

Snailbeach Lead Mine Shropshire: MANAGEMENT STRATEGY

Volume I: Understanding and Significance



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SNAILBEACH LEAD MINE, SHROPSHIRE: MANAGEMENT STRATEGY

Volume 1: Understanding and Significance

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Acronyms

BAP: Biodiversity Action Plan
CPAT: Clwyd-Powys Archaeological Trust
EH: English Heritage
LEN: List Entry Number
LUAU: Lancaster University Archaeology Unit
NAMHO: National Association of Mining History Organisations
NE: Natural England
NMR: National Monuments Record
NNR: National Nature Reserve
SA: Shropshire Archives
SC: Shropshire Council
SAC: Special Area of Conservation
SAM: Scheduled Ancient Monument
SCMC: Shropshire Caving and Mining Club
SDR: Snailbeach District Railway
SMT: Shropshire Mines Trust
SMTL: Shropshire Mines Trust Limited
SMR: Sites and Monuments Record
SSSI: Site of Special Scientific Interest
UKBAP: United Kingdom Biodiversity Action Plan

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CPAT: Clwyd-Powys Archaeological Trust

EH: English Heritage

LUAU: Lancaster University Archaeological Unit

NE: Natural England

OS: Ordnance Survey

SA: Shropshire Archives

SMTL: Shropshire Mines Trust Ltd

Note: All English Heritage photographs taken by the author between May 2010 and August 2011

I. THE NEED FOR A MANAGEMENT STRATEGY

I.1. INTRODUCTION

There are a range of organisations involved with the management of Snailbeach Lead Mine, a complex multi-phased site with historic and natural environment significance and a range of diverse designations. The lead mine is also within a residential settlement and as such any management decisions may directly affect the environment of those living there. This strategy focuses on a scheduled area of around 12ha. most of which is owned by Shropshire Council and jointly managed with the Shropshire Mines Trust Ltd (SMTL), a voluntary organisation. A five-year Management Plan was written in 2006 and actively used by Shropshire Council's Parks and Countryside Sites team; this is now out of date and the production of an updated management strategy at this time provides the opportunity to take forward and ensure communication between existing partnerships, bring together a baseline of information for future research, and identify policies and a management programme to ensure a secure future for the mine site.

I.2. AIMS

A conservation management plan is:

- A document which sets out the significance of a place, defines the relevant conservation issues and establishes policies to sustain and where appropriate reveal and reinforce the place's values.
- A framework for decision-making that informs and guides proposals for the place's maintenance, repair, presentation, development and management.
- A living document that should be regularly reviewed and updated
- A document which involves consultation with internal and external stakeholders.
- A document which is formally adopted by those concerned with the care and management of the place.¹

This 'Management Strategy' is in all but name a conservation management plan and is based on guidelines for such plans as produced by the Heritage Lottery Fund (HLF). Its structure is based on a model laid out in *Informed Conservation* by Kate Clark in 2001.

The overarching aim of the management strategy is to achieve the appropriate conservation of Snailbeach Lead Mine.

This will be done by:

1. Understanding the history and significance of the site
2. Understanding the management issues of the site
3. Identifying policies for the site's management
4. Identifying a programme of management activity
5. Promoting best practice for management planning for related sites in the area.

In order to achieve these aims the strategy will:

¹ English Heritage property management protocol, 2007.

1. Provide an information base line
2. Provide a bibliography of relevant documents
3. Be adopted by stakeholders
4. Be maintained, reviewed and updated by Shropshire Council in agreement with the stakeholders.

Other uses for the management strategy:

- Management plans are often a pre-requisition for grant aid, and as such this strategy will be useful for future applications by Shropshire Council, particularly to the HLF.
- Provide information to the Shropshire Hills Area of Outstanding Natural Beauty (AONB) Landscape Partnership project.
- Act as a baseline of information for wider research into lead mining, e.g. such as by the National Association of Mining History Organisations (NAMHO).

The management strategy is not a condition survey nor does it provide specifications for works. This is covered in a separate document – Shropshire Council, Snailbeach Scheduled Monument, Quadrennial Survey, May 2011. The main task of the management strategy is to provide a list - in Volume 2 - of future desirable works informed by the Quadrennial Survey, and which, if undertaken, should be informed by the significance laid out in Volume 1.

1.3. PREVIOUS MANAGEMENT STUDIES

A comprehensive archaeological survey of the site was undertaken by Lancaster University Archaeology Unit (LUAU) in December 1989, for identification, scheduling recommendations and to produce an outline management plan defining topographical zones with differing areas of archaeological restraint.²

In 2006 the first Management Plan for the site was written by an ecological consultant for Shropshire County Council.³ The Plan did not refer to the 1990 report or attempt to introduce a holistic approach to the site's management as this was not required by the Shropshire Council Parks and Countryside Sites team. It has been successfully used by the team and this management strategy will update and maintain its management policies and strategies.

There is a wealth of information available on the history of Snailbeach Lead Mine, as outlined in *Section 2.4.1*. To provide a succinct strategy, historic information will be kept to a minimum, with references made to secondary material, much of which derives from the 1990 LUAU report.⁴ Other sources of information are listed in an extensive bibliography at the end of this document.

² Lancaster University Archaeology Unit (Trueman, M. & Gill, M.C.) Snailbeach Lead Mine Stage II Study – Archaeological Survey, 2 vols (1990).

³ EcoTech ecological consultancy compiled a five-year Management Plan for Snailbeach Lead Mine as a Countryside Heritage site in 2006. The plan makes use of the Conservation Management System (a numerical system).

⁴ Reference copies of the LUAU report are available from English Heritage (West Midlands Region), Shropshire Council Historic Environment Record (Shirehall, Shrewsbury), and Shropshire Archives (Castle Gates, Shrewsbury).

2. CHARACTERISING THE DEFINED AREA

2.1. DEFINITION OF THE STUDY AREA

The area covered by the management strategy is defined by the scheduled areas of Snailbeach Lead Mine and Snailbeach New Smeltnill [Fig. 1]. Whilst these statutory definitions provide a management focus, this selection does not exclude land or features immediately outside these boundaries. The subterranean archaeology of the mine is not covered by this strategy, but reference is made in Appendix 5 to its potential. A description of the underground workings can be found in other sources.⁵ Individual residential buildings are also not covered, although some (such as No.4 Snailbeach and the Mine Count House) enhance the significance of the mine's management and social history. As detailed below, the Snailbeach site is subject to a number of historic and natural environment designations which should be carefully considered in any management proposals.

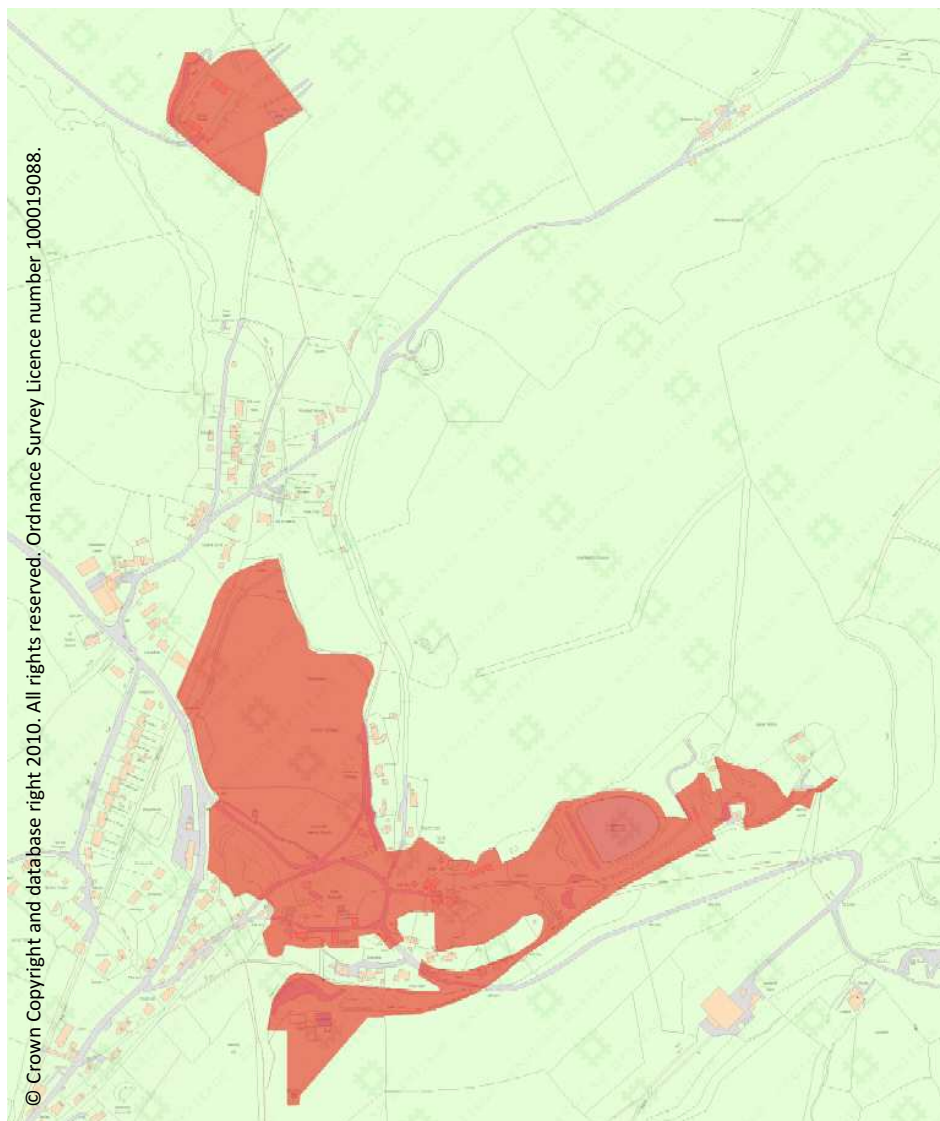


Fig. 1: Snailbeach Lead Mine and Smeltnill – scheduled areas

⁵ Shaw (2009), pp.85-86 and Shropshire Mines Trust *Snailbeach Lead Mine, Shropshire* (2008). Shropshire Caving and Mining Club (SCMC) hold records of underground exploration.

Other sites within a four mile radius which are important to the contextual understanding of Snailbeach Lead Mine include Tankerville Lead Mine, the Bog, Pontesbury Engine House and the deserted settlements of Blakemoorgate, Blakemoorflat and The Paddocks. It is not proposed to cover these sites in the strategy, but as they are intrinsically part of the South Shropshire lead mining area they should be considered and included where appropriate when managing tourism or interpretation in the area.⁶

2.2. OWNERSHIP AND CURRENT LAND USE

2.2.1. Historic ownership

In 1086 the manor of Minsterley was part of the barony of Caus, under the Corbet family until 1347 when the barony was divided and passed to the Earls of Stafford, and in 1573 the manors were sold to Sir Rowland Hayward. The second phase of ownership was when the mine was in use: in 1766 the mine is recorded as part of Lord Weymouth's land and in 1838 it was owned by the Marquess of Bath, at which time employment would have been shared between 'adventures' in mining, and agriculture. The mine workings were leased out, the Snailbeach Mining Company being formed in 1783, becoming a Limited Company in 1867, and forming into Snailbeach Lead Mining Company Limited in 1885. Between 1900 and 1940 the Halvans Company operated at the mine, being the sole operator in the interwar years. The mine was acquired by Joseph Roberts in 1944, and barites mining continued until 1955. Roberts is recorded as re-working the spoil for spar and aggregate in the 1970s and 1980s.

2.2.2. Current ownership and management, land use and access

Today, the mine is partly in the parishes of Minsterley and Worthen with Shelve. The majority of the Snailbeach site was purchased by Shropshire County Council in 1991, and remains in the ownership of the local authority, now Shropshire Council [Appendix 1: Map 4]. Around 3ha. of the historic waste tip area - known as White Tip due to the nature of the calcite waste - is leased by the Council on a two-year licence for grazing. The mine area is a Countryside Heritage Site, a minor tourist attraction which encourages walking by several footpaths and rights of way crossing the site. Due to its biodiversity interest it is also a haven for nature enthusiasts, and its geological interest attracts fossicking. The site's main interest lies in its industrial archaeology and is widely known for that significance and interest.

Over time residential properties, probably initially owned by the Marquess of Bath, became privately owned. It is assumed that the residential buildings in Snailbeach and the land surrounding them, generally in use as domestic gardens, remain in private ownership and in most cases these dwellings are not within the scheduled area. Their management is not covered within this report, although their relationship to the development of the area should be considered; their management should be specifically considered under the controls of the Snailbeach Conservation Area.

