



ALTOGETHER ARCHAEOLOGY
Theme 9 - Industrial Archaeology
Fieldwork Module 9c

NENTHEAD LEAD MINES
WATERCOURSES SURVEY
PHASE 2 - EXCAVATION

PROJECT DESIGN



Document control grid

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Contents

1. General introduction to Altogether Archaeology	4
2. Introduction to Altogether Archaeology Theme 9: Industrial Archaeology.	4
3. Nenthead Mines: History	6
4. Previous Works	6
5. The Miner Farmer Landscapes Project	7
6. Project Background	9
7. Water: Power and Process	10
8. Research Aims and Objectives	13
9. Project Scope	15
10. Project Team	15
11. Communications.....	16
12. Methods statement.....	17
13. Stages, Tasks and Timetable.....	22
14. Ownership	23
15. Health & Safety and Insurance	23
16. References	24
Appendix 1. Map and brief description of the 15 proposed small-scale excavations.....	28
Appendix 2. Scheduled Monument List Entry Summary	34

Appendix 3. Altogether Archaeology Generic Risk Assessment.
(Separately bound).

Appendix 4. Module 9c Project Specific Risk Assessment.
(Separately bound).

Cover illustration. View of the smelt mill complex from the River Nent.

1. General introduction to Altogether Archaeology

Altogether Archaeology, largely funded by the Heritage Lottery Fund, is the North Pennines AONB Partnership's community archaeology project. It enables volunteers to undertake practical archaeological projects with appropriate professional supervision and training. As well as raising the capacity of local groups to undertake research, the project makes a genuine contribution to our understanding of the North Pennines historic environment, thus contributing to future landscape management.

The North Pennines AONB is recognised as being of national importance for its scenic beauty, often equated with its ecological and geological diversity. However, these factors alone do not account for the complexity and richness of the landscape, the character of which is dominated by the legacy of human activity, most particularly lead-mining and pastoral farming. Historically, and perhaps far back into prehistory, most of the region's people and settlements were intimately connected with one or other of these activities.

Over an initial 18 month period ending in December 2011, the AA project attracted 400 volunteers and completed a range of fieldwork modules including excavation of prehistoric, Roman, medieval and post-medieval sites, and the survey of complex multi-period archaeological landscapes.

The current Altogether Archaeology programme runs from September 2012 - September 2015. It involves a range of professional and academic partners, and participation is open to all. Work is arranged according to ten themes, ranging from Early Farming to post-medieval Industrial Archaeology. Further information, including reports on work completed and details of how to register as a volunteer, are available on the AONB website.

2. Introduction to Altogether Archaeology Theme 9 (Industrial Archaeology) and Fieldwork Module 9c (Nenthead Mines Watercourses Survey).

Past archaeological research in the North Pennines has been to an extent dominated by fieldwork relating to the area's rich industrial heritage, in particular lead-mining. The Altogether Archaeology project was designed to help redress this imbalance by concentrating on other kinds of archaeology, but there is still scope to include some important industrial archaeological work; indeed it would be remiss of the project to ignore it entirely. Other modules, most notably the Hexhamshire and Allen Valleys surveys, will inevitably involve the low-level recording of industrial sites. This module will concentrate on the detailed survey and investigation of a number of particular industrial sites, concentrating largely on sites deemed to be under threat of loss or serious damage through erosion. To date, important projects have been completed at Dukesfield Smeltnill (Dukesfield Arches) and Shildon Engine House (both Northumberland) and at Killhope Museum Buddle House (County Durham).

Fieldwork Module 9c is located in Cumbria, at Nenthead Mines. The work is being funded by Natural England through the Higher Level Stewardship (HLS) agreement with the landowner, Cumbria County Council. The planned work consists of small-scale excavations at 15 sites identified during the watercourses survey completed by AA volunteers in June 2014. The results will be crucial to the future management of the site as they will contribute to the development of detailed plans to manage the flow of water through the site, which is currently causing serious erosion in places

while also contributing to contamination of the river network. The module offers volunteers the chance to develop their excavation skills on a number of small self-contained excavations, undertaking all tasks from laying out of trenches to recording and report-writing, all with appropriate levels of professional supervision, while also making a genuine contribution to research that will be crucial to future landscape conservation.

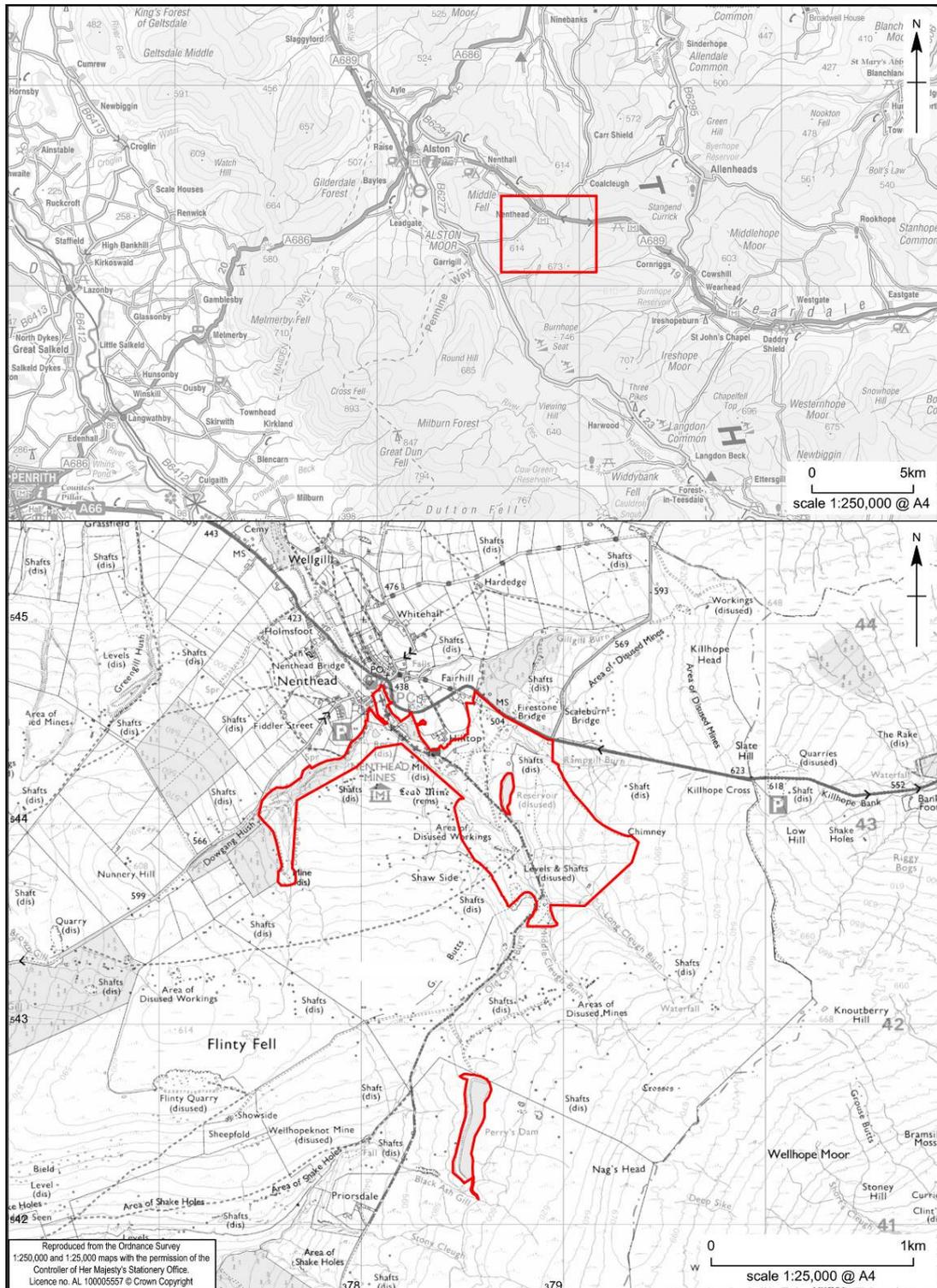


Fig 1. OS Map showing the location of Nenthead Mines, Cumbria. Participants in this project should use the Nenthead Mines Heritage Centre car park, on the south side of the village.

3. Nenthead Mines: History

Mining at Nenthead is likely to date from the 17th century or earlier, but there are no surviving records of specific mines in this area at this time. The first systematic exploitation of Alston Moor commenced in the early 17th century, when the estate passed to Sir Francis Radcliffe, Earl of Derwentwater, in 1618. The mines were reported as exhausted, and the Radcliffes encouraged the systematic development of the mines, with an increase in production from the late 17th century; the first vein known to have been exploited at Nenthead was the Rampgill Vein, from 1692.

In 1716, Sir James Radcliffe was beheaded for his part in the Jacobite uprising in the previous year, and the estate passed to the Crown. In 1735 the Alston Moor estate was granted to the Royal Hospital for Seamen at Greenwich in London. Greenwich Hospital leased out mines on the moor, with one of the major lease-holders being George Liddle, who began working at Nenthead from 1736, and built the first smelt mill. Liddle was not successful, and in 1745, the leases were taken on by the London Lead Company (as it was known colloquially). The company successfully developed and modernised the mines, becoming the largest employer in the area, and also built social and welfare facilities for the miners and their families. The greatest period of production was between 1780 and 1820, but by the early 19th century, cheaper foreign imports began to damage the industry, leading to the ultimate end of lead mining by the early 20th century.

