	1	726
Total				6	2,884

RECOMMENDATIONS

The assemblage of identifiable and datable finds from Garrigill mine was extremely small, although does give some indication of activity at the site during the 19th century and later. However, as they were recovered from a secondary context and do not improve any understanding of the site, it is recommended that they are discarded.

REFERENCES

Bottled water web (2019) '*Apollinaris*' [online] Available at <http://www.bottledwaterweb.com/bottlersdetail.do?k=550> (Accessed on 01/05/19).

Brewery History (2018) '*Brampton Old Brewery Ltd*' [online] Available at < http://breweryhistory.com/wiki/index.php?title=Brampton_Old_Brewery_Co._Ltd> (Accessed on (02/05/19).

Chartered Institute for Archaeologists (ClfA), 2014. *Standard and guidance for the collection, documentation, conservation and research of archaeological materials*. Reading: Chartered Institute for Archaeologists.

English Heritage, 2008. *MoRPHE Project Planning Note 3; Archaeological Excavations*. London: English Heritage.

Worthpoint (2019) '*Vintage beer bottle: Brampton Old Brewery*' [online] Available at < https://www.worthpoint.com/worthopedia/vintage-beer-bottle-brampton-brewery-1784120489> (Accessed on (02/05/19).

CATALOGUE

Context 1: Spoil heap

Stoneware bottle with Apollinaris-Brunnen M-W logo. L:232mm, W:87mm. 726g. 19th century.

Complete glass bottle with Brampton Old Brewery logo. L: 106mm, W:65mm. 444g. 20th century.

Cast iron guide roller. Diam:132mm, D:77mm. 1674g. Post-medieval.

Two fragments of an iron bar. L:79mm, W:13mm, D:7mm. 13g. Undiagnostic.

Possible leather shoe upper. L:302mm, W:130mm, D:21mm. 27g. Post-medieval.