The nature of the site allows free public access throughout the year, with no restrictions to the mine structures and features. Shropshire Mines Trust Ltd (SMTL) manages the site

⁶ Brief histories of other mines in the Shropshire ore field can be found in a variety of sources, including Brook & Allbutt (1973).

with Shropshire Council and opens the Visitor Centre on Sundays and Bank Holidays and organises underground and surface tours. Until recently the Trust have had a maintenance agreement with and overseen by the Council for undertaking grass cutting, basic vegetation and access management over most of the site, excluding the Reservoir and White Tip. The Shropshire Mines Trust owns most of the mining artefacts and documents on the site, loaning artefacts to SMTL for interpretation and research. SMTL have been the driving force behind the understanding of the site, and their work has increased public access and consequently contributed to the recognition of the need for informed management of the site. SMTL also own Tankerville Mine, and a written strategy to inform future management should be implemented there.

Snailbeach New Smeltnill is in private ownership, and there is no public right of way across the site or to the historic buildings. The former Smeltnill mine office (undesigned and not included in this report) has been converted into the owner's house, the monument is within the owner's garden, and the slag mill building is used for storage.

2.3. PHYSICAL CHARACTER

The historic settlement of Snailbeach occupies a valley cut into the side of the Stiperstones edge, narrowing to the east with steep sides to the north and south and opening out into the flatter lands of the Hope Valley to the west. There are several such valleys – or 'beaches' – along the sides of the Stiperstones, for example Perkins Beach to the south, and the name derives from the word 'batch' meaning deep valley. Snailbeach is around 240m above sea level, and areas of surrounding higher ground are, respectively, Snailbeach Coppice to the north, Resting Hill to the south, and Lordshill to the south east. Further to the south east the land climbs to around 400m at the former miners' settlement of Blakemoorgate and onwards to the Stiperstones and the Devil's Chair.

Concentrated over c.12ha, Snailbeach Lead Mine is a centralised, complex mine, with remains from the late eighteenth to mid twentieth century. Much of the site's topography is a direct result of mining operations, with mine buildings and the residential settlement connected to the development of mining processes and the layout of a tramway and access roads. This contributes to the sense of the place being a historic landscape; as described in the LUAU report 'landscapes are usually complex palimpsests'.⁷

The northern area of the site is perhaps the most landscaped as the location of the two main waste tips. Historically, and until 1991, Snailbeach was largely characterised by the whiteness of the northerly waste tip, called on occasion an eyesore. A reclamation project as part of the Derelict Land Reclamation Scheme was undertaken in two phases between 1993 and 1996, and included stabilising shallow workings and infilling potentially dangerous areas (namely mineshaft openings); reshaping and covering the White Tip to 'isolate the main source of contamination'; and planting shrubs around the margins of and on the White Tip. The standing buildings – many of which were in a dangerous condition – were stabilised

⁷ LUAU Vol.1, p.31.

between 1990 and 1997.⁸ These works have undoubtedly changed the character of the mining area, especially the dramatic character of the White Tip [Figs 2 & 3].

The core area [Appendix I: Map 5] - the main processing area - is generally flat with low-profile undulations on the dressing floor. Black Tom, a secondary shaft to the east of the area, is set on a slight rise, and there is naturally a drop in level to the reservoir edge. The topography rises to the north-east of the reservoir, dropping down to Perkins Level at the far eastern extent of the site, and rises dramatically to the south behind the compressor house to the winding and pumping engine houses, inclined plane, and chimney on Resting Hill.⁹ Many adits punctuate the site with dark entrances and changes in temperature on approach.



Fig. 2: The White Tip before reclamation work in May 1992 (Clwyd Powys Archaeological Trust - CPAT)

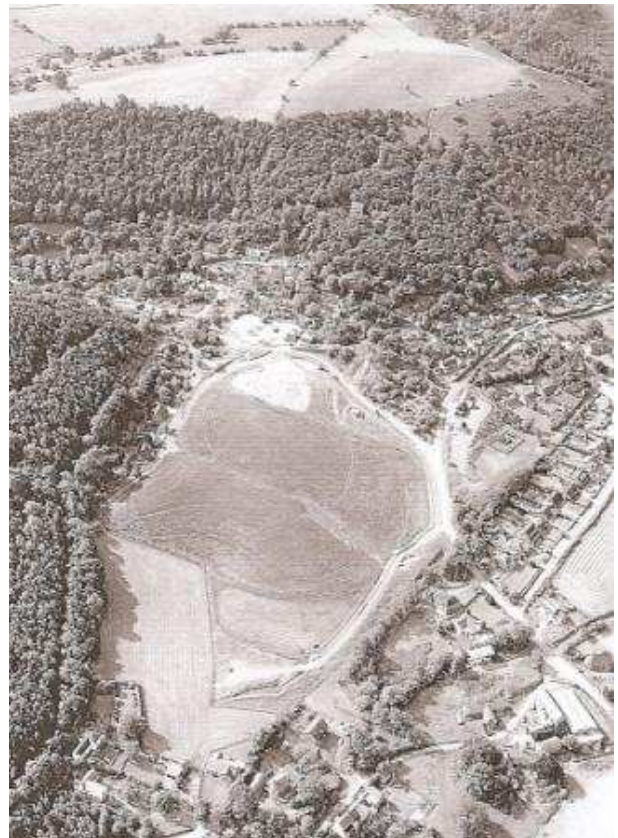


Fig. 3: The White Tip after reclamation work in July 1996 (CPAT)

The varied topography is enhanced by vegetation and mature trees [Fig.4]. This gives the site a unique wild and rural character, with structures glimpsed and slowly emerging from woodland and providing a haven for animal and plant life. Vegetation on the dressing floor and spoil tips also helps control human erosion, deterring over-use by off-road cycling and therefore managing damage to the scheduled monument. Conversely however, vegetation has also affected the structures of several buildings, historically contributing to their

⁸ Further information on the management of the site in the period up to 2006 can be found in the EcoTech Management Plan (2006), p.25.

⁹ This hill is often incorrectly named Lordshill, which is to the east near Chapel Shaft.

collapse. Careful vegetation management is required to ensure that this does not continue, and to also allow views to features such as the Resting Hill chimney.



Fig. 4: The core area of Snailbeach mine from the north east

The geological structure of the Stiperstones area is the outcome of repeated folding, faulting and denudation due to successive earth movements, and the history of mineralisation is intimately bound up with these changes. It is crucial to understanding how the mine developed and this has been fully analysed in several reports¹⁰. The various minerals mined at Snailbeach and across the Shropshire ore field occur in veins between 1cm and 3.5m thick, located in fractures and faults orientated NW to SE in the Snailbeach area. The veins are formed by hot aqueous solutions and vapours rich in dissolved minerals, originating from saline seawater circulating in crustal rocks. These solutions (brines) pass through the crust, gaining more minerals, and are then heated by igneous bodies until they rise above the heat source and are forced into weaknesses in crustal rocks near the surface, forming veins. The brines at Snailbeach are thought to be date to the Carboniferous age. The mineral veins at Snailbeach run through the Mytton Flags, an Ordovician mudstone, and the chemistry of rock types determined whether veins were formed within them. No veins

¹⁰ See Wardell Armstrong 1988, vol.I, ch.3, pp.13-20 and vol.III, plates 3.1-3.3 for a full description; Wardell Armstrong 1988, vol.II, appendix 3b for geological references; and Wardell Armstrong/LUAU 1990, Voll, pp.16-17 for a more concise description. The recommended source for understanding Shropshire's geology is P. Toghil *Geology of Shropshire* (2006).

occur in the Stiperstones quartzite which underlies the Mytton Flags, and any mining following a vein in the Mytton Flags was stopped when it reached the quartzite. This was often responsible for the rapid abandonment of mining areas, such as Chapel Shaft. The principal minerals in the veins were galena (lead sulphide), sphalerite (zinc sulphide) and barites (barium sulphate), sometimes called heavy spar. These minerals are found in association with calcite and quartz, gangue minerals - of no economic use - which were left as white spoil tips.

The Mytton Flags mudstone was the primary building material in the Stiperstones area, due to a lack of competing materials. The railways however brought slate, brick and other materials from elsewhere, and therefore late nineteenth-century buildings begin to display a varied palette of materials.

The importance of the geological make-up of Snailbeach has resulted in its designation as a Site of Special Scientific Interest (SSSI) and also as a Local Geological Site (LGS).

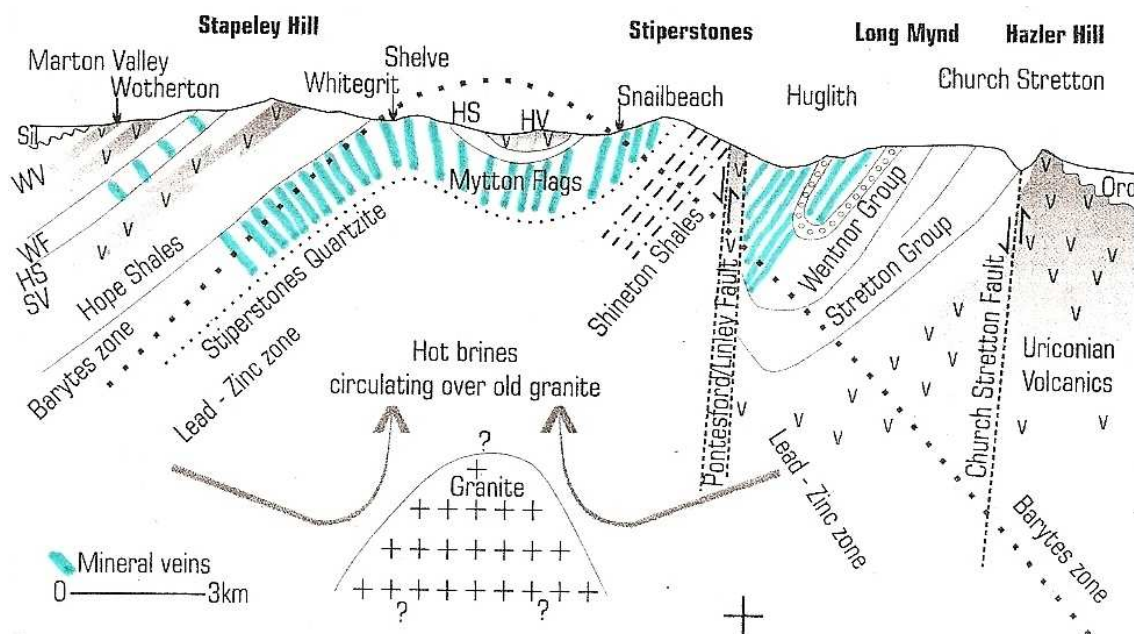


Fig.5: Cross-section diagram showing mineralisation in the Shelfe-Long Mynd area (from P. Toghil Geology of Shropshire (2006), p.108.

2.4. DESIGNATIONS

The areas covered by the strategy - as shown in Fig.1 - contain the following designations which may require consideration in planning decisions:

- Two Scheduled Ancient Monuments (SAM) – Snailbeach Lead Mine and Snailbeach New Smeltnill
- Thirteen grade II listed buildings
- Snailbeach Conservation Area
- Shropshire Hills Area of Outstanding Natural Beauty (AONB)
- Snailbeach Mine Site Site of Special Scientific Interest (SSSI)
- The Stiperstones and Hollies Site of Special Scientific Interest (SSSI)
- The Stiperstones and Hollies Special Area of Conservation (SAC)

- County Wildlife Site
- Shropshire Hills Environmentally Sensitive Area (ESA)
- Stiperstones National Nature Reserve (NNR)
- Local Geological Site (LGS)

2.4.1. Historic environment

The Scheduled Ancient Monument and listed building descriptions are included in Appendix 2. A Conservation Area Appraisal was undertaken in 1983 and is available from the Historic Environment Team at Shropshire Council [Appendix 1: Map 4].

Initial recognition

Perhaps the earliest historic report on the Snailbeach Lead Mine was published in the *Illustrated London News* in October 1856 – ‘An excursion to the Roman lead mines in the parish of Shelve’. The Pontesbury smelters were described in a detailed and illustrated article by Moissenet titled ‘Traitement de la Galene au Tour Gallois’ in the *Annales des Mines* in 1862. Although this was intended as a technical rather than archaeological or historic record of the smelters it is a useful source of information to supplement surviving built evidence, and also highlights the importance and influence British (and indeed Salopian) lead mining had in Europe.

It was not until the post-war period that the mining site was considered in any detail; the Ministry of Town and Country Planning reported *The Problem of Snailbeach* in 1945, namely the condemnation of houses due to their poor condition, the White Tip as a ‘blot on the landscape’ and the ‘foreignness’ of Minsterley to Snailbeach – emigration from one village to the other was apparently rare then. A survey of accessible mining sites in Shropshire was undertaken in 1960, leading to the formation of the Shropshire Caving and Mining Club (SCMC) in 1961. Interest in the site was paid by R.V. Davis in 1967, who wrote *A Brief Account of the Geology, History and Mechanisation of the Snailbeach Mine*, followed in 1973 by Brook & Allbutt’s *The Lead Mines of Shropshire*, possibly the first publication to thoroughly analyse the mining activities in South Shropshire.