The London Lead Company gave up its leases in 1882. Between 1882 and 1896, the mines were run by the Nenthead and Tynedale Lead and Zinc Company, who struggled in an increasingly volatile market. From 1896, Vielle Montagne Zinc Company of Belgium took up the Nenthead leases for 42 years, concentrating on producing concentrates of zinc and lead from both mined ore and the reprocessing of spoil dumps. The company were very successful, and modernised the mines, using traction engines and locomotives for haulage, and modernising the washing floors. The miners used rock-drilling powered by hydraulic compressors, and acetylene torches replaced candles. In the Second World War, the mines were cut off from their head office by the Nazi occupation of Belgium, and the works were requisitioned by the Ministry of Supply. Following the war, the mines were worked by the Anglo-Austral Mining company (from 1949), and then by a series of small concerns, who were mainly interested in the reprocessing of spoil heaps rather than undertaking further mining. By the 1970s, activity at the site had largely ceased, and the smelt mill and other buildings were systematically destroyed.

4. Previous Work

The Nenthead mines have been subject to a number of archaeological excavations over the last three decades. The first excavations at the site were undertaken by David Cranstone in 1987 and 1988, at the site of an 18th century water-powered stamp mill to the southeast of the car-park (Cranstone 1988a and 1988b).

The North Pennines Heritage Trust (NPHT) was set up in 1987 and became actively engaged in the conservation and interpretation of the Nenthead site. Works progressed in that period from small-scale emergency repairs with limited recording, to a full-scale conservation programme. Some of the buildings on the site, particularly those related to the later phases of activity, were in a good state of preservation and

survived as roofed structures; others, such as the former mine compound buildings at Rampgill (adjacent to the car park), required some repair work. Most of the mineshafts and level entrances were in a reasonable condition, although many were fenced off or gated for reasons of public safety. As a direct result of the conservation programme, significant data was accrued concerning the phased development of several of the standing buildings on the site.

In 1994, the first major conservation works were undertaken on the Rampgill compound, and all the buildings were investigated. An archaeological watching brief also recorded a number of structures and culverts within service trenches, some of which may form part of a wider water management system (Hedley & Cranstone 1995).

In 2005, a field school, the Nent Valley Archaeological Project, was set up at the mines. The Smallcleugh Project, which formed part of it, was undertaken in 2006 and 2007, focussing on the Smallcleugh and Middlecleugh mines. The works comprised the recording and consolidation primarily of mine shops and other buildings (the 2006 season is reported in Sowerby 2006).

The Nenthead mines have also benefited from a number of detailed surveys, commissioned either by the NPHT, the Countryside Commission, English Heritage and/or Cumbria County Council. Archaeological works began in 1985, when detailed non-intrusive ground surveys were carried out by Liverpool University's Environmental Advisory Unit (LUEAU nd) and subsequently in 1993, by the Royal Commission on the Historical Monuments of England (RCHME 1993). Both surveys mapped or planned all surface features at a variety of scales and produced a gazetteer of site components and features. The RCHME report contains basic textual descriptions of the components and collates, as far as possible, all existing survey work. Cumbria County Council's Economic Development Unit also undertook a detailed 1:500 scale contour survey of the site in the same year. In 1995, Barton Howe Warren Blackledge (BHWB 1995) was commissioned by NPHT to produce a draft management plan for the lead mining complex at Nenthead, which also mapped the surface archaeology in detail.

The survey undertaken by BHWB was supplemented by further survey work in 1997, by the Lancaster University Archaeological Unit (LUAU 1997). This examined two defined areas of landscape (an area to the south-east of the main smelt mill complex and the Dowgang Burn and Hush) and identified a further 22 features in those areas.

In 2008, English Heritage commenced the Miner Farmer Landscapes Project, an innovative, multi-disciplinary research initiative begun with the intention of furthering the understanding, conservation and public enjoyment of the historic environment within the North Pennines AONB. The project was undertaken with support from the AONB partnership, local experts and volunteers, universities and other government agencies.

Most recently, in June 2014, AA volunteers, directed by Matthew Town of NAA, completed a survey of watercourses throughout the Nenthead complex. This identified a number of particular sites where more detailed investigation and recording is required in order to understand and manage the flow of water through the site. It is anticipated that the results of this survey will be combined with the results of the planned excavations to produce a comprehensive report on the Nenthead watercourses.

5. The Miner Farmer Landscapes Project

The area selected for the Miner-Farmer project covered the whole of the historic manor of Alston and included a core research area (50 square kilometres) which was the subject of intensive fieldwork. This core encompassed peat moorlands, vast lead-mining remains, enclosed pasture and woodland, mining smallholdings, the principal town of the area, Alston, and two other major mining settlements, Nenthead and Garrigill.

English Heritage's archaeologists developed rapid survey techniques to locate and describe archaeological remains of all periods, combining old-fashioned observation skills with digital recording devices, satellite technology, specially-commissioned photography and laser scanned imagery captured from the air.

A combination of high altitude and remoteness has limited the extent of modern change around Alston resulting in the exceptional preservation of archaeological sites and landscapes. Hitherto this evidence was poorly recorded, but the Miner-Farmer project changed this. Thousands of new sites have been identified and mapped for the first time, including extensive remains of the 18th and 19th century lead-mining industry for which the area is rightly famous. These remains are subject to a bewildering array of pressures ranging from the noticeable effects of climate change to the increased foot-fall of walkers taking advantage of new rights of access. Knowledge gained through the project is an important first step towards management and conservation.

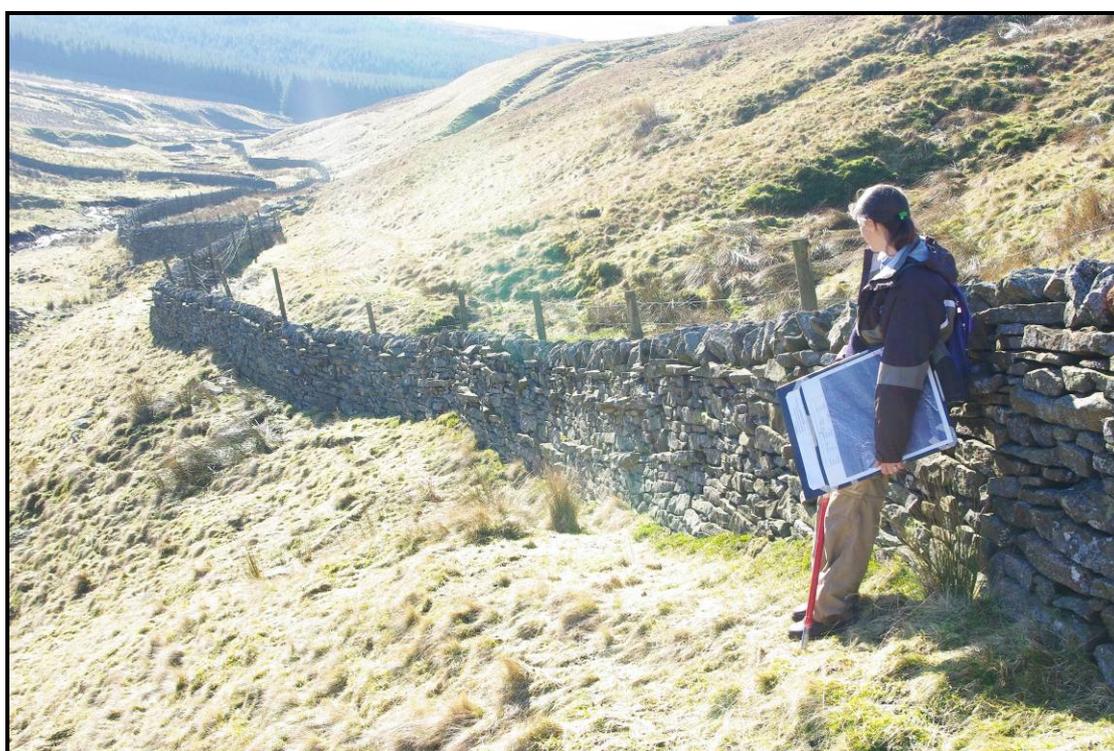


Fig 2. The Miner Farmer Landscape Survey.

In 2011 North Pennines Archaeology Ltd undertook a survey of an 18 square kilometres upland area (known as Block 2A), as part of this survey. The survey area covered the south-east part of Alston Moor, together with the settlements and historic

mining complexes at Garrigill and Nenthead. A total of 2548 sites were identified during the field survey, with the vast majority of the sites being of post-medieval date and directly related to lead mining (Railton and Wooler 2012).