It was then not until 1977 that the first concerns over the condition of the mining structures were published; this recorded an inspection by South Shropshire District Council of various mine structures at the White Gritt, Gravels, Tankerville and Snailbeach areas and included photographs of building in various ruinous states. Perhaps as a result of this, articles were published the following year by I. J. Brown and M. Newton; the former was published in the SCMC journal and titled *An Attempt to Save the Snailbeach Mining Area from Land Reclamation* suggesting that the SCMC were by then aware of the importance of both the underground and surface archaeology at Snailbeach. A further account by J. A. Heathcote (SCMC) in 1979 noted a liaison with South Shropshire District Council over the conservation of the mining remains. In the late 1970s interest was also paid to the Snailbeach District Railway (SDR).

The second half of the 1980s produced several reports and publications on the mines. A project proposal by a student at the Ironbridge Institute in 1984 makes comparisons of significance with lead mining sites in the Peak District, and suggests the formation of a trust and the potential for education and interpretation. At around this time the first known

survey drawings were made of the ruinous structures, by N. Chapman. Although not archaeologically detailed, they provide evidence beyond photographs of the condition of the buildings in the early 1980s.

Building and other surveys

The first commissioned report on the site was by Ove Arup in 1985. This was part of a three-phase study, supplemented during its ten year course by archaeological surveys (such as of the Blacksmith's Shop in 1992) and watching briefs. A Lancaster University Archaeology Unit (LUAU) report published in 1990 provided the background and evidence to suggest the site for scheduling (most of the structures had been listed in the mid 1980s), leading to a series of 'Step' reports by English Heritage and the resulting designation in 1986. The 1990 LUAU report is still considered the most thorough analysis of the archaeological area, and whilst it is outdated and in some cases has been superseded by later investigations it should be the first reference point for anyone considering works involving the historic environment at Snailbeach. Further archaeological investigations were carried out in the late 1990s to inform conservation and consolidation work to the crusher house and winding and pumping engine houses. Much was written in this period concerning the industrial archaeology of Shropshire, including Michael Shaw's *The Lead and Barytes Mines of Shropshire* (2009).

In summary, the following archaeological investigative surveys have been carried out:

- Retaining walls and bridge abutments (1991)
- Blacksmith's Shop (1992)
- Archaeological monitoring of a large area (1993)
- Watching brief of wider site (1995)
- Crusher House and Manager's House; watching brief and recording (1995)
- Powder Magazine (1995)
- New engine shaft area (1997)

Additional inspections were carried out under the phased study of the adits and flues, and the toxicity of soils and water. References to all of the above can be found in *Sources* at the end of this document.

Recent management

As Snailbeach is a Scheduled Monument it is the responsibility of landowners to seek consent from English Heritage for works to the monument under the Ancient Monuments and Archaeological Areas Act 1979 (as amended). Listed building consent will also be required for works to such buildings, and as they are all grade II listed this should be discussed and sought from Shropshire Council. It should be noted that many of the mine buildings are both listed and scheduled and in such cases the scheduled status takes precedent. Several English Heritage Section 17 Management Agreements and successful Heritage Lottery Fund applications over the last ten years have enabled management and access works at the site, resulting in ongoing vegetation management - much of which has been undertaken by SMTL and their volunteers; the restoration of the Miners' Dry buildings; the reinstatement of features such as George's Shaft headgear; and the compilation of an

education pack and other interpretative material. Works enabled by a further grant funding are currently ongoing (summer 2011) and these are mentioned below where relevant; the latter is being part-funded by a Section 17 Management Agreement and additional funds from Shropshire Council and SMTL. The New Smeltmill site has also received Management Agreement funding which has recently facilitated repairs to the slagmill roof and extensive vegetation clearance.

2.4.2. Natural environment

The designation of parts of the Snailbeach site as a SAC, SSSI, County Wildlife Site, and its inclusion in the Shropshire Hills ESA and the Stiperstones NNR highlight the importance of the site for reasons other than its archaeological interest.

Geology

The geology and geological processes of the Snailbeach area are the principal reasons for mining to have taken place and consequently the existence of historic remains which inform our understanding of the place and the past (see Section 2.3.). The Reclamation Scheme removed a substantial part of the physical and visual evidence of lead mining, which had been arguably as important as a landscape feature as evidence of minerals in the area as the veins were mined out. Small areas of processed mineral remain close to White Tip, and Snailbeach Mine SSSI is designated for its geological importance, separate from the Stiperstones and Hollies SSSI.

Vegetation

The Stiperstones ridge is composed mostly of quartzite, giving poor acidic soils and heathland, with further acidic soil caused by underlying Mytton Flags; miners would add calcite to the soil (readily available as a waste product of lead extraction) to try and neutralise it for vegetable production, resulting in small areas of hay meadow at Blakemoorgate. The waste products from mining activity increased the toxicity of the ground on the White Tip and dressing floors, with high zinc levels, unstable ground and dry conditions preventing plant colonisation. As part of the Derelict Land Reclamation Scheme, in 1995-6 Shropshire County Council covered the White Tip with up to one metre of subsoil, and, in appropriate areas, seeded with a wild flower mix. This, and natural regeneration, has attracted a range of wildlife. Flowering plants such as harebell (*campanula rotundifolia*) and common spotted orchid (*dactylorhiza fuchsii*) were observed in summer 2011 growing on the White Tip; the former are native to dry, nutrient-poor areas and are able to colonise stony places and both prefer calcareous ground. Conversely, some of this planting has impacted on the stability and interpretation of the historic monument. A list of local Biodiversity Action Plan (BAP) species is included at Appendix 3.

Biodiversity

Notable wildlife identified at Snailbeach includes grayling butterfly (*hipparchia semele*), common dormouse (*muscardinus avellanarius*), and several different bat species (Natterer's, Brown Long-Eared, Lesser Horseshoe and Daubenton's). The disused shafts at Snailbeach provide ideal habitat for bats. Following the land reclamation scheme in 1991, it was

recommended that most of the shafts were infilled; the presence of bats, as highlighted by a survey by the Shropshire Bat Group in 1993, prevented this. At the time a population of lesser horseshoe bats was discovered at Sheep Shaft near Chapel Shaft, probably associated with a known summer roost nearby. Bats use the shafts for hibernation and socialising, the damp, quiet and cool environment being ideal for reducing metabolism during the hibernation season (November-March). Allowing the shafts to remain open has not impacted on the bat population; with their main predators being cats and owls the shelter provided by the shafts has seen an increase in numbers between 1993 and 2008. Bats and their roosts are legally protected and it is a criminal offence to knowingly disturb a bat in its roost; the current relevant legislation is the Wildlife and Countryside Act (1981) (as amended); the Countryside and Rights of Way Act, 2000; the Natural Environment and Rural Communities Act (NERC, 2006); and by the Conservation of Habitats and Species Regulations (2010).¹¹ Moths and insects also use the shafts as shelter. Herald moth (*scoliopteryx libatrix*), tissue moth (*triphosa dubitata*), and cave spiders (*meta merianae*) have all been identified. A list of sightings of protected species over the last c.30 years is included at Appendix 3.

Recent management

Under the Countryside and Rights of Way Act 2000, Shropshire Council has a statutory duty to manage the Snailbeach Mine SSSI towards favourable condition (it is currently regarded as 'unfavourable, recovering'). Under the Natural Environment and Rural Communities Act 2000 there is a duty on statutory bodies to ensure due regard to the conservation of biodiversity: 'every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'. As such, the 2006 Management Plan has provided a framework for the management of the Snailbeach Countryside Heritage Site for the past five years. Undertaken by an ecological consultancy, the plan focuses very much on the biodiversity and natural environment, whilst taking into account the heritage interest to a lesser degree. The plan is effective for the management of the site by Shropshire Council's countryside rangers, and its projects and prescriptions have been considered in this plan, where relevant to the upcoming five-year period (2011-16). The 2006 Management Plan is structured around seven key features, among which are upland oak woodland, bats and bat roosts, and notable invertebrates¹². Each feature is described, with reference to animal life (e.g. dormice) and the impact of vegetation on archaeological features.

The following summary of natural environment designation interests has been included to highlight the national importance of the Stiperstones area, of which Snailbeach is an integral part. As such, these designations will require consideration in planning or development proposals.

¹¹ More information on bats and the law and the legal and conservation status of UK bat species can be found on the Bat Conservation Trust website http://www.bats.org.uk/pages/bats_and_the_law.html

¹² The other four are industrial heritage, geology, public access, interpretation and education, and health and safety (EcoTech MP, 2006, pp.7-8).

Shropshire Hills Area of Outstanding Natural Beauty (AONB) [Appendix 1: Map 5]

The Shropshire Hills Area of Outstanding Natural Beauty was designated in 1958 and covers an area of 802 square kilometers. It is nationally important, and its special qualities are the diversity and contrast of its landscape, farmland, woods and rivers, geology, wildlife and heritage, plus scenic quality and views, tranquillity, and culture. The diverse landscape is created by varied geology, and the Shropshire Hills provide a dramatic link between the Midlands and the Welsh mountains. The built heritage reflects local materials from the landscape... Former mining sites, often associated with haphazard 'squatter' settlement with small enclosures encroaching onto common land, are found especially around the Stiperstones at Snailbeach and the Bog.

<http://www.shropshirehillsaonb.co.uk/about-the-aonb/>

Sites of Special Scientific Interest (SSSI) [Appendix 1: Maps 6 & 7; Appendix 2: SSSI citations]

- Snailbeach Mine SSSI
 - Condition (2008): unfavourable recovering
- The Stiperstones and the Hollies SSSI
 - Unit 51 is within the Snailbeach Lead Mine scheduled area.
 - This SSSI is notable for both its geological and biological interest.
 - Condition (2008): unfavourable recovering

Source: <http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/sssi/default.aspx>

Any management should take account of Natural England's guidance for owners and managers *Sites of Special Scientific Interest: England's special geological and wildlife sites* (2009). More information for owners including the SSSI consent procedure is available on the Natural England website:

<http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/sssi/owneroccupierinfo.aspx>
[x](#)

The Stiperstones and The Hollies Special Area of Conservation (SAC)¹³

[Appendix 1: Map 8]

"A SAC is a '...strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended)'...This site in central Britain is an example of European dry heaths that contains features transitional between lowland heathland and upland heather moorland."

Annex I habitats are present as a qualifying feature, but not a primary reason for selection of this site.

<http://www.sssi.naturalengland.org.uk/special/sssi/glossary.cfm#citation>

County Wildlife Site

"These are areas identified and selected locally for their nature conservation value and include threatened habitats and species within a national, regional and local context, making them some of our most valuable urban and rural wildlife areas. The decision to designate a Wildlife Site is taken by a panel of conservationists including a representative of Natural England, Shropshire County Council's ecologist and Shropshire Wildlife Trust staff. The designation is formally made and the landowner informed by the Wildlife Trust."

<http://www.shropshirewildlifetrust.org.uk/WildShropshire/Wildlife+Sites>

Shropshire Hills Environmentally Sensitive Area (ESA)

“The Shropshire Hills ESA covers an area of 38,500 ha in the south of the County. The ESA comprises two discrete areas of land, each of which contains a core of upland habitat (at an altitude of 450-550 m)... A variety of habitats can be found in the ESA. Unenclosed moorland, semi-natural grassland, broad-leaved woodland, rivers and streams are amongst the important semi-natural habitats remaining... The area is rich in historical features dating back to prehistoric times... with the remains of more recent mining activities in the Cleve Hills and around Pennerley and Shelve... The ESA contains 26 Sites of Special Scientific Interest, the Stiperstones National Nature Reserve, and a range of local designations.”¹⁴

<http://www.naturalengland.org.uk/ourwork/farming/funding/closedchemes/esa/shropshirehills.aspx>

Stiperstones National Nature Reserve (NNR)

The scheduled area is outside of the Shropshire NNR but is within the 250m buffer zone that has been adopted.

“A wild and atmospheric landscape, with a geology of national significance. The Ordovician Stiperstones Quartzite, which makes up the ridge was shattered during the last ice age to create the jagged, boulder-strewn landscape seen today. Star species: Common lizard, brown hare and common frog live on the reserve and local birdlife includes curlew, red grouse and skylark, as well as raven, pied flycatcher and wood warbler in the wooded areas. Invertebrates range from armies of hairy wood ants, to magnificent green hairstreak butterflies and emperor moths.”¹⁵

<http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nnr/1006135.aspx>

Shropshire Council Countryside Heritage Site

<http://www.shropshire.gov.uk/countryside.nsf/open/8A5C4D9A10B85A1080256C9800435177>

Local Geological Site (LGS)

[formerly Regionally Important Geological Site (RIGS)]

Do not have any statutory status but are equal in quality to SSSIs. However, Features of Geological Conservation Importance [Snailbeach Mine – RIGS ID 0026] should be considered in the planning process alongside biodiversity.

Currently a number of different terms are used to describe sites of local importance, including Sites of Importance for Nature Conservation (SINCs), Sites of Nature Conservation Importance (SNCIs) and Regionally Important Geological Sites (RIGS), although Defra recommends the term Local Site - which may be sub-divided to Local Wildlife or Local Geological Site - should be used as a standard generic term to promote common understanding.

Defra provide guidance on the operation of local sites throughout the country (see Section 6).

The sites are selected on a local basis according to the following nationally agreed criteria:

- The value of a site for educational purposes in life-long learning
- The value of a site for study by both amateur and professional Earth scientists

¹⁴ ESA management schemes have been superseded by the Natural England Environmental Stewardship scheme.

¹⁵ Further information on its significance available at:

<http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nnr/stiperstoneswhatmakesitspecial.aspx>

- The historical value of a site in terms of important advances in Earth science knowledge, events or human exploitation
- The aesthetic value of a site in the landscape, particularly in relation to promoting public awareness and appreciation of Earth sciences.

<http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/localsites/default.aspx>

3. SIGNIFICANCE

3.1. SUMMARY OF HISTORIC DEVELOPMENT

The historical development of Snailbeach mine can be split into seven key phases, described in detail in the LUAU report and elsewhere:¹⁶

1. Early workings, including Roman (i.e. pre 18th-century)
2. Powys & Partners (1761-72)
3. Thomas Lovett: Snailbeach Mining Company (1782-1856)
4. Stephen and James Ray Eddy (1857-69, including major reorganisation 1862-9)
5. Henry Dennis (1870-84) – the most productive period
6. Snailbeach Lead Mining Company Ltd, and decline (1885-1911)
7. Post 1911

Roman exploitation of lead in Shropshire was made by the excavation of open trenches and shallow levels and shafts. A small number of Roman lead ingots have been found in South Shropshire, including near Bishops Castle and at Snailbeach in the late eighteenth century, most of which bear the inscription IMP HADRIANI AVG, dating them to 117-138 AD. Although South Shropshire, particularly the Shelve area, was continued to be mined using hand-driven processes, the first clear reference to substantial mining at Snailbeach comes from records in 1676 and 1686. Systematic working was begun by Thomas Powys in the 1760s and Thomas Lovett formed the Snailbeach Mining Company in 1783. Peak years in the 1850s produced 3,500 tonnes of ore annually; the first recorded loss was in 1884. Barites were mined from 1860 and from 1910 this became the mine's principal mining activity, with the main vein located at Perkin's Level and the Halvans Company being formed in 1900. Output fell in the twentieth century, with only 200 tonnes of lead produced in 1905. Pumping stopped in 1911 and the mine was flooded up to the 112 yard level. Black Tom Shaft continued in use into the twentieth century and several companies paid an interest in the mine in the inter-war years, but underground mining ceased in 1955. Reworking of the tips for pebble-dashing material continued in the 1970s and 80s.

A mine's archaeology is related to the way it worked, and the continual development of the site has provided a rich yet complex range of historic assets. This evolution also impacted on the mine's setting, imposing itself on a changing agricultural landscape and affecting settlement and land use. The relationship of the mine to the surrounding Shropshire ore field is of high importance. This significance is enhanced by the survival of related features, in particular the smelters and associated coalfield at Pontesbury. Whilst an analysis of these relationships is outside the scope of this document, references have been made where they enhance the significance of elements of the site.

3.2. COMPARATIVE ANALYSIS

There are around 251 lead-mining sites recognised as being of national importance (scheduled) in England, out of the 10,000 lead industry sites spanning 3,000 years that are estimated to survive. As noted in *Conservation Principles* the designation of a place is an indicator of the importance of its particular values.¹⁷ The scheduling of the Snailbeach mine

¹⁶ See Brook & Allbutt (1973), *Snailbeach Lead Mine, Shropshire* (2008) and Shaw (2009).

¹⁷ English Heritage *Conservation Principles* (2008), paragraphs 78-81, pp.39-40.

site in 1997 was a direct result of the LUAU survey and report, carried forward in the Monuments Protection Programme (MPP) reports. It was noted in the LUAU survey that a monument class description was not available for the lead industry; this continues to be the case and scheduling is carried out on a comparative basis using professional judgement and a sound understanding of the site and its context.¹⁸ This comparative system and the MPP scoring process were used by LUAU to analyse the importance of Snailbeach.¹⁹ An evaluation was made using a scoring system of one to three (where three equals high or good) for each of the criteria - survival, group value (association), potential, documentation (archaeological), documentation (historical), group value (clustering), diversity (features), and amenity value; Snailbeach scored 21 out of a possible score of 24 - its Monument Importance Value. The evaluation also described the core area as 'a major, coherent and concentrated mining landscape, of great academic and visual importance. Lordshill chimney and 'White Tips' of major scenic importance'.²⁰ It was thought of as being 'a particularly good example of its class, with a palimpsest of various periods...and a well preserved example of a highly centralised and well organised mid to late nineteenth century mine...the mine buildings and dumps, especially the White Tip, are major feature of the landscape, contrasting with the expanse of greenery from trees and fields. The way in which the mine evolved and was imposed on a changing industrial landscape is important to wider issues, such as settlement and land use'.²¹ Although the landscape character has changed at the site following reclamation works, this assessment continues to be correct in its assertion that Snailbeach is the best-preserved lead mine in Shropshire, its significance enhanced by the regional nature of the lead mining industry and the survival of associated features, namely the smelters at the New Smeltnall and Pontesbury. The designation of the area as a scheduled monument and the listing of many of the buildings have implications - including financial - for how the place should be managed, or conserved. Its protection contributes to ensuring that the values identified in the following section (4) are retained or enhanced.

The assertions of 'good example' and 'well preserved' are made more obvious upon visiting other lead-industry sites. Ultimately the high percentage of surviving structures, the purpose of many of which can still be read, contribute to the interpretation and understanding of the site and also to the role of the mine in the wider landscape. As part of the research for this management strategy the author visited Magpie Mine in Derbyshire and the Cwmystwyth and Bryntail Lead Mines in Powys.²²

¹⁸ The compilation of new Archaeological Selection Guides for designation is in process, September 2011.

¹⁹ As part of the MPP process, the LUAU report includes an in-depth assessment of other mining sites in Britain and will not be repeated here. The principal sites are listed as Cornwall and Devon, Somerset, Derbyshire, Wales (central and north east), Shropshire, Yorkshire, North Pennines (Alston Moor, East and West Allendale), Scotland, Isle of Man, and The Lake District (Vol.2, Appendix B). The context of lead mining in terms of mining history, geology and the non-ferrous mining industries is also assessed: Vol.1, pp.31-37.

²⁰ D. Cranstone. *Monuments Protection Programme Step 3 reports – Lead Mining* (1991). There is also more on the MMP process in LUAU (1990) Vol.1, pp.39-40.

²¹ LUAU (1990) Vol.1, p49.

²² A further comparative site is the Tamar Silver-Lead Mine at South Hooe in Devon. An archaeological assessment of this site was written by Cornwall Council in 2009 and also provides information for its conservation.

Magpie Mine is described in its scheduling as ‘one of the most complete examples of a Derbyshire Lead Mine’.²³ The mine was in production from c.1740, with mining on a grand scale commencing in the early 1800s. Despite fluctuations and legal disputes throughout the mine’s early years in the 1840s the mine began to flourish, operating under the influence of Cornish successes. Large-scale operations ceased in 1883 and the history of the mine mirrored that of Snailbeach into the twentieth century, with small-scale production and a renewed attempt to work in the mine in 1951. The latter involved the building of new structures, which survive and contrast with the earlier mine buildings, but the mine closed permanently in 1953. Magpie Mine never achieved substantial yields or profits due to difficulties with flooding and blockages in the levels, and legal difficulties. However, each period of activity has left evidence and this in itself is an interesting comparison to Snailbeach. Physically the mine site is similar in size and the surviving remains are comparable in construction and size, however there are fewer standing buildings than survive at Snailbeach. Whilst atypical of its type in Derbyshire, its recognition through scheduling underlines the national importance of complexes such as this. Elements of the site are managed through Natural England Environmental Stewardship.



Fig. 6: Magpie Mine, Sheldon, Derbyshire

Also in Derbyshire is Stone Edge Cupola near Chesterfield [Fig.7]. First built in c.1770 and rebuilt in 1811 with a slag mill and chimney (the oldest surviving industrial chimney in Britain, largely rebuilt in the 1970s). Rieuwerts describes the slag mill as a ‘barn like

²³ Magpie, Dirty Red Soil, Maypit, Horsesteps and Great Red Soil lead mines and a limekiln, 590m south east of Johnson Lane Farm. LEN: 1019490. Scheduled 1974. (Legacy UID: 29976).

structure'²⁴ and the scheduling states 'Stone Edge smelt mill is one of the best preserved examples in England of a reverberatory smelt mill, retaining the overall layout of smelt mill, slag hearth, condensing flue and chimney, and slag-washing area'²⁵, suggesting that it is comparatively similar to Snailbeach New Smeltpill. However, on visiting the monument very few standing or earthwork remains, aside from the chimney, were visible due to dense vegetation. The author would boldly suggest that despite its later date Snailbeach New Smeltpill has greater value and importance than Stone Edge Cupola due to the large amount of surviving evidence for the use and development of the site. This is reiterated in the LUAU report which states that the Snailbeach smelter is 'the best remaining example of a cupola mill' and the slagmill as 'one of the best preserved buildings of its kind in Britain', as reiterated in its Reasons for Designation (see Appendix 2).



Fig. 7: Stone Edge Cupola, Derbyshire

²⁴ Rieuwerts (2000), p.184.

²⁵ Stone Edge smelt mill at Moss Farm. LEN: 1020718. Scheduled 1973 (Legacy UID: 24983).

The smelting processes at Snailbeach are comparable to those at Grassington in Yorkshire [Fig.8], although here a reverberatory smelter was built much earlier, in 1792, to serve the lead mines on Grassington Moor. At the height of production the smelt mill contained two coal-fired reverberatory furnaces, a roasting furnace and a slag hearth. The mill was linked by a flue nearly 1600 metres long built in the 1850s, with two condensers in its course, terminating in an eighteen-metre high chimney.²⁶ The mill was built by the Duke of Devonshire and was run by James and Stephen Eddy between 1833 and 1882; the Eddys were at Snailbeach from 1857 to 1869 and probably brought successful processes from Yorkshire to Shropshire.



Fig. 8: Aerial photograph of Grassington smeltmill and chimney (www.outofoblivion.org.uk)

Cwmystwyth in Powys is an ancient mine which moved into modern practices in the mid nineteenth century. Its valley location made it well-suited for water-powered workings. The remains include the Copa Hill complex, the mining office and smithy, the dressing mill and Level Fawr. It was last worked in 1939-40. The site is described as ‘impressive’ and ‘important’ by LUAU. It is located on the mountain road to Aberystwyth and is an important component in the dramatic landscape of the area [Fig.9]. There is no interpretation at the site, but it is accessible by foot. Snailbeach has been purposefully reconfigured and is heavily vegetated, and therefore it is in complete contrast to Cwmystwyth which also has fewer structural remains.²⁷ Cwmystwyth was visited in 1858 by an engineer from Snailbeach, and such visits may have contributed to improvements at the mine.

²⁶ <http://www.outofoblivion.org.uk/record.asp?id=201> See also: English Heritage Research Department Report Series, no. 41-2009, Stewart Ainsworth and Andrew Burn *Grassington Lead Mines, North Yorkshire: A rapid assessment of the threats posed by road management and erosion: an archaeological investigation* (2009).

²⁷ <http://www.coflein.gov.uk/> NPRN for main entry: 33834. Also see LUAU Vol.2, pp.73-74.



Fig. 9: Cwmystwyth Mine, Pontrhydygroes, Powys

Bryntail Lead Mine near Llanidloes, Powys is in the guardianship of Cadw and is also situated in a dramatic location in the shadow of a mid-twentieth century dam [Fig.10]. The mine was worked from the late eighteenth century up to the 1860s, producing lead ore and barites. The surviving workings are largely nineteenth century and include three main shafts and a deep adit, well-preserved remains of an earthwork incline, substantial remains of buildings including structures which housed pumping and winding machinery, a barites mill, mine office, smithy and store building, a circular explosives magazine, wheelpits for winding and crushing machinery, ore bins, roasting ovens and precipitation tanks, jigger placements, a washing and picking floor area, buddles, and slime pits.²⁸ The precipitation tanks are particularly impressive. The mine was not included in the LUAU report comparative discussion. The archaeological remains and potential at this site could be said to be comparable to Snailbeach, and it is almost contemporary in date. The site is sympathetically interpreted and accessible. Links to the smelting process and to any local mining community are not apparent and parts of the site to the west may have been lost during the construction of the dam to Llyn Clywedog. Contrasts with Snailbeach are also apparent through its management and presentation.

²⁸ <http://www.coflein.gov.uk> NPRN: 33989.