The project is currently unpublished, though details of the MFLP can be found at:

<http://www.english-heritage.org.uk/professional/research/landscapes-and-areas/protected-landscapes/north-pennines/>

The Aerial Investigation and Mapping Report can be found at:

http://services.english-heritage.org.uk/ResearchReportsPdfs/004_2012WEB.pdf

Further Publications:

Ainsworth, S 2009 '*Miner-Farmer landscapes of the North Pennines AONB*' English Heritage Research News **11** 12-16

<http://www.english-heritage.org.uk/publications/research-news-11/>

Jessop, L and Whitfield, M 2013 *Alston Moor, Cumbria: Buildings in a North Pennines Landscape* English Heritage, Swindon



Fig 3. Aerial photograph - the smelt mill complex lies bottom left, with its flue snaking up the hillside. The large reservoir is Handsome Mea.

6. Project Background

This project has arisen through a number of factors, primarily related to the movement of water across the site, arising from within both man-made channels and natural run-off channels, into the main water courses.

The River Nent, the principal water-course within the study area, lies at the base of an incised glacial valley, at approximately 440m AOD, and flows north-westwards towards the village. The river is fed by a series of meltwater channels and small streams. At the head of the valley, the Long Cleugh Burn, the Middle Cleugh Burn and Old Carr's Burn combine to form the main tributaries, with the Rampgill Burn contributing to this river in the vicinity of the smelt mill complex. The Dowgang Burn and Dowgang Hush, the latter a deep steep-sided valley formed by mining, lie immediately west of the car park. The Dowgang Burn flows into the valley from the moorland to the south and flows into the Nent close to the village.

It is from the sides of the tributaries and valley that levels were driven, with the floor of the Nent valley containing extensive lead mining remains, comprising ruined structures associated with ore processing, such as stamp and smelt mills, condensers, compressors, tramways and dressing floors, as well as numerous mining features such as communication routes, spoil tips, reservoirs, watercourses and lodging shops. Many of these features, although legally protected within the Nenthead Scheduled Monument, are now at risk of damage or destruction by flowing water that is no longer constrained within artificial channels; for this reason, English Heritage was keen to see the completion of the recent Altogether Archaeology survey, the results of which will be supplemented by this proposed excavation phase.

The Environment Agency and Natural England have also identified the need to map the water-courses at Nenthead, for differing reasons. The Environment Agency is concerned that the movement of water off the site is puling material, primarily tailings from ore processing, into the main water-courses, which is having an effect on the River Tyne, through the deposition of heavy metals into that water body. However, it is the movement of these deposits, and their subsequent deposition along the water courses as they move towards the Tyne, that has also encouraged the growth of rare metallophytes (lead tolerating plants). A solution to the problem of movement of spoil from the site is not, therefore, a simple one, but the work proposed in this document should help to develop future plans.

7. Water: Power and Process

Water, and the harnessing of water, was immensely important for mining for a wide number of reasons. Within the deeper mine workings themselves, water was a nuisance, as it limited the depth which mines could be worked; drainage from mine workings was therefore of paramount importance. At Nenthead, most of the mining was undertaken from levels, a tunnel (usually driven into a hillside) in order to give access to a mine, which could also be used for drainage or the hauling of broken ore. Most of these survive as beautiful stone-lined structures and were built by the London Lead Company from the 18th century.

In contrast to the deep mining, where water needed removal, surface mining made a lot of use of water, and its collection and redistribution was more important. The technique of hushing was a technique used to prospect and exploit the upper

sections of lead. This involved utilising a flow of water to aid the extraction process, exposing ore and perhaps assisting in releasing and sorting the ore by washing away waste. Water to serve the hushes was collected via leats or gutters, often utilising rainwater sources, and captured in dams or reservoirs close by the hush working to be used when required. These frequently survive as earthworks associated close by the hush remains. Dowgang Hush is the largest and most famous hush at Nenthead, but there are numerous examples across the survey area.

Water was the main source of power for the miners at Nenthead, and was used widely in districts where the topography and the high rainfall enabled extensive use of waterwheels for pumping and draining mines, hoisting ore and spoil to the surface and to power crushing mills, dressing floors and their associated processes. Leats and reservoirs were constructed and along with the wheel pits survive as evidence of these installations. There are many reservoirs at Nenthead, the largest being Handsome Mea and Perry's Dam, though there are numerous small ponds and water catch-pits across the landscape. The network of leats which served the reservoirs, known as feeder or contour leats, extend for many miles following the contours of the hill, to collect as much rainwater as possible. At Nenthead, the makeup of these leats varies: most within the vicinity of the main workings are stone-lined and have flagged caps, and sometimes timber or stone bases, whilst elsewhere some leats are entirely of timber construction, or are just earthworks.



Fig 4. The Stagg Condenser wheel-pit in 1975 (© NMCS archive).

Water was carried across ravines or valleys by launders, wooden or steel troughs which bridge the gap, or carried the water high up to feed water-wheels. The network

encompasses sluice-gates to control the water and divert it to different parts of the site as needed. There are numerous water-wheels within the study area - for example, within the dressing floor at Smallcleugh to power crushers in the dressing mill, or in the centre of the smelt mill to power bellows to provide air blast to the furnaces. Perhaps the most famous wheel-pit is the Stagg Condenser Wheel-pit, a massive wheel which powered a large condenser built to condense any lead fume in the gases leaving the furnaces, invented and patented by Joseph Stagg in 1842.

Water was key to lead dressing, and was widely used on dressing floors, from simple buddles through to the complex industrial-scale processes. All lead ores required cleaning and sorting to some degree. After manual picking the essential processes for the dressing of lead are washing, classifying, reducing (i.e. crushing) and concentrating using gravity, sieving and, later, flotation techniques.

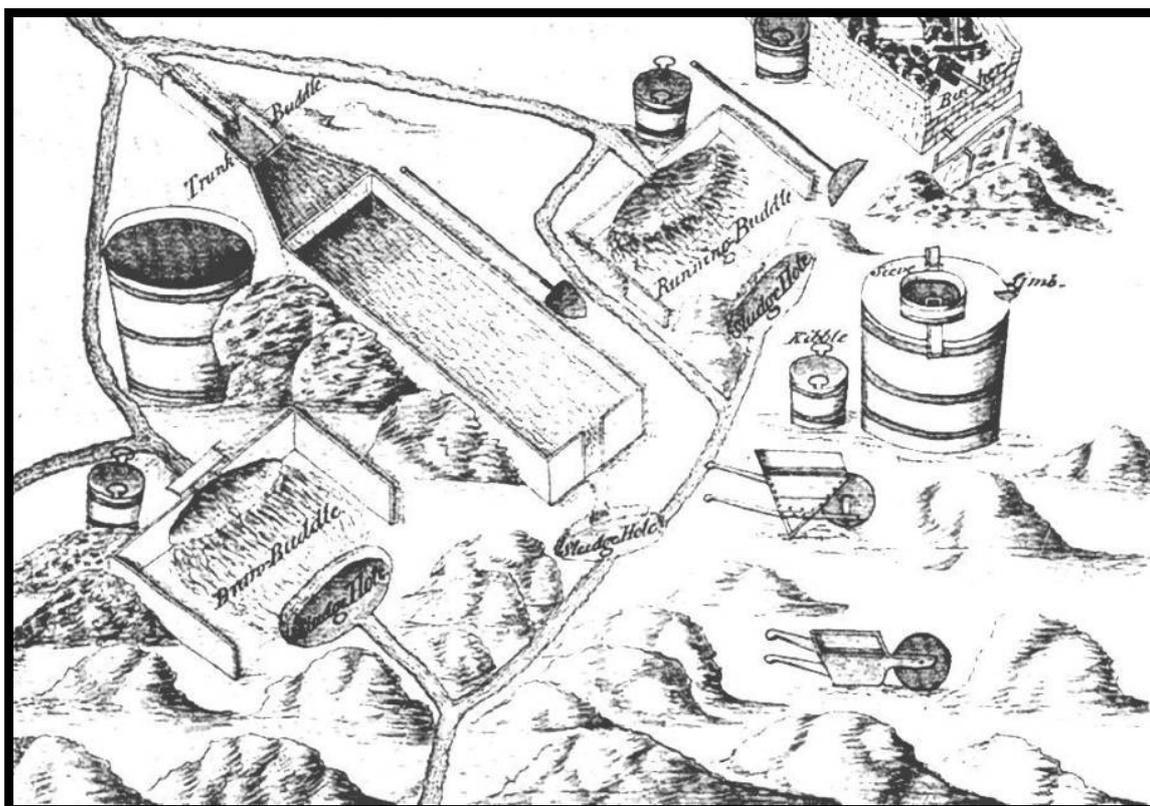


Fig 5. Equipment used for washing lead ore at the end of the 18th century (after Hunt 1970).

Crushing could be carried out by hand using flat-faced hammers known as 'buckers'. Later, crushing rollers, powered by waterwheels, were introduced to Alston Moor from the 19th century and were installed at the Rampgill and Smallcleugh dressing mills. Stamping mills, mechanically-powered stamps for pulverising ore, were used infrequently at lead mines; a stamp mill, dated to the 18th century, was excavated at Nenthead, near to the Power of Water exhibit, in the 1980s.