Fig. 10: Brytail Lead Mine in its setting

3.3. ASSESSMENT OF SIGNIFICANCE

3.3.1. Introduction

The following sections aim to use an understanding of the history and development of the Snailbeach site to inform and attribute significance values according to English Heritage's *Conservation Principles* (2008). These values are considered following an understanding of each element, using methods laid out in documents such as James Semple Kerr *The Conservation Plan* (1990) and Kate Clark *Informed Conservation* (2001). Significance is important to the assessment and justification of works to the historic environment, as laid out in *Planning Policy Statement 5: Planning for the Historic Environment* (PPS5) (2010).

Conservation involves managing change, not preventing it, and this should be informed by considering development proposals with an understanding of what matters and why. The statements of significance which follow can be seen as baseline information to provide evidence about the historic environment at Snailbeach in order to inform planning process decisions; signposts to further resources are given where appropriate. The four values as defined by *Conservation Principles* are:

- 1: *Evidential* – the potential of a place to yield evidence about past human activity.
- 2: *Historical* – the ways in which past people, events and aspects of life can be connected through a place to the present. It can be *illustrative* or *associative*.

- Illustrative – the perception of a place as a link between past and present peoples; it depends on visibility in a way that evidential value does not.
- Associative – association with a notable family, person, event or movement, and other aspects of cultural heritage such as literature and film.

3: *Aesthetic* – the ways in which people draw sensory and intellectual stimulation from a place. These values can be *fortuitous* or *designed*.

4: *Communal* – the meanings of a place for the people who relate to it. These can be *commemorative* or *symbolic*, and also spiritual.²⁹

Each value is then given a level – international, national, regional and local. Here, regional is regarded as meaning the West Midlands and local as Shropshire, although this can be further refined to the distinctive history and character of the Stiperstones area.

It should be recognised that the values attributed to the mining site and the levels of significance are as seen today, and are liable to change over time.

3.3.2. Character areas

For ease of use the site has been divided into nine ‘character areas’ (p.33), generally defined by process and historic development. These should not be taken to be definitive and significances will certainly cross boundaries. Features are numbered according to the system used in the 1990 LUAU survey. The purpose of this compartmentalisation is to describe in detail the significance of each area across a large site, including a summary of its history and development and brief descriptions of each asset – further archaeological analysis for each asset can be found in the 1990 LUAU survey and other research is referenced in the *Sources*.

3.3.3. Overview of significance

Evidential value

Evidential value derives from the site’s archaeological interest and the potential for it to yield evidence beyond that already investigated and revealed about past human activity at the mine. Snailbeach has national significance due to its evidential value, recognised through its designation as a scheduled monument. It is hidden remains, such as below White Tip and the dressing floor, which have particularly strong evidential value, although built structures such as the crusher house will also provide evidence of previous phases, perhaps as-yet disguised in later nineteenth-century rebuilding. The geology of the area also has evidential value, as it is for this reason that the mine was established in this location, and was the source of building materials for both industrial and residential structures. The use of the mine site in its current condition by wildlife also provides evidence for preferable conditions of, for example, calcareous-loving plants.

Historical value

The way in which past people and their lives are connected through a place to the present manifests itself at Snailbeach through the survival of visible historic remains, in both the

²⁹ English Heritage *Conservation Principles* (2008), paragraphs 35-60.

industrial and residential buildings and the infrastructure and earthworks created by the mining processes. Snailbeach has national significance due to its historical values related to its multifaceted mining history; this has been recognised in its designation as a scheduled monument. The area's social history also has regional and local significance, attributed mainly through its historic and communal values (see below).

The resulting visible layers of changing processes from the eighteenth century until the post-war years contribute towards understanding the historic development of lead mining nationally and the impact of the economy of lead on both industrial growth and social history. Although local people were generally employed in the Shropshire ore field, throughout the UK the almost definite promise of employment in mining (either in the metal industries or for other materials, such as slate quarrying) would have brought families to industrial areas, resulting in the need for schools, churches, shops and other social centres. This is seen on a small scale at Snailbeach, as the village retained a relatively small population and its vernacular heritage.

The purposes of different buildings illustrate how the mine was used, and as such links its past management to its present understanding. Many of the mine buildings are typical to sites such as this – a crusher house, winding engine house, etc. which would have been built to house engines of a standard size – but equally may be unique in materials and planning according to the mine's requirements and to cope with output. Examples of this are illustrated by the double-walled magazine and the Candlehouse. Such equipment and the provision of steam engines also place Snailbeach into the history of the Industrial Revolution. The use of local materials, namely mudstone, also creates distinctiveness, and the exposure of rock strata through blasting and the survival of the waste tips illustrate the events which shaped this place. The survival and conservation of above-ground remains are essential for public access and understanding of the mine's history. However, the underground shafts and remains which provide evidence of the mining process are only accessible to experienced cavers and as such, although they have value in themselves and are intrinsic to the mining process, cannot be understood as such by the general visitor (see Appendix 5).

Snailbeach also has associative historic value as source material for Mary Webb's 1917 novel, *Gone to Earth*. Webb renamed Lordshill as 'God's Little Mountain', and depicted a rural way of life which would have been familiar to many of the area's inhabitants at that time, especially to those living at Blakemoorgate and Blakemoorflat. References can be found in the novel to the Snailbeach area; these are quoted below in each character area as appropriate. In 1950 the eminent filmmakers Powell & Pressburger travelled to Shropshire to film *Gone to Earth* on location at the Stiperstones, using the Chapel Shaft area as the site of the village fete and home to the Rev. Edward Marston, a key character. Extras were cast from the Snailbeach residents and the mining site (then still partially in use) can be seen in the background of many scenes. The children's author Malcolm Saville also used the Stiperstones area as the setting for his 'Lone Pine' series, set in the post-war years. Mining remains feature in some of the books.

Historical values also have a strong relationship with social communal values (see below). Oral history and the survival of housing links to collective memory about ways of life, and enhances the social history of the place.

There is a significant amount of material surviving which helps understand the history and development of mining at Snailbeach, available in various archives across the county. This is summarised in *Sources* at the end of the document, but is not exhaustive. Primary material, such as records saved from the manager's office in 1965, will be particularly useful to investigations.

The setting and context of Snailbeach Lead Mine contribute to understanding past and present relationships of the mine to the surrounding landscape, both in a functional and aesthetic context. The wider setting of the mine within the Shropshire lead-mining area is important to this understanding, and illustrates the place which Snailbeach had as the most prosperous lead mining site in the county and, for a short time, in Britain.

Aesthetic value

Snailbeach Lead Mine does not have high aesthetic value, in the typical sense of the word, that is, concerned with beauty. Its aesthetic significance can therefore be classified as local, as buildings such as the pumping engine house are typical of the 'Cornish' design and the buildings are characterised as particular to the area through the use of local materials and vernacular styles. None of the buildings are consciously designed with artistic endeavour, and as such have no architectural pretensions. All is practical, although the attitudes of mine managers to achieve the best output and infrastructure, such as the location of the tramway, might arguably be attributed to design value. The way in which the mine evolved over time and responded to the development of industrial processes and technology also creates a layered character which adds to any aesthetic value. The abandonment of the mine attributes the area with fortuitous aesthetic value. The juxtaposition of structures to their setting, enhanced by natural topography and later vegetation contributes to this. The enhancement of the place through the passage of time (the 'patina of age') certainly applies to Snailbeach, as many of the buildings have a dramatic quality through their dereliction and the presentation of these ruins is an emotive connection to the past.

Communal value

The communal value of Snailbeach Lead Mine is particularly strong, and in some ways has national significance as social history particular to the place. In other ways it is local, as memories and understanding may not be thoroughly appreciated to those from outside the area. Five hundred men were employed at the mine in the 1850s, not all working underground. This had reduced to around thirty men a century later. Short life-spans and the dangerous conditions of the mine provide an exceptional emotive relationship between humanity and survival through mining, resulting in close-knit communities revolving around mining, farming and community life. The significance of the place creates an identity for those who are descended from the miners, and their collective memories are a good source of oral history which helps understand the mine, both in terms of its industrial processes and management, and of the social history related to working conditions and everyday lives of the miners.³⁰ Religion, and as such spiritual values, was dominant historically in mining communities, hence the title of a book of local memories, *Never on a Sunday*. Non-

³⁰ Some memories have been published in *Never on a Sunday* (2000).

conformism took hold as workers arrived from Cornwall and South Wales; chapels were built for Baptists in 1833 and Methodists in 1876, encouraged by mine managers such as Henry Dennis. Oral histories suggest that open-air services were held in the core area, the steps of the new engine house acting as the preaching box.³¹

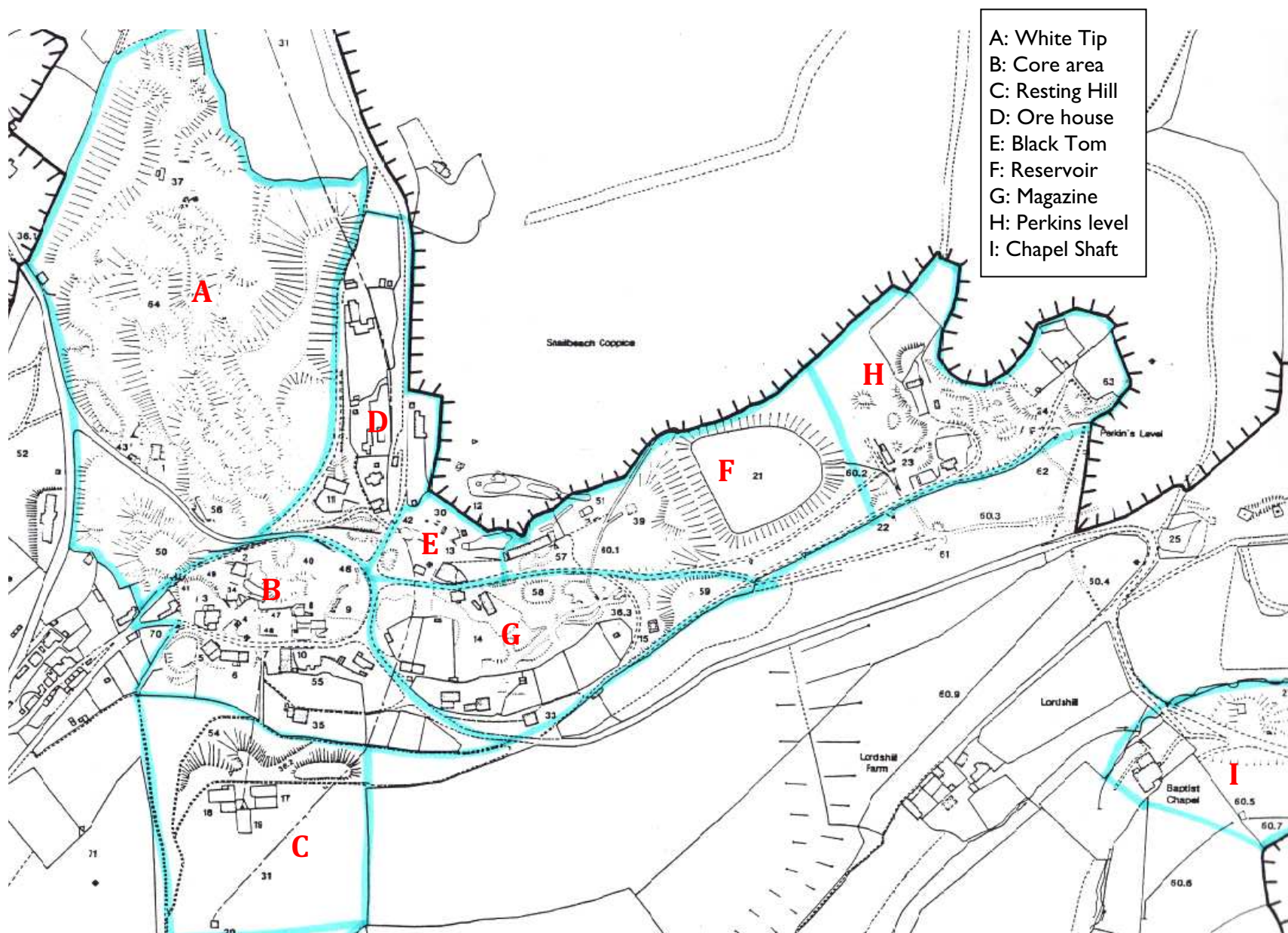
Whilst social values are less-dependant on the survival of historic fabric, they closely relate to the other identified values, enhancing the evidential and historic values displayed in visual remains through the telling of social anecdotes and stories. As such, much of the social value of the site may be intangible, being emotional and memory-based rather than expressed in the survival of built features. As such social values may be less clearly recognised by visitors, although interpretation may enhance this. A further example of working conditions and expressions of life at the mine are recorded in folk songs and stories - such as the legend of the 'knockers'; mythological leprechaun-like creatures whose name derives from the knocking sound created by creaking timbers and earth just before a cave in. To some the knockers were malevolent sprits causing the cave-in, and to others were well-meaning and warned of such accidents. Records of community groups, such as the Snailbeach Miners Benefit Society, also contribute to the social values of the mine and its people, especially in relation to death benefits. Many of the residents of Snailbeach and the surrounding areas were cast as extras in Powell & Pressburger's 1950 film of Mary Webb's book *Gone to Earth*. Filmed in the dying years of the mine's industrial history, this experience may still be seen by some as a way of being part of an exciting event and immortalising (or perhaps stereotyping) a local way of life.³² Identified social values could be said to shape community behaviour today, as it did historically. The social value of Snailbeach will be relevant outside of the immediate area, as many miners had to walk from surrounding villages such as Minsterley, and from the hill-top settlements at Blakemoorgate. These communal values can be attributed to the Snailbeach mining site as a whole, although some features and areas will identify more clearly with a specific group of people or event; these are identified in each character area as appropriate. Today's interest groups, Shropshire Caving and Mining Club and Shropshire Mines Trust Ltd for example, also have a close relationship with the mine, and the underground workings are of value to them.