Ore was concentrated or washed using a variety of gravity and sieving methods, which relied on a disparity in the relative density between the valuable ores and the gangue minerals. The most significant gravity method of dressing lead ore was the buddle. Early buddles comprised rectangular stone or timber-lined, inclined troughs though by the 19th century circular buddles were used. Hand methods such as hotching tubs and jiggers, concentrating devices used to separating the lead ore from the gangue material by repeated suspension and settling in water, are unlikely to have left much specific archaeological evidence, although the areas in which these

operations took place, known as washing floors, often survive as artificially levelled terraces, with stone or part timber surfaces.

From the later 19th century, the main focus of mining at Nenthead switched from mining lead to zinc, and the reprocessing of heaps for materials which had been left behind by earlier miners. The Vielle Montagne Zinc Company used the water to generate electricity on the site, and this in turn was used to power fixed air compressors, which powered rock drills. The company installed a network of pipes across the landscape, connected to the reservoirs, which carried water to Pelton Wheels, water-impulse turbines, which were turned by high pressure jets of water, to generate electricity. Pelton wheels still survive at Nenthead, in the machine room at the base of Brewery Shaft, a 100m deep shaft. The company built a tower over the top of this shaft and channelled water up and over the top of the shaft, before letting it drop down pipes to the machinery at the base.

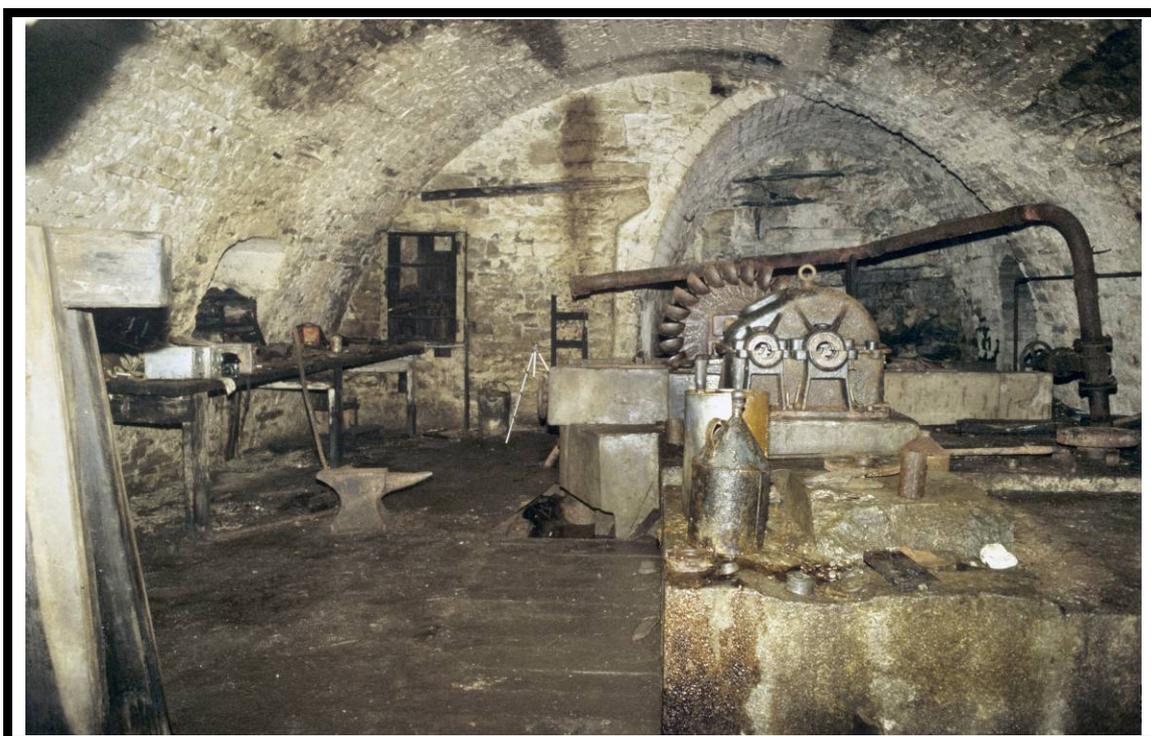


Fig 5. The machinery room at the base of Brewery Shaft - the tools and machinery survive as left nearly 100 years ago. A Pelton Wheel is visible right of centre of the photograph.

Today, the same reservoirs are used by the Nent Hydro Company to power two water turbines, housed in a purpose-built building just north of the smelt mill complex.

8. Research Aims and Objectives

The principal aim of this project is to provide a better understanding of position and function of the man-made watercourses within the Cumbria County Council landholding at Nenthead, as well as the position and flow-paths of natural watercourses, in order that a clear map of these can be produced to inform wider studies related to sediment movement and pollution. The project will build upon the recently completed Altogether Archaeology survey of the site, which recorded the location and

condition of the watercourses. The results will contribute to one of the Miner Farmer Landscape Project Research Questions (Hunt and Ainsworth 2008):

Research Question 8: By selection of specific case studies within the North Pennines, can landscape archaeology and environmental science be applied to further the understanding of the relationship between the historic exploitation of the mineral resource and its impact on the natural environment, erosion and fluvial systems (particularly in relation to climate-change issues).

Objectives

1. Identify types of erosion threats specific to upland lead-mining landscapes.
2. In particular, define the relationship between the methods of extraction (including the processing of products) and the resultant impact on the fluvial dynamics, including erosion and contamination of the hinterland.
3. Use GIS for the building of predictive models which might be applied to other upland landscapes.

The project complies with a number of SHAPE (EH 2008) Sub-Programmes within EH Corporate Objectives 1A and 1D, with a special emphasis being placed on Research Programmes:

- A1, What's out There?: Defining, characterising and analysing the Historic Environment,
- A2, Spotting the Gaps: Analysing poorly understood landscapes and areas
- D2, Measuring the Threat: Studying the reasons for risk and devising responses and, to assist in,
- G1 Sharpening the Tools: Developing new techniques of analysing and understanding;

One of the objectives of the project is to enhance the existing Miner Farmer Landscape Survey database with more detailed information about specific elements of the recorded water-courses. Enhancement of the MFLP is a key component to this project, because it exists as a framework for future survey, with the ability to absorb further information as future work is undertaken. The initial survey was a rapid assessment of the archaeological resource, and augmentation of this should be seen as a natural progression in the life of the project.

A further objective is to provide transferrable skills to a group of local volunteers. Participants will learn the techniques of archaeological excavation and recording that will in turn equip them to carry out further work beyond the life of the project. By focusing on these skills the project will result in a legacy of skilled field surveyors enabled to carry out further archaeological and historical research in the area.

The results of this work will represent a key stage in the study of this important site. They will be of great value in their own right, but will also provide a basis for future conservation, interpretation and research. The project report will also include a brief assessment of the potential for further work, and observations regarding site management including suggestions regarding any particular problems noted during fieldwork.

9. Project Scope

The scope of the fieldwork element of the project will be restricted to the examination and recording of water courses and water management features within the Cumbria County Council landholding at Nenthead, This is self-contained project, the results of which will be produced and disseminated accordingly. Further work to merge the results with those of other Altogether Archaeology fieldwork modules, and other work elsewhere, does not form part of this module. The project report will include outline recommendations for further work aimed at better understanding and management of the site.

10. Project Team

In accordance with standard Altogether Archaeology practice, this project will be overseen by a Project Team, as follows:

Paul Frodsham	North Pennines AONB Partnership Historic Environment Officer and Altogether Archaeology Project Manager.	Overall project management/coordination.
Peter Jackson/Sheila Barker	Nenthead Mines Conservation Society.	Logistics and assistance with fieldwork.
Matthew Town	Project Manager, Northern Archaeological Associates.	Direction of project fieldwork and volunteer training.
Frances Fewster	Historic Environment Advisor, Natural England (North East).	General liaison with natural England.
Andrew Davison	Archaeological Advisor, English Heritage (North-West).	General liaison with English Heritage.

Overall project management will be by Paul Frodsham, assisted if appropriate by other members of the North Pennines AONB Historic Environment Working Group (HEWG). The HEWG is the designated advisory group for the whole of the Altogether Archaeology project; it includes the Cumbria County Archaeologist and English Heritage North-West Region Inspector of Ancient Monuments. Paul Frodsham will be responsible for co-ordinating volunteer involvement in the project, and for preparatory work including liaison with the landowner and the provision of site facilities.

Fieldwork will be undertaken by Altogether Archaeology volunteers with training and supervision provided by Matthew Town and possibly also other professional staff from Northern Archaeological Associates, who have extensive experience working on comparable projects with volunteers. It is expected that Paul Frodsham will also be on site for much of the time, but his role will be to assist the fieldwork director rather than to direct the fieldwork himself. Northern Archaeological Associates staff will be responsible for the production of the project report. Paul Frodsham will produce a risk

assessment, and will be responsible for health and safety on site throughout fieldwork.

The Altogether Archaeology project has a pool of some 560 volunteers, of whom up to 50 are expected to participate actively in this module. Although there must be some flexibility with regard to volunteer involvement, up to 25 volunteers are expected on site each day. Paul Frodsham will draw up a rota showing which volunteers expect to be on site each day, and fieldwork can then be planned accordingly. Some volunteers are more experienced than others, but all will receive an appropriate level of training and supervision. Experience gained here at Nenthead should then be of value to future projects.

11. Communications

Paul Frodsham maintains a volunteer database of all *Altogether Archaeology* volunteers, and information about the project will generally be disseminated by email or telephone using contact details contained within this database. For ease of communication, any local people wishing to take part in the Nenthead project who have not registered with the *Altogether Archaeology* project will be asked to do so, at least temporarily. All communication with volunteers will then be via the *Altogether Archaeology* volunteer database.

Paul Frodsham, Peter Jackson, Sheila Barker, and Matthew Town will be in daily contact during the fieldwork phase, and will communicate as necessary by email, telephone and face to face meetings as necessary during project planning and post-survey phases.

The North Pennines AONB Historic Environment Working Group (the advisory group for the Altogether Archaeology project) meets quarterly. A draft report on the results of this project will be presented by PF for discussion at the first meeting following completion of the project.

12. Methods statement.

12.1 General

All work will be completed according to relevant professional standards and guidelines. Fieldwork will be undertaken by volunteers from the Altogether Archaeology project, with training and constant on-site supervision provided by highly experienced professional staff from Northern Archaeological Associates, assisted by Paul Frodsham.

The Project Design incorporates a degree of flexibility; decisions will be taken according to factors such as ongoing results, numbers of volunteers attending, and the weather. Volunteers will be encouraged to take part in discussion and debate about the project design while work is in progress and during lunch breaks.

It is proposed that the initial fieldwork phase will take place over two weeks in late September and early October. A volunteer programme will be prepared, with a maximum of twenty-five volunteers on site each day. Full training will be provided to all volunteers, who will be closely supervised throughout the fieldwork.

Welfare facilities (a room to act as a canteen for lunch breaks or for shelter in bad weather, along with toilet and washing facilities) will be available within The Barracks, Nenthead Mines, in the centre of the survey area. Car parking will be in the car park at the mines, immediately adjacent to the village. The basic working day will be from 10am through until 4pm, with breaks. Volunteers should report to the car park at 9.45 each morning.

12.2 Pre-start planning and start-up meeting

Onsite project planning discussions were held by Paul Frodsham, Matthew Town and Peter Jackson during the survey phase in June 2014. Subsequent discussions by phone and email have resulted in the current proposed programme.

There will be an on-site project start-up meeting, including a general introduction to the Nenthead Mines, overground and underground tours of the site, discussion of the results of the survey phase, and health and safety induction, on Monday 22 September. Participating volunteers will be encouraged to attend this meeting, although it may be that some are unable to attend on the first day, in which case all relevant information will be made available on the first occasion that they attend.

12.3 Evaluation trenches

12.3.1 This is an evaluation of specific features within the network of watercourses throughout the Nenthead complex. The aim is not to fully excavate features encountered, but to record them and where appropriate sample them. The aim is to provide an accurate record of the buried remains that survive on the site, primarily by uncovering and recording sections across leats and other structures. It is proposed to excavate small evaluation trenches in up to 15 different places as shown in Appendix 1. The results will be of value to future site management, while also enabling an assessment of potential for further investigation.

12.3.2 Trenches will be excavated by hand to either the top of archaeological deposits, or the natural substrate, whichever is observed first. Trenches will be subsequently cleaned and all features investigated and recorded as deemed appropriate by the Project Director.

12.3.3 All excavated contexts will be recorded in plan and section and recorded on stratigraphic matrices. Plans and sections will be drawn at appropriate scales (generally either 1:10 or 1:20). The excavations will be accurately tied into the OS national grid and accurately levelled, relative to OS datum, using traditional survey techniques (see 1.3.1, above).

12.3.4 This exercise is concerned primarily with the recording of structures, and few significant finds are expected. However, all finds will be retained and recorded by context. The Project Director will undertake any necessary emergency first aid conservation to finds; if further conservation is required this will be done according to the recommendations of appropriate specialists. Finds will be removed to a secure location at the end of each day, but (other than any extremely fragile finds that will be stored safely away from site) will be returned to site each day while work is in progress; this is so they can be examined by volunteers and visitors. No finds will be discarded prior to post-excavation assessment.

12.3.5 During and after the excavation, all recovered artefacts will be stored in the appropriate conditions to ensure minimal deterioration and loss of information (this will include controlled storage, correct packaging, regular monitoring of condition, and immediate selection for conservation of vulnerable materials). All work will be carried out in compliance with IFA Guidelines for Finds Work and those set by UKIC.

12.3.6 Any material from secure contexts deemed potentially suitable for scientific analysis will be recovered and stored in appropriate conditions. Recommendations regarding such analysis may be included within the Project Report. If required, expert advice regarding scientific analysis will be sought from appropriate experts.

12.3.7 It is thought most unlikely that human remains will be encountered at this site. However, should human remains be discovered, the County Historic Environment Service and the Coroner's office will be informed immediately. No such remains will be removed unless such removal is

essential to the completion of the fieldwork. The removal of any human remains will be done under strict Home Office licence and environmental health regulations.

12.3.8 During fieldwork, turf, soil and stone will be stored in separately piles adjacent to the trenches but not impinging on the areas to be excavated. Upon completion of fieldwork, trenches will be backfilled and the ground surface reinstated as close as reasonably possible to its original profile, unless it is agreed with EH that particular features should be left wholly or partially exposed.

12.3.9 A comprehensive digital photographic record of the excavation, including 'people shots' of excavations in progress as well as standard shots, will be made. All such images will be accessed into the site archive, with an appropriate selection included within the project report.

12.3.10 A comprehensive Project Diary will be maintained throughout the fieldwork phase, to which volunteers will be encouraged to contribute. This will include details of personnel present each day, and the different tasks undertaken each day by each volunteer. The diary will form part of the project archive.

12.3.11 The Cumbria County Archaeologist will be informed of the dates of fieldwork and he or his representative(s) will be welcome to visit and inspect the site for monitoring purposes at any reasonable time while work is in progress.

12.4 Post excavation, Archive and Report Production

12.4.1 The fieldwork programme will be followed by an assessment of finds and samples as set out in the *Management of Archaeological Projects* (2nd Edition, 1991). All finds and samples will be assessed regarding potential for further analysis and conservation/storage requirements. Any finds deemed not worthy of retention will be discarded at this point. All retained finds will be cleaned, marked, photographed and/or drawn, and bagged for long-term storage.

12.4.2 Specialists will be called on, as necessary, to examine, process and assess excavated finds and samples.

12.4.3 Archive

The project archive will be prepared to the standard specified in Appendix 3 of MAP2 (English Heritage 1991) and in accordance with the Guidelines for the Preparation of Archaeological Archives for Long Term Storage (UKIC 1990). The archive will include all of the project records, to include all paper, plastic and digital media will be assembled in accordance with the standards set by the National Archaeological

Record and deposited with Nenthead Mines Conservation Society archive. The archive will include

- Copies of all relevant documentary material
- Bibliographic, cartographic and pictorial sources
- All survey control information
- All digital survey data
- Final field and ink drawings
- All digital photographs in an appropriate format
- All written accounts and gazetteers
- All documentary material including Project Management records.

12.4.4 Project synthesis and reporting

The results of all of the excavation work will be merged with the earlier survey results and synthesised into a single report for the project. This will primarily be undertaken by Matt Town who will also include references to other relevant aspects of the Nenthead site based on his recent work here linked to ongoing conservation work.

The report will include

- Executive summary
- Contents page
- Introduction
- Project background and context
- Aims and objectives
- Methodology and method statement
- Project area
- Non-technical summary of survey results
- Results
- Discussion and review
- Conclusions
- Bibliography
- Illustrations and photographs

- Gazetteer of sites

Recommendations for further archaeological work, if applicable, will be set out in the conclusions, but any such follow-up work will not form part of this project.

Two hard copies of the report will be provided to the AONB Partnership, and one hard copy to the Cumbria HER. In addition, high and low resolution pdf versions will be provided for the AONB Partnership, to be used on the AONB website and/or copied to project volunteers and other interested parties as appropriate.

12.4.5 OASIS

Northern Archaeological Associates is registered with the Online Access to the Index of archaeological investigations project (OASIS). An OASIS form will be completed for this project. It is understood that after validation by the HER, and with the agreement of all the parties concerned, the project report may become a publicly accessible document.

12.4.6 Publication

Recommendations for publication will be made if required following completion of the works (including any further schemes of works): this may include a submission to the Cumberland and Westmorland Archaeological and Antiquarian Society journal. The nature and extent of the publication will be dependent on the results of the work.

12.4.7 Publicity

Decisions regarding publicity of the project will be made, subject to the nature of results, during and after fieldwork. Any publicity relating to the site will only occur following consultation with the landowner. Should such publicity be considered desirable, it will be arranged through the AONB Partnership's Publicity Officer. Depending on results, a public tour of the site may be arranged towards the end of fieldwork, and a public lecture on the results will be given in The Barracks, Nenthead Mines later in the year.