Alongside these identified values as structured by English Heritage's Conservation Principles, there are further criteria, such as those used by Shropshire Council for assessing County Wildlife Sites, which will identify amenity, tourism and educational value. There is a strong relationship between heritage and amenity value, which can be developed to enhance the site's tourism offer. Value assessments such as this should be considered when considering conservation work or development to any part of the value-sensitive site.

³¹ *Never on a Sunday* (2000), p.33.

³² A list of the extras is available on the Powell & Pressburger fan website: <http://www.powell-pressburger.org/Trips/Shropshire/20020526/SSStar-20020509.html>

4. SIGNIFICANCE OF THE CHARACTER AREAS



A: White Tip

[Appendix I: Map 9a]

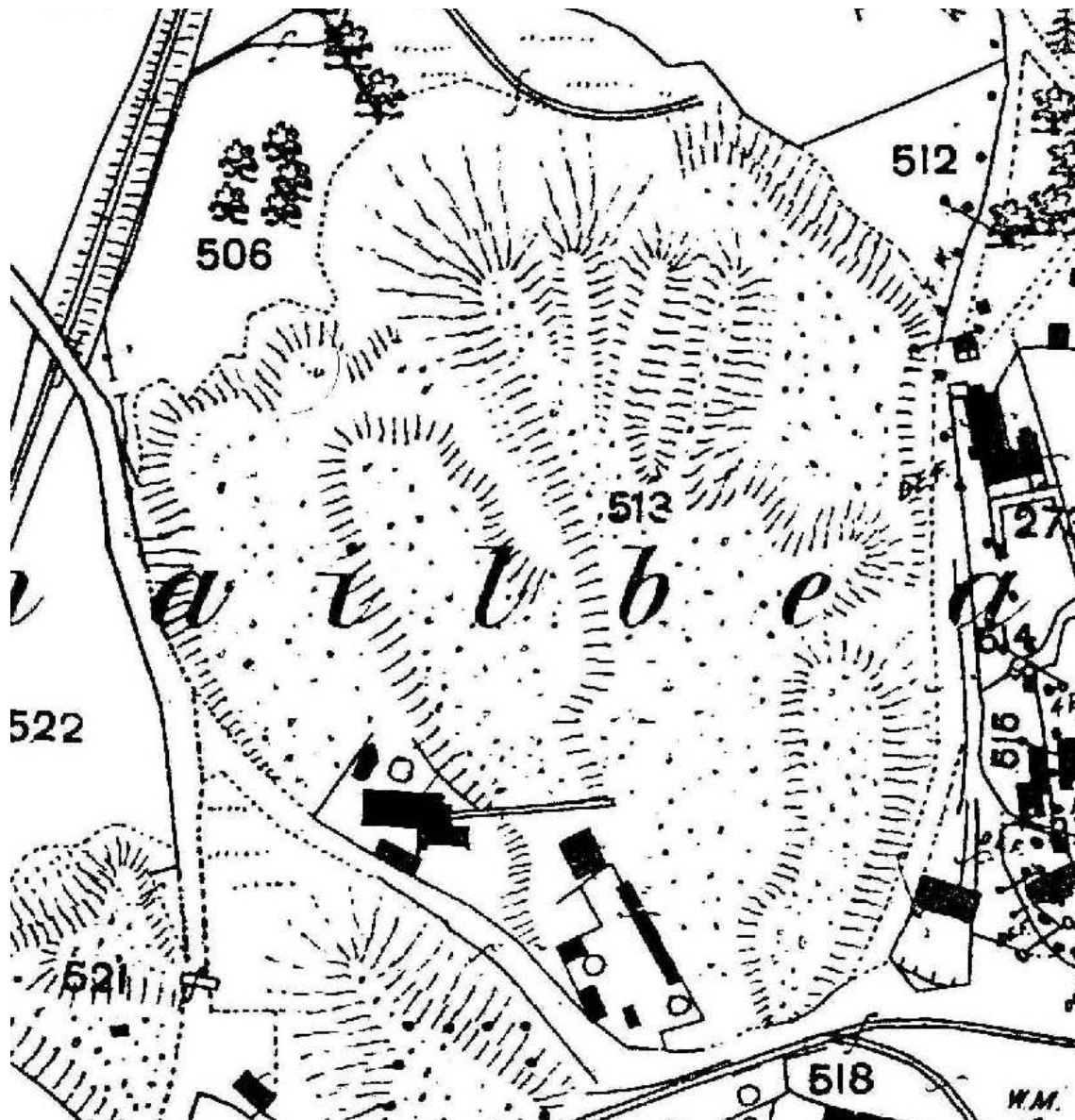


Fig. 12: Detail of 1882 OS map (1:2500), surveyed 1881

History and development

Until 1991 the White Tip was the mine's most prominent feature. It was first depicted on a map in 1864 by which time it had already covered about three quarters of its eventual area.³³ There was a dressing floor here from the early nineteenth century and shafts may have been located in this area before it became a tip. These features, as shown on a historic map, could be wells or on the line of a drainage adit.³⁴ The dressing floors were remodelled by James Eddy in 1872 and included several buildings, buddles and a branch of the Snailbeach District Railway (SDR) entering from the north, as shown on the 1882 OS map [Fig.12].

³³ LUAU, Vol.2, p.43 (map located at Longleat House).

³⁴ P. Sheldrake (pers. comm.)

The tip's 'whiteness' derived from calcite, a waste product from processing the ore, the plant for this itself gradually being covered by the waste. Historic aerial images show the extent of the tip and the impact it had on the landscape [Figs. 2 & 13], and became a local landmark. A 1945 Ministry of Town and Country Planning report described White Tip as 'a blot on the landscape'.³⁵ The 'black tips' to the south east of White Tip were extant from c.1850s, historically connected by a tramway to Day Level. The spoil was cut through for a bridge³⁶ for the SDR branch line in 1877 to allow the existing tramway to be retained.



Fig. 13: The White Tip in 1983 (Shropshire Archives)

At the north-east edge of the tip adjacent to the road and a SDR cutting are three buddles – a device used to separate lead ore from waste using flowing water. These were probably established in the 1860s to supplement further buddles in the core area but were gradually encroached upon by the tip. They were uncovered during a second phase of reclamation works in 1995.³⁷

The Halvans Company were processing the tips between 1900 and 1928, and on the south side of the tip an engine house housed a steam engine used to drive the tip reprocessing plant. Photographs show a two-storey structure with wooden lintels to openings and a square section stone chimney to the height of the building with brick above; the chimney was used for a fireplace on the first floor [Fig. 14]. The engine house was partially demolished by British Gypsum in the early 1980s, an action which spurred the

³⁵ Ministry of Town and Country Planning *The Problem of Snailbeach* (1945)

³⁶ LUAU reference 41.

³⁷ Hannaford, Hugh R. & Price, G. *A watching brief at Snailbeach Lead Mine*. SCCAS Rep. 58. (January 1995).

listing of the remaining historic buildings. In the final phases of work at White Tip a tractor and shovel and a fixed sorting screen were used; this is probably the primitive structure photographed in 1990 as shown in Fig. 15.³⁸



Fig. 14: Halvans engine house prior to its partial demolition and the landscaping of the White Tip (Shropshire Archives)



Fig. 15: Spar processing plant on White Tip, photographed in 1990 as part of the LUAU survey

Following their investigative work, LUAU stated that the White Tip is 'a very significant feature in the landscape and any change to its form will inevitably have a considerable impact in the integrity of the site'.³⁹ However, following many years of uncertainty about its safety and future, in the 1990s the mine was subject to major stabilisation work. In 1995, phase two of the scheme involved the regrading of waste and covering the White Tip with inert material and the installation of drains around the edges. The tip was landscaped, and covered in membrane and subsoil, and the primitive machinery [Fig.15] removed. A watching brief was carried out during the works and it was discovered that the waste was not dumped according to grade, as suggested by the 1838 Tithe map where the site is shown as plots.⁴⁰

³⁸ Shaw (2009), p.81.

³⁹ LUAU (1990), Vol.1, p.54.

⁴⁰ See: Hannaford, Hugh R. *Archaeological monitoring of land reclamation works at Snailbeach Lead Mine*. SCCAS Rep. 35. (August 1993).

Principal features (see Map 10a)

Halvans engine house (LUAU survey number 1)

c.1900. Square plan, stone and brick. Surviving features include foundations for the cylinder and a pit for the flywheel. Mostly demolished in the 1980s. Ruinous and unroofed. Scheduled.



White Tip (64)

Origins in early C19. Developed and grew until the mid C20. Reduced in size, consolidated and grassed over during a Land Reclamation scheme in the 1990s. Scheduled.



Buddles (64.1)

c.1860s. Three circular features of brick construction. Only exposed during the 1990s Reclamation Scheme, and therefore described by LUAU in 1989 as 'three ponds'. Scheduled.



White Tip spar processing area and mineral dressing floors (56)

Different phases; remodelled in 1872 by James Eddy. Some partially-buried structural remains survive.

Scheduled.



Spoil heaps (50)

c.1850s. Spoil and waste historically connected by a tramway to Day Level. The original road to Snailbeach ran under here, and part of the spoil was removed in 1877 to create a bridge for the SDR. Also known as the 'Black Tips'.

Scheduled.



SDR bridge (41)

1877. Stone-built abutments survive.

Scheduled.



Significance**Evidential**

- The White Tip area has high archaeological value which may conceal further evidence of mining activities. The LUAU report suggests that early, Roman or medieval, workings may survive beneath the tip. The tip's archaeological potential was highlighted by the finds discovered during the reclamation scheme.⁴¹

⁴¹ Hannaford, Hugh R. & Price, G. *A watching brief at Snailbeach Lead Mine*. SCCAS Rep. 58. (January 1995).

- The potential for further historic evidence coupled with that already exposed in the area potentially contributes to understanding industrial processes and the expansion and success of the mine.
- The land reclamation scheme has removed some evidence but this has not impacted on the ability for interpretation.

Historical

- Insight into the mine's working community and their activities through shared experience of the place is less evident in this area, as it is less clear how miners interacted with the tip due to the impact of the reclamation scheme.
- The development of the SDR illustrates the role of industrial transportation and Shropshire's minor railways.
- The physical remains also illustrate the historic development of the lead-mining industry and, more recently, the changing attitudes to mineral contaminants and health and safety.

Aesthetic

- The White Tip's aesthetic values are drawn from the fortuitous development of the place, and the growth of the tip relates directly to the success of the mine.
- The relationship of buildings to the White Tip is practical. The combination of built structures, such as the Halvans Engine House, and 'earthworks' enhance the landscape quality in this area.
- Arguably, the land reclamation scheme has either enhanced or reduced the aesthetics of the White Tip depending on how individuals respond aesthetically and intellectually to the landscape. On one hand it is no longer a 'blot on the landscape' as described in the post-war years and has been made safe and blends in with the rural surroundings; but conversely the aesthetic qualities of a scarred industrial landscape have been removed, placing the built industrial remains within a 'false' vegetated, rural setting.
- Both human and natural actions have helped enhance the aesthetic qualities of the White Tip area. Demolition and reclamation for safety reasons have, arguably, provided a more accessible and evocative experience.

Communal

- The communal value of the area is tied up in the significance of the site as a whole (see *Overview of significance*). Specific memories of children playing and sliding on White Tip are retold in *Never on a Sunday*.⁴²

⁴² *Never on a Sunday* (2000), p.14.

B: Core area

[Appendix I: Map 9b]

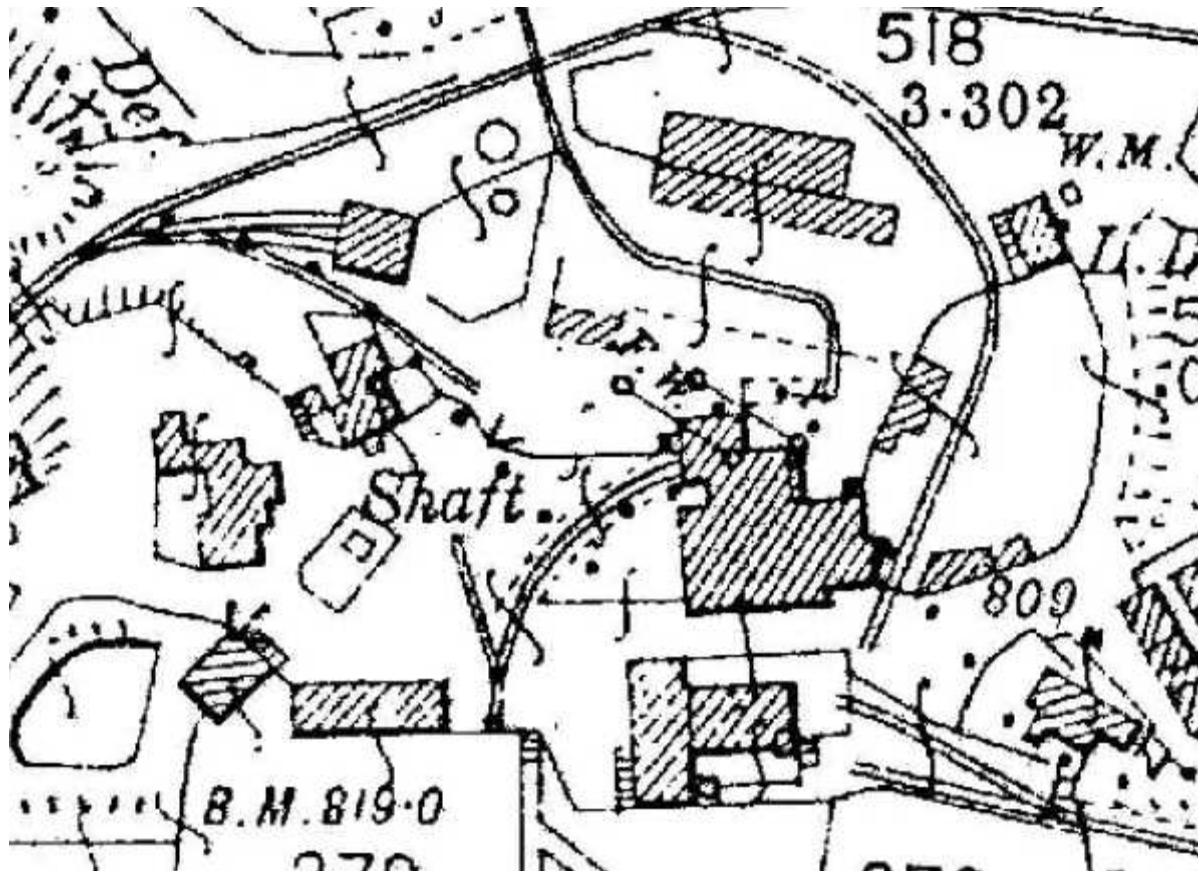


Fig.16: Detail of 1901 OS map (1:2500), surveyed 1881, revised 1901

History and development

The focus of daily mining activity was concentrated in this area, which contains the highest density of standing and buried remains. The development of the core area is best seen through map regression, and its history is defined in detail elsewhere.⁴³ The history and development of each principal feature is defined below, and historic links between these made where appropriate to augment their significance.

The narrow gauge tramway (not to be confused with the railway, the Snailbeach District Railway - SDR) was an important and integral part of the Snailbeach mine. Powered by horses it transported raw materials around the site and out to the New Smeltnill, and dictated the location of later buildings. The SDR opened in 1877 linking to the Great Western Railway main line which had been extended to Minsterley in 1861.⁴⁴ The 2ft 4in gauge railway never carried passengers, instead transporting imported coal (the Pontesford coal field was not used after 1862) and lead ore to and from Pontesbury Sidings and the New Smeltnill, with a reverse line being constructed into Snailbeach, terminating at the Locomotive Shed. Built on the site of a former dressing floor (shown on a 1766 estate

⁴³ *Snailbeach Lead Mine, Shropshire* (2008) provides a good starting point for the mine's history. A list of identified maps is included in *Sources*.

⁴⁴ It has been suggested that the horse tramway was disused following the SDR's opening (Cuckson, in NG&IRM Review, p.231).

map⁴⁵) the shed accommodated two engines, with a timber canopy added between 1900 and 1925 to house two further locos, and smoke cowls added in the mid-twentieth century. The SDR operated under various ownerships until 1947 when it was leased to Shropshire County Council and was abandoned in 1959.⁴⁶

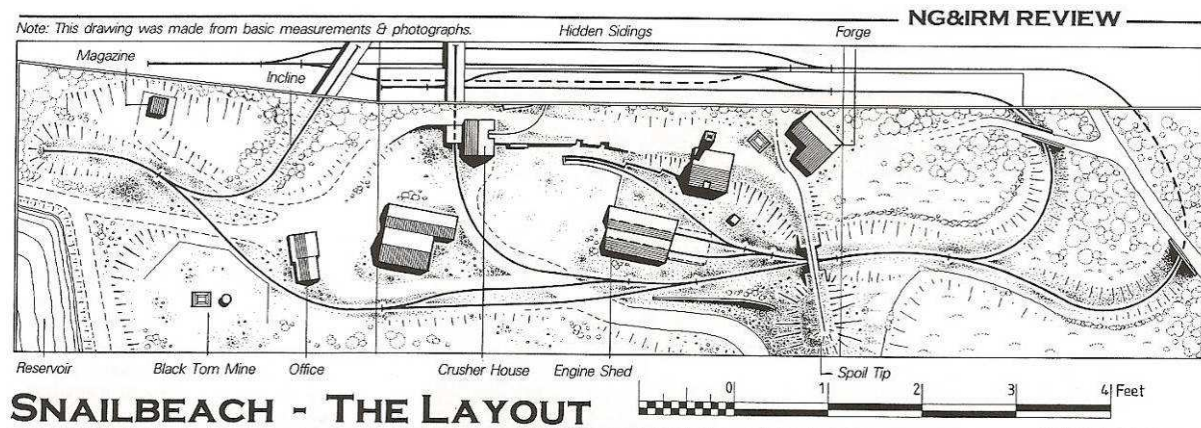


Fig. 17: Plan of tramway layout in core area. North is at the bottom of the image. The SDR crosses a bridge above the spoil tip (Brewer, p.223).

The Blacksmith's Shop complex contains some of the earliest substantial building remains within the site. The engine house to the south of the Blacksmiths' Shop is thought to date from 1797 and the shop itself from c.1864. Associated with various demolished buildings and a yard to the east, the complex has a complicated phasing. The Blacksmiths' Shop was essential to the mine, making metal parts for machinery and providing facilities for sharpening drills used underground and other tools [Fig.18]. The Old Engine House, probably dating to the eighteenth century, supplied power to the adjacent shaft, at times called Ladder Shaft, Old Shaft and George's Shaft. The engine house has lost a third storey and chimney, the latter shown in historic photographs. Historic Ordnance Survey maps show a reservoir to the south-west of the area - possibly excavated in the late eighteenth or early nineteenth century and extant well into the nineteenth century - which may have supplied water to a steam engine and for the dressing floors; the engine may have been that supplied by Boulton & Watt by 1797.⁴⁷ The reservoir partially survives with flagstone walling on its north and west sides. The Old Engine House was superseded by the New Winding Engine House in 1872, located directly adjacent to this reservoir.

⁴⁵ LUAU, Vol.2, p.2 (this map was not located during the recent research).

⁴⁶ More information on the SDR can be found in various sources, including: the LUAU report (1990), pp.29-30; Eric S. Tonks *The Snailbeach district railways* (1950/2007); and D. Brewer 'Snailbeach-modelled in 4mm scale' and A. Cuckson 'Snailbeach-the railways and mines' in *Narrow Gauge and Industrial Railway Modelling* Issue 15.

⁴⁷ LUAU, Vol.2, p.7.



Fig. 18: Smiths outside the Blacksmiths' Shop in the core area
www.shropshiremines.org.uk

There may have been a shaft in the vicinity of George's Shaft since 1766 although there is no definitive evidence for this, but the use of a Boulton & Watt engine at the mine in 1797 suggests the presence of a shaft here; 'Old Shaft' is recorded in 1863 and 'Ladder Shaft' in 1864. The shaft was deepened in 1870 and the early horse gin used for winding was superseded by the erection of the New Winding Engine House in 1872. This housed a double-drum horizontal steam winder, replaced by a single drum engine in c.1911 but scrapped in 1927. Cages were introduced around this time to lower miners into the shaft using a pulley system, driven by the 1872 engine house. On 6 March 1895 the shaft was the site of the 'George's Shaft disaster' when seven miners died when the steel winding rope to the cages broke.⁴⁸

The Miners' Dry buildings, one single storey and one double height, were constructed between 1872 and 1875, replacing a 70ft-long building in the same location from the 1850s [Fig.19]. The LUAU report suggests that the single storey building was a store, but the buildings are so-called as the miners would dry themselves and their clothes in the building after their shift. They may have even slept here. The double-height building was converted into a visitors' centre in 2000, with funding from the HLF, and the single-storey building was reinstated and opened in May 2011 for use as a changing area for underground tours. The latter was partially funded through the HLF, as part of a larger interpretation project undertaken by Shropshire Council and Shropshire Mines Trust Ltd.

⁴⁸ An account of the disaster by the Inspector of Mines is reproduced in *Snailbeach Lead Mine, Shropshire* (2005), pp.66-73.



Fig. 21: Lantern slide showing the core area, probably in the late 1950s. The building on the left is the Mine Manager's Office, with a corner of the Blacksmiths' Shop to the right and George's Shaft and the Compressor Engine House in the background, overshadowed by Resting Hill (www.darwincountry.org)



Fig. 22: The Crusher House in 1950; it has since been substantially demolished (Shropshire Archives)

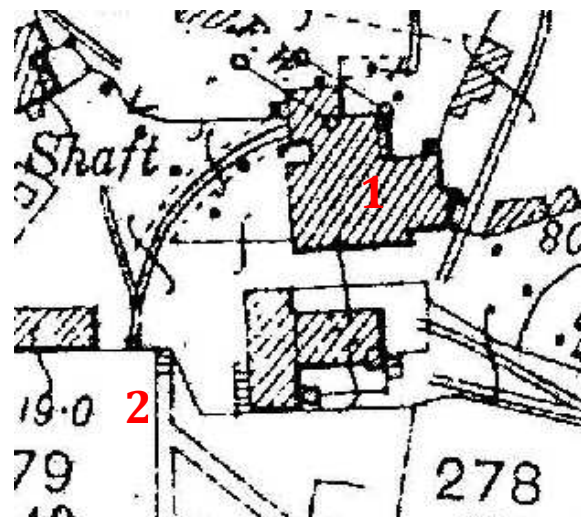


Fig. 23: Detail of the Crusher House complex (1) and the connecting tramway to Day Level (2), from the 1901 OS map (1:2500)

Once the ore was brought up the shaft and had been crushed it was taken to the dressing floors. The floors surviving today date from after 1864, as before this date map evidence suggests that the area was covered by a spoil heap; the floors may have been a product of the mine's remodelling under James Eddy between 1862 and 1869. The 1882 OS map and a larger detailed map from c.1875⁵¹ show a series of long buildings on the site, also identifiable on historic photographs as possibly those built in 1872 to house four buddles and eight jiggers [Fig.16].⁵²

The LUAU report divides the dressing floor area into two, east and west, and at that time (1989) the remains of a complex of timber sheds and a sunken area were the only features identified. Once the ore was processed it was tipped into a hopper-like construction in the centre of the dressing floor and taken by underground tramway to the Ore House, to the north (*Character Area D*). To the south of the dressing floors is an area defined by a retaining wall. The LUAU report highlights the complexity of this wall feature, which stretches from the Locomotive Shed to the Crusher House complex, part of which it incorporates. The report suggests that from a 1766 estate map this was the edge of the core processing area, and the retaining wall was in place by 1838. Later changes including the phased building and reconstruction of the Crusher House complex are documented. Of further interest is a large iron grille leaning against the retaining wall and described by LUAU as a walkway; this has since been identified as a grizzly, a sieve-like machine to separate different sized ore.

The Manager's Office complex comprises a series of ruinous structures, most notably the main block to the south of the Locomotive Shed. This contained an assay office, either within the building or – as suggested in the LUAU report – to the north of the steps to the south-west. The upper storey was an administrative office. A watching brief and survey was carried out in 1995 during repairs to the complex.⁵³

⁵¹ 4748/48 (Dennis collection): Snailbeach railway plan on main line and branches, 40ft to the inch, c.1875. Inscription on reverse 'R. Wilson'.

⁵² Shaw (2009), p.78.

⁵³ Hannaford, Hugh R. & Price, G. *Building recording and archaeological monitoring of consolidation works at Snailbeach Lead Mine*. SCCAS Rep. 80. (1995).