12.4.8 Project review

The project will be subject to continuous review by the Project Director who will be on site throughout the fieldwork. Should any changes to the proposed programme become desirable during the course of the project then it will be necessary for these to be approved by English Heritage.

13. Stages, Tasks and Timetable

This project is divided into three stages and 16 tasks as shown in the table below.

Fieldwork is planned for September/October 2014. Results analysis, and report production will proceed as soon as possible following completion of fieldwork.

STAGE or Task No.	STAGE/Task	Person(s) responsible	Dates (2014 unless stated)
S 1	PREPARATION		
T 1.1	Preliminary site meeting.	MT/PF/PJ	June
T 1.2	Finalising of MORPHE compliant project design and EH & NE approval.	PF/AD/FF	Aug
T 1.3	Obtain Scheduled Monument Consent	PF/AD	Aug
T 1.3	Clarify provision of on-site facilities and produce risk assessment.	PF/PJ	10 Sept
T 1.4	Notification of project dates to volunteers	PF	Aug
T 1.5	Circulate PD to volunteers with invitation to register.	PF	10 Sept
T 1.6	Closing date for volunteer registration.	PF	10Aug
T 1.7	Agree volunteer participation rota - inform volunteers.	PF	15 Sept
S 2	FIELDWORK		
T 2.1	Start-up meeting and site set-up	Volunteers/MT/PF/PJ	22 Sept
T 2.2	Fieldwork	All	22 Sept - 5 Oct
S 3	REPORT, ARCHIVE & PUBLICITY		
T 3.1	Collation and analysis of results, including incorporation of all results into project GIS.	MT	Nov
T 3.2	Production of project report (including recommendations for further work)	MT	Dec/Jan
T 3.3	Presentation of report to HEWG	PF	Feb 2015
T 3.4	Deposition of archive, dissemination of final report to HER & OASIS	MT	Feb 2015
T 3.5	Link to Project Report placed on AONB website.	PF	Feb2015
T 3.6	Contribution to <i>Altogether Archaeology</i> annual public conference.	PF/MT/volunteers	tbc

MT = Matthew Town (Northern Archaeological Associates)

PF = Paul Frodsham (North Pennines AONB Partnership)

PJ = Peter Jackson (Nenthead Mines Conservation society)

AD = Andrew Davison (English Heritage)

FF = Frances Fewster (Natural England)

14. Ownership

The land is owned and managed by Cumbria County Council, and forms part of the North Pennines Area of Outstanding Natural Beauty (AONB). The site was leased by the North Pennines Heritage Trust between 1987 and 2011, but since its liquidation, the lease has reverted back to Cumbria County Council. Limited outreach activity and care-taking duties are now carried out by the Nenthead Mines Conservation Society (NMCS) - <http://www.nentheadmines.com/>.

15. Health & Safety and Insurance

Full consideration will be given to matters of health and safety throughout this project. All work will be undertaken in accordance with the 1974 *Health and Safety Act* and its subsequent amendments, the 2007 *Construction Design and Management Regulations*, and the Standing Conference of Archaeological Unit Managers (SCAUM) Health and Safety Manual (2007). Work will also take place under the terms of the NAA's *Health and Safety Policy*.

A full Risk Assessment will be undertaken to assess all real and potential hazards prior to the commencement of fieldwork. A comprehensive health and safety induction will be given to all volunteers at project start-up, and all will be required to read a written statement on health and safety which will be kept on site and which all volunteers partaking in the project will be required to sign, stating that they have read and understood it and that they will abide by its terms. A generic Risk Assessment for Altogether Archaeology fieldwork is included herewith as Appendix 3, and a specific Risk Assessment for this module forms Appendix 4.

Paul Frodsham will ensure that at least one qualified First-Aider and appropriate first aid supplies are on site at all times while fieldwork is in progress. Staff members will be supplied with appropriate safety clothing and equipment, and advice as to appropriate clothing and equipment will be provided to volunteers.

Welfare facilities will be available within The Barracks or Assay House, in the centre of the survey area.

All aspects of the Altogether Archaeology project are covered by Durham County Council's comprehensive insurance policy. In addition, NAA staff are covered by their own insurance.

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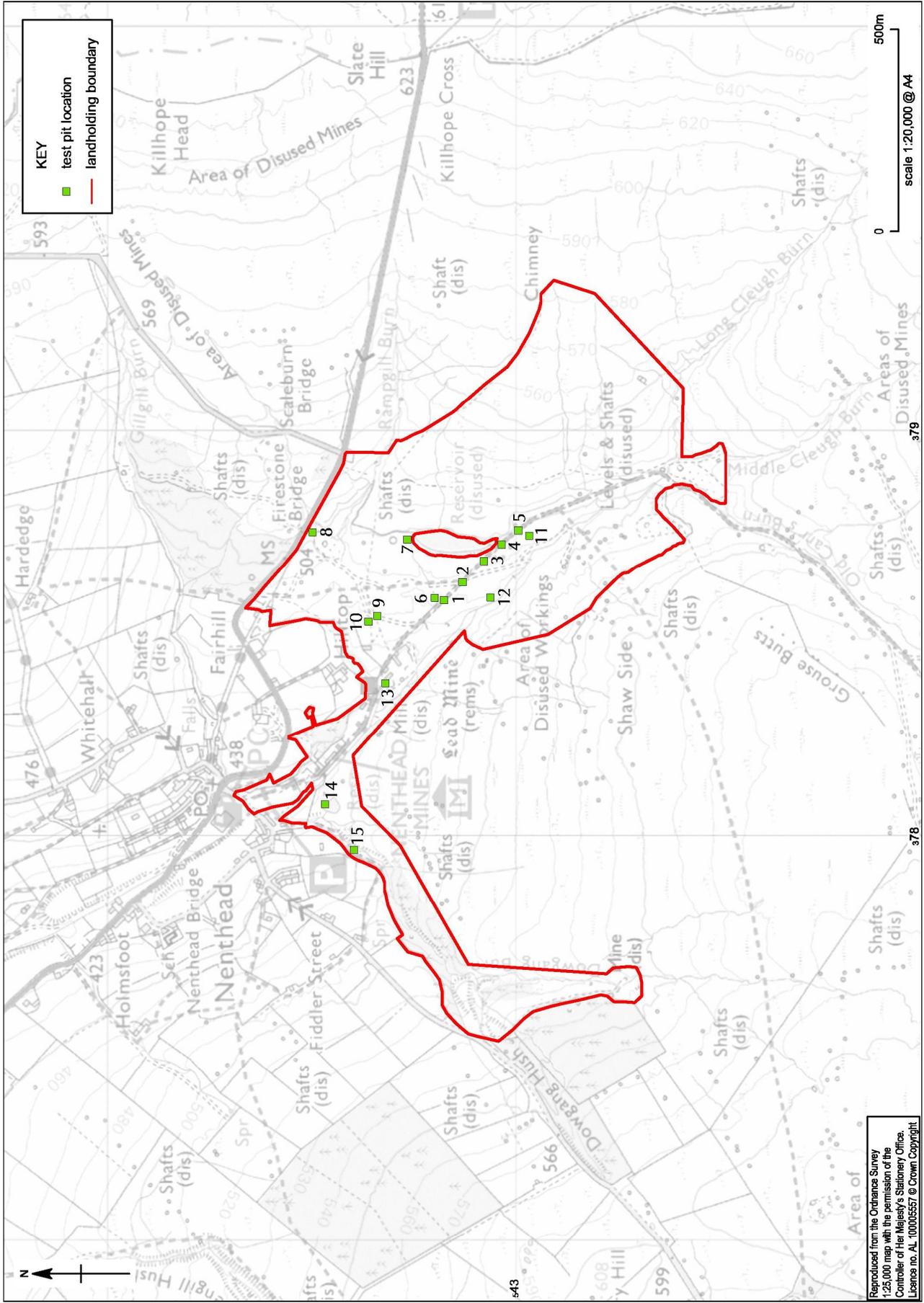
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Appendix 1. Map and brief description of the 15 proposed small-scale excavations.

Testpit No	MFLP Feature No.	Location	Easting	Northing	Damage Notes	Reason for Excavation
1	2460	NE side of Quarry Track	378582	543175	Leats blocked, water poaching onto road	Unblocking of leat to allow water flow, investigation of leat and arching, unblocking culvert to leat to north
2	2460	NE side of Quarry Track	378625	543128	Future Blockage Issue	Collapsed leat, clear blockage, excavate around leat, record
3	2460	NE side of Quarry Track	378676	543074	Future Blockage Issue	Collapsed leat, clear blockage, excavate around leat, record
4	2460	NE side of Quarry Track	378717	543032	Future Blockage Issue	Collapsed leat, clear blockage, excavate around leat, record
5	NA	NE side of Quarry Track	378754	542993	Water From road spilling over causing damage to SW and to retaining walls	Investigative trench in boggy area to try and pick up trackside leat, open up, to allow drainage (water flowing across road)

6	2462	Culvert NE of track	378587	543198	Collapse in culvert forcing flow of water N, eroding out side deposits	Excavate trench down to void, clean out, record, and repair
7	2440	N of Handsome Mea	378732	543363	Blocked overflow leat, collapsed and silted at west end	Clean out and repair west end, record
8	29	Firestone Level	378750	543491	Leat 29 originally ran east and over launder base, now breached on s. side, water running down slope from Firestone Level	Excavate testpit to examine cause and flow of water
9	NA	Unnumbered Culvert	378542	543338	Water from roadside gully (modern) spilling down into smelt mill area	Excavate testpit to pick up side up culvert, record, install catchpit and pit to take flow into existing culvert system
10	2524	E of Stagg Wheelpit	378529	543360	NA	Investigative works to look at fenced area, clear leats, establish flow paths (connections of multiple leats)
11	NA	N of Smallcleugh Level	378741	542966	Soft-capping of spine wall will use turf from here; possible unrecorded dressing floors.	Investigate underlying deposits to mitigate against runoff destroying archaeology floors.

12	2478	W of Smallcleugh Dressing Floor	378588	543061	Waterflow over wall causing damage.	Excavate test-pit along east side of wall, to 0.5m depth, establish
13	NA	Barracks	378377	543318	Problems with drain, where does water outfall?	Excavate testpits to find and clear drain
14	201	Dowgang Dam	378078	543466	Failure of sluice/pipe, damside collapsing, water poaching to N (flagged by CMP but dropped due to funds)	Excavate testpits each side of dam, to examine issues with dam, suggest remedial action
15	302	Dowgang Hush	377966	543396	Survey discovered fragmentary dam, being eroded by river, will be destroyed by future bursts	Clean and record structure, excavate west side where possible building located



Nenthead AA Watercourse Survey: test pit locations **Figure 1**

Appendix 2 - Scheduled Monument List Entry Summary

This monument is scheduled under the Ancient Monuments and Archaeological Areas Act 1979 as amended as it appears to the Secretary of State to be of national importance. This entry is a copy, the original is held by the Department for Culture, Media and Sport.

Name: Lead mines, ore works and smeltnill at Nenthead

List entry Number: 1015858

Location

The monument may lie within the boundary of more than one authority.

County	District	District Type	Parish
<i>Cumbria</i>	<i>Eden</i>	<i>District Authority</i>	<i>Alston Moor</i>

National Park: Not applicable to this List entry.

Grade: Not applicable to this List entry.

Date first scheduled: 02-Apr-1982

Date of most recent amendment: 06-Aug-1997

Legacy System Information

The contents of this record have been generated from a legacy data system.

Legacy System: RSM

UID: 28906

Asset Groupings

This list entry does not comprise part of an Asset Grouping. Asset Groupings are not part of the official record but are added later for information.

List entry Description

Summary of Monument

Legacy Record - This information may be included in the List Entry Details.

Reasons for Designation

Approximately 10,000 lead industry sites are estimated to survive in England, spanning nearly three millennia of mining history from the later Bronze Age (c.1000 BC) until the present day, though before the Roman period it is likely to have been on a small scale. Two hundred and fifty one lead industry sites, representing approximately 2.5% of the estimated national archaeological resource for the industry, have been identified as being of national importance. This selection of nationally important monuments, compiled and assessed through a comprehensive survey of the lead industry, is designed to represent the industry's chronological depth, technological breadth and regional diversity. Nucleated lead mines are a prominent type of field monument produced by lead mining. They consist of a range of features grouped around the adits and/or shafts of a mine. The simplest examples contain merely a shaft or adit with associated spoil tip, but more complex and (in

general) later examples may include remains of engine houses for pumping and/or winding from shafts, housing, lodging shops and offices, powder houses for storing gunpowder, power transmission features such as wheel pits, dams and leats. The majority of nucleated lead mines also included ore works, where the mixture of ore and waste rock extracted from the ground was separated ('dressed') to form a smeltable concentrate. The range of processes used can be summarised as: picking out of clean lumps of ore and waste; breaking down of lumps to smaller sizes (either by manual hammering or mechanical crushing); sorting of broken material by size; separation of gravel-sized material by shaking on a sieve in a tub of water ('jigging'); and separation of finer material by washing away the lighter waste in a current of water ('buddling'). The field remains of ore works vary widely and include the remains of crushing devices, separating structures and tanks, tips of distinctive waste from the various processes, together with associated water supply and power installations, such as wheel pits and, more rarely, steam engine houses. The majority of nucleated lead mines with ore works are of 18th to 20th century date, earlier mining being normally by rake or hush and including scattered ore dressing features (a 'hush' is a gully or ravine partly excavated by use of a controlled torrent of water to reveal or exploit a vein of mineral ore). Nucleated lead mines often illustrate the great advances in industrial technology associated with the period known as the Industrial Revolution and, sometimes, also inform an understanding of the great changes in social conditions which accompanied it. Because of the greatly increased scale of working associated with nucleated mining such features can be a major component of many upland landscapes. It is estimated that several thousand sites exist, the majority being small mines of limited importance, although the important early remains of many larger mines have often been greatly modified or destroyed by continued working or by modern reworking. A sample of the better preserved sites, illustrating the regional, chronological and technological range of the class, is considered to merit protection.

The Nenthead mining complex is regarded as the most intact mining landscape within the North Pennines. The main importance of the site lies in the unusually high level of preservation not only of the obvious features such as the buildings and dams, but also the network of roadways built by the London Lead Company. The wide range of mining features provide an important resource for the study of the developments in mining technology in the 18th and 19th centuries, particularly the development of deep mining based on long adits (levels). The monument also preserves a good example of the inter-relationships between the mining features, buildings and water managements system. Ore hearth smelting mills were introduced in the 16th century and continued to develop until the late 19th century. They were the normal type of lead smelter until the 18th century when they were partly replaced by the reverberatory smelting mill. The ore hearth itself consisted of a low open hearth in which lead ore was mixed with fuel. An air blast was supplied by bellows, normally operated by waterwheel; more sophisticated arrangements were used at some 19th century sites. Early sites were typically small and simple buildings with one or two hearths, whereas late 18th and 19th century smelting mills (like Nenthead) were often large complexes containing several ore and slag hearths, furnaces, and sometimes complex flues, condensers and chimneys for recovering lead from the fumes given off from the various hearths and furnaces. The remains of the Nenthead smelting mill complex, including the assay house, are an important source of evidence for the interpretation of 18th and 19th century developments in smelting technology. Despite damage in c.1970, substantial structural and processing evidence remains. The site also contains the remains of the rare Stagg condenser with its unusual crenellated wheelpit. In addition, the lack of ground disturbance indicates that buried deposits will also survive. A considerable archive of early photographs of many features of the site also exists. It is accessible to the public and is a valuable educational resource.

History

Legacy Record - This information may be included in the List Entry Details.

Details

The monument includes the structural, earthwork and other remains of the Nenthead mines, ore works and smelting. The monument, falling within two areas, lies at the head of the Nent Burn, south west and south east of Nenthead village on Alston Moor. The first documented mining activity on Alston Moor dates from the 12th century and it is thought that exploitation was originally on a relatively small and intermittent scale up to the 17th century. Major ore extraction appears to have begun at Nenthead in the 17th century with the discovery of the Rampgill Vein in 1690. It became one of the main mining areas of the London Lead Company by the mid-18th century. They consolidated their leases as production peaked in the 1820s, and this was subsequently followed by gradual decline until 1882 when the company gave up the last of its Nenthead leases. These were sold to the Nenthead and Tynedale Zinc Company, who were in turn succeeded by the Veille Montagne Zinc Company in 1896. As these names suggest, the focus of mining shifted from lead to zinc over this period. Intermittent production continued until 1963, latterly reprocessing the old waste tips for fluorspar. Standing and buried remains of the early mining operations at Nenthead are situated immediately south of Nenthead village at the Rampgill Horse Level which was begun in 1690. The level portal survives intact and measures up to 1.2m wide and 2m high, with walls of roughly coursed stone rubble and a roof of flat stone slabs. The adjacent early 19th century building complex, which includes a woodstore, smithy, workshops and other buildings with associated walled yards, extends 110m to the south east. The workshop building, situated to south of the level, is 'L'-shaped and consists of a south west range measuring 26m by 7m, and a narrow south east range measuring 12m by 3.6m. The building is of a single build and is constructed of neat roughly-coursed sandstone masonry. The woodstore situated to the south east consists of two main phases. The original building was 25m by 5.8m but was later extended to 38m long. The walls of the building are of well-laid thin sandstone slabs with the notable exception of the north east side which consists of a row of cast iron pillars, supporting a timber lintel, in three sections, along the length of the building. The buildings are included within the scheduling and were surveyed in 1994 prior to their conversion to modern workshop units and interpretative centre. The remains of the Rampgill dressing floors are considered to survive as buried deposits to the north west of the level entrance and are included within the scheduling. Approximately 220m north east of Rampgill Level are the earthwork and buried remains of Brewery Shaft and an associated spoil tip which was sunk to provide ventilation for this level. It is included in the scheduling, within a second area of protection, to preserve its relationship with Rampgill Level. A small stamp mill lies immediately south east of the Rampgill Level and contains the remains of the timber framework for a set of Cornish stamps (iron-shod timbers vertically operated by cams on a water-powered axle which were used to pulverise ore into finer particles) introduced in 1796. The framework survives as a substantial timber and stone base, from which two timber posts project upwards, with the remains of the inlet funnel and outlet chute. A ruined single storey building, measuring 7.7m by 3.3m, lies on the north side. The stamps themselves were removed to a museum in the early 1980s. In addition, a waste tip of fine material lies a short distance to the west, a wheelpit, measuring 0.95m wide by 6.15m long, is visible to the south east, and numerous culverts cross the site. The remainder of the stamps area has been affected by later reprocessing though it is considered to retain important buried remains and is thus included within the scheduling. The site of the Nenthead smelting is located a short distance south east of the stamps area. The first mill was built in 1737 but redesigned in 1745 when the London Lead Company purchased the site. Most of the smelting

buildings were intact until about 1970 when much of the site was demolished for its building material. However, a number of structures remain and three buildings survive largely intact. The most notable survival is the spine wall, 1.7m thick and surviving up to 6.4m high, which carried the flue from the hearths and furnaces. Three arched passageways through the wall remain together with many structural features. The flue for the smelting, which survives as two parallel banks of rubble for much of its length, extends 1.1km south eastwards to the collapsed remains of a chimney. In 1843 a Stagg condenser was added, powered by a large waterwheel. Significant remains of the condenser, which was used to precipitate lead oxide in water, are thought to survive as buried features and its site is marked on the surface by a rectangular spread of rubble 20m long by 10m wide. The associated wheelpit, measuring 16m by 2m by 5m deep, survives well and is of coursed squared sandstone rubble with an unusual upward extension and a crenulated top to the south wall. South west of the smelting, a cobbled and stone flagged surface marks the position of a building. This is thought to be the remains of the early, pre-London Lead Company smelting. A ruined series of bingsteads (storage bays for lead ore) are situated just to the east. The assay house, situated west of the smelting, is the best preserved building within the site. It is of two storeys, with a slabstone hipped roof and a large central chimney, and measures 15m by 6m externally. The two buildings south of the assay house are considered to have been mineshops (lodging houses for miners). The site of the Old Carrs Level, worked from before 1737 until at least 1772, lies 150m south east of the smelting. The site includes the Old Carrs Level arched portal which is collapsed for the first 4m, two spoil tips and a building known as Carr's Shop. The building is single storey with surviving roof timbers and an internal fireplace. Evidence of an associated tramway shown on a mid-19th century map will survive as buried deposits. The monument also includes the surface remains of mining near Firestone Level, NNE of the smelting. The roughly coursed arched portal of the level survives and measures 1.3m wide by 2m high. The area below the level includes a large sub-rectangular spoil tip, measuring approximately 90m by 50m, situated within an area of shafts. A continuous line of shafts follows the Brigal Burn Vein across the modern road above the level and extends as far as Low Whimsey near Scaleburn Bridge on the modern Allenheads road. This area forms part of a continuation of the core area of mining features and is included within the scheduling. Mining features beyond the road north eastwards to High Whimsey and also from High Whimsey to Slate Hill, are less well preserved and do not add significantly to the understanding of the monument and are thus not included within the scheduling. The Smallcleugh dressing floors are situated south east of the smelting, on the right bank of the Nent Burn. The remains of three buildings are visible, together with the remains of other ruined structures including a wheelpit, machine bed and settling tanks. The west edge of the dressing floors, which overlook the burn, contains a number of timber and stone structures exposed up to 1m below modern ground surface. This indicates that the extensive spreads of dressing wastes retain additional buried features. The remains of a core area of the Shawside workings on the left bank of the Nent Burn, to the west of the Smallcleugh dressing floors, are also included within the scheduling. The workings, which includes shafts, levels and small hushes, are considered to have 17th century origins. The mining features, which extend south eastward to the confluence of Old Carr Burns, Middle Cleugh and Long Cleugh Burns which merge to form the River Nent, also includes the remains of three buildings, a small holding dam, large spoil tips and a well preserved stone lined leat to the south west. The monument also includes the remains of the Middlecleugh mine. The level, begun soon after 1758, is situated near the confluence Middle Cleugh and Long Cleugh Burns. The portal is now buried though its location can be located at the end of a road way crossing the Middle Cleugh Burn, which flows through a culvert at this point. The remains of the Middlecleugh mineshop, which survives to eaves height on three sides, lies to the

north west. A second building lies to the north at the confluence of the Nent and Old Carr Burns. The building, which is still roofed, was built by the Veille Montagne Zinc Company to house an hydraulic compressor fed by a substantial pipeway from Perry's Dam 1km to the south. A sample length of the pipeway, which lies on top of a substantial spoil tip to the south, is included within the scheduling. A bridge situated to the west of the compressor house contains an unusual sluicing arrangement and is also included within the scheduling. Extensive clusters of shaft mining features situated south of Middle Cleugh, including Coulsons Level, Atkins Level and Hopes Shaft, many of which show signs of later reworking for fluorspar, do not significantly add to the understanding of the monument and are not included within the scheduling. The remains of an extensive water management system, namely leats, culverts, and the well preserved remains of substantial dams are also included in the scheduling. The Smallcleugh Reservoir, built in 1820, lies south east of the smelt mill above the Smallcleugh dressing floors and was fed by a leat from the Rampgill Burn and later, at least in part, by a leat from the Firestone Level. The pond is retained behind a crescent-shaped flat-topped earthen dam, which stands 4m high, with sluicing arrangement at the north end and an overflow arrangement at the south end. Two smaller dams at Low Capelcleugh Level and to the east of the Rampgill workshops are also included within the scheduling. Perry's Dam situated 1.3km to the south, which supplied the later hydraulic system, is the subject of a separate scheduling. The south west part of the monument is formed by the Dowgang hush. Its origin is unknown though it is known to have been working in 1773. A number of shafts and at least two levels lie along its course. The monument also includes the remains of transport features such as tramways and roadways. It is thought that part of the Rampgill Level and Old Carrs Level tramways, which linked the levels with their dressing floors, will survive as buried deposit. The remains of the tramway connecting the Smallcleugh Level with its dressing floor on the opposite side of the burn survives as a number of ruined revetments. In addition, the London Lead Company constructed a number of roadways within the area of protection, many of which remain in use, such as the main track leading through the site. All drystone boundary walls, fenceposts, road surfaces and modern service features are excluded from the scheduling, although the ground beneath them is included.

MAP EXTRACT The site of the monument is shown on the attached map extract.

Selected Sources

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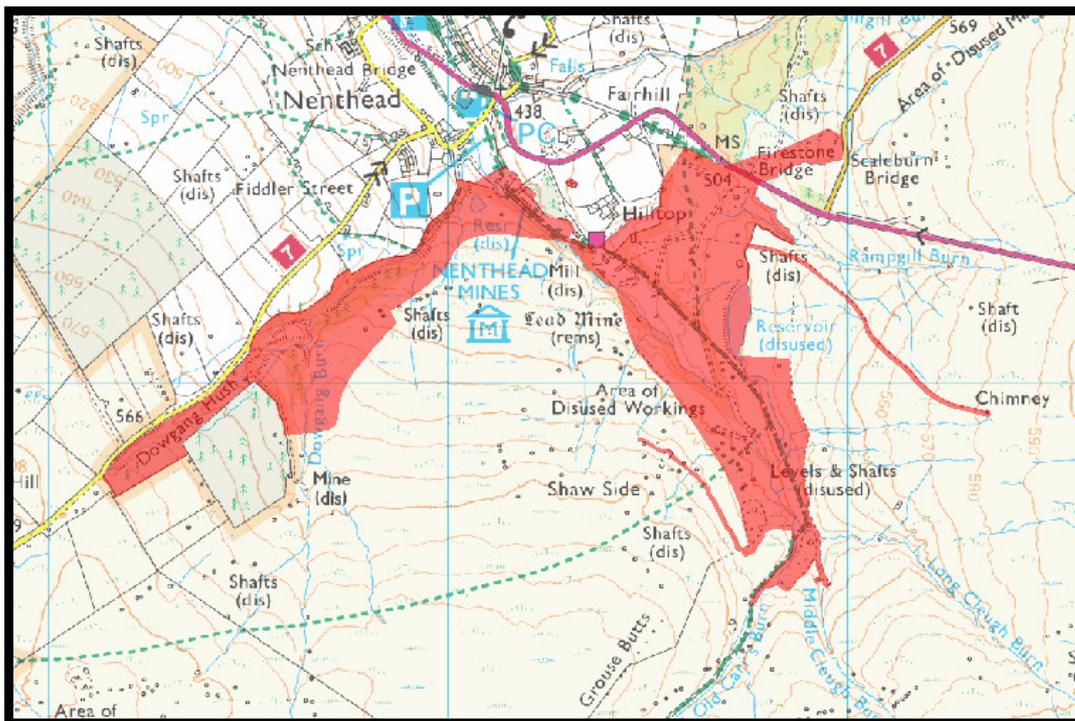
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