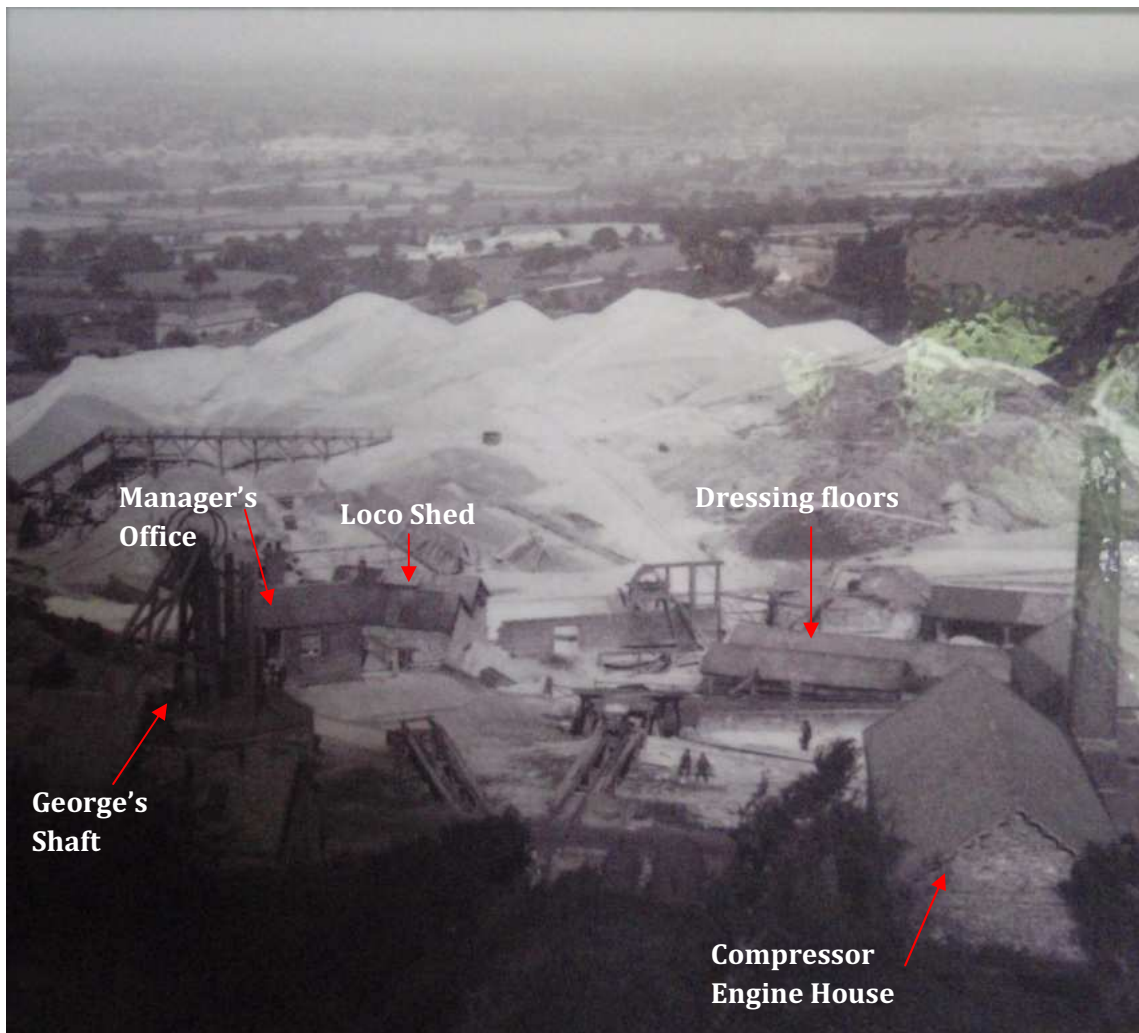


Fig. 24: Photograph of the core area from the south, probably dating to the early twentieth century (Natural England interpretation board at Blakemoorgate)

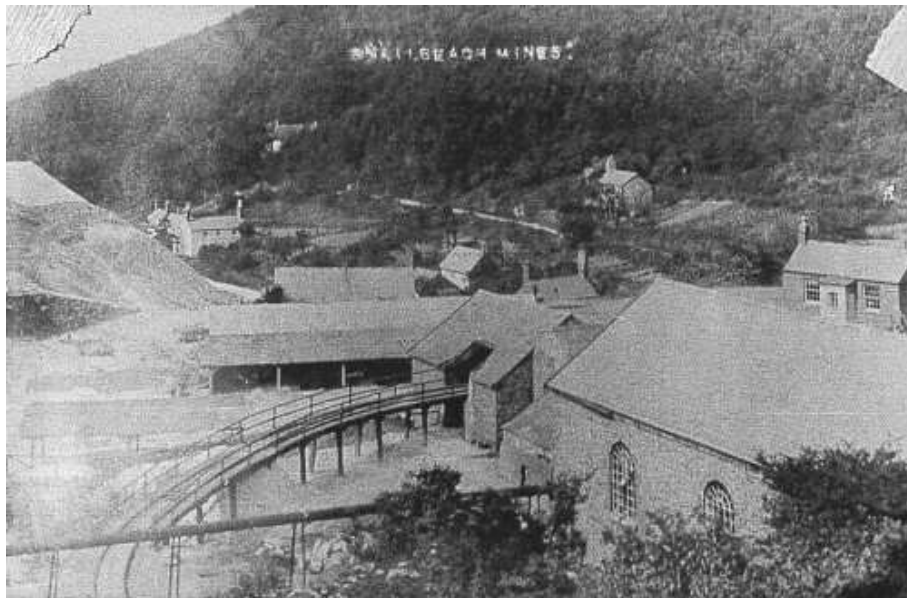


Fig.25: Photograph of the Compressor Engine House and Crusher House with overhead tramway, probably dated to the 1880s

Principal features (see Map 10a)

Locomotive Shed and platform (2)

1877 and later. Irregular rectangular plan, double gable roof, built of uncoursed stone originally with a slate roof, replaced with timber and corrugated iron sheeting. Windows have timber lintels and brick reveals. Two inspection pits and some internal features including a smith's furnace survive internally. The platform stretches from the south-east corner of the shed towards a retaining wall, with in situ tramway lines on the southern edge of the platform.

Scheduled. Grade II listed LEN: 1055011.



Old Engine House (3.1)

c.1797. Square in plan, two storeys of uncoursed flagstone with handmade brick quoins and dressings (further analysis in LUAU report, pp.3-4). The building is roofless. Scheduled. Grade II listed LEN: 1176609.

Blacksmiths' Shop (3.2)

c.1864. Hand-made brick walls with a central brick chimney and corrugated iron roof. Internal surviving features include a forge and bellows, and a large quantity of equipment. Scheduled. Grade II listed LEN: 1176609.



George's Shaft(4)

Also known as Ladder or Old Shaft. For an analysis and description see LUAU report (1990), p.5. Headgear re-erected with HLF grant in 1999.

The ground below is scheduled.



Miners' Dry (6)

Constructed between 1872-5. Changing house or barracks, now visitor centre. Two contemporary ranges, dark coursed flagstone with brick quoins. The larger building has two entrances to the north, with an opening in the east wall probably connecting to a boiler. Internally there is evidence of a first floor, and evidence of two staircases was revealed during refurbishment in 2000. It is now in use as a visitor centre.

The single storey building was restored in 2010 aided through a HLF grant. The LUAU report suggests that no windows were visible in the standing walls at the time of survey, and none are identifiable on a photograph from 1900; a window was added on the N elevation during the restoration works.

Scheduled.



Before completion of single-storey building (May 2010)



Following completion (May 2011)

Crusher House complex (8)

Buildings in this location marked on maps from 1864, with the Crusher House itself (8.2) built c.1881. The Crusher House complex is generally in ruinous condition, with the engine house and chimney the only readable survivors. The engine house is stone built with brick linings to doors and windows, and incorporates a circular hole for the drive to the engine house and a circular recess for the raff. The chimney has a stone base and brick upper. There are various stone structures in the vicinity of the chimney and engine house which are analysed in the LUAU report (p.11). Repairs to the complex were carried out in 1995.

Scheduled. Grade II listed LEN: 1176636.



Compare with Fig.22.

New Winding Engine House (5.1)

1872. Also known as George's Shaft engine house. Two storeys, rectangular in plan built of grey flagstone with sandstone dressings. Steps with some surviving wrought-iron work lead to a doorway at first floor level. Datestone in centre of N gable '1872'. Additions to the E are the sole survivors of a boiler 'house' built in c.1900. Steel shoring was added in c.2000 and removed in September 2011. Whilst the walls substantially remain, both buildings are roofless. Scheduled. Grade II listed LENO: 1367007.



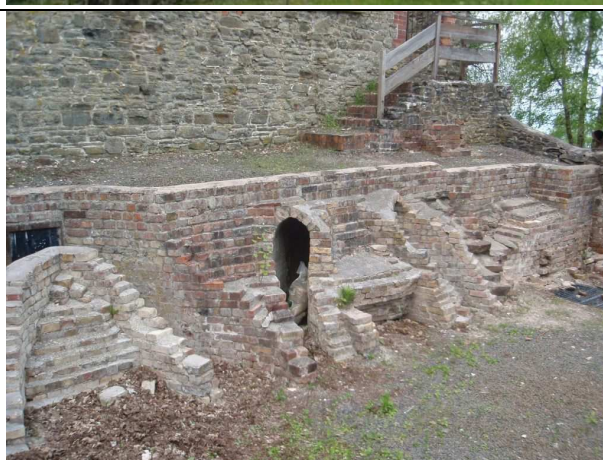
Compressor Engine House (10.1)

1881 (datestone, and date on chimney). Two storeys, rectangular in plan with a gabled, king-post roof. Constructed of dark grey flagstone with brick dressings to round-arched windows on the upper level. The chimney (10.3) has a stone base and brick upper. Whilst the walls substantially remain, the building is roofless. Scheduled. Grade II listed LENO: 1055012.



Compressor Boiler House

1881. Scant remains of a yard and flues for the Compressor Engine House. The flues are of brick construction and the yard is surrounded by a brick wall. To the south are a series of coal bunkers. Scheduled.



Coal bunkers (55)

Adjacent to the compressor house. Low walls, mentioned by Brown (1988, 25). LUAU report presumes they were related to the construction of the SDR, and coal trucks probably accessed the area from a higher level to the south. Scheduled.



Day Level (7)

Level driven 1848 to intersect engine shaft on Resting Hill. The adit portal has been repaired although the timber lintel is original. The tramway connected the level with various parts of the site, notably the crusher house, and rails are visible on the ground.

Also referenced as 16 (adit D).

Scheduled.



Carpenters' Yard (9)

Labelled on 1872 map.⁵⁴ A partial structure near the crusher house may be the remains of the carpenters' shop (SMT trail, 2011), but the rectangular saw pit (LUAU ref.9.1) is the only visible surviving feature of the yard.

Scheduled.



⁵⁴ LUAU, Vol.2, p.11 (map located at Longleat House).

Manager's Office complex (34)

Mid 19th century. A mix of stone and brick construction with slate hanging to west elevation. Two storeys with internal evidence of a fireplace. The building is roofless. Scheduled.



Mineral dressing floors (40)

Large undulating and rough area, probably dating to the mid 1860s. There are no standing structures on the dressing floor, but it is intrinsically connected to the various industrial processes. The entrance to the ore tunnel is located at approximately NGR SJ3746302198. Scheduled.



Retaining wall (47)

Stone retaining wall approx. 12ft high, retaining higher level area to north of Manager's Office and stretching east to the Crusher House. In various states of decay. Metal and timber grizzly propped against wall near loco platform. Scheduled.



Mine Count House (35)

Pre 1847. Administrative counting house, probably where the miners received wages. Appears on 1847 Tithe map as 'Upper Slang'. Now a domestic dwelling. Not scheduled, unlisted. Within Snailbeach Conservation Area.



Significance**Evidential**

- Further investigations of underground remains described in documentary evidence have the potential to provide more evidence of human activity, and therefore enhance understanding of historic ore processing, mining technology and the evolution of the mine.
- Advancements in industrial processes resulted in the demolition or adaptation of structures, and there is the potential for archaeological evidence of this (such as earlier phases of the Crusher House and Miners' Dry) to enhance our understanding of the past.
- In areas such as the dressing floors where transient buildings have been removed there is the potential to further understand the morphology of the core area and the relationship of buildings to the tramway.

Historical

- This is similar to how the site is given evidential value but through the visible survival of remains: the character and historic use of the mine buildings are similar to those in other lead mining areas, but are also individual to Snailbeach. The use of local materials and the positioning of buildings to achieve their best use are unique to the site and illustrate the intentions of the mine manager; to get the highest yield and provide the mine with all the necessary facilities - a Blacksmiths' Shop, Miners' Dry and offices.
- The survival of buildings in the core area, such as the Compressor Engine House, also illustrates the technology available at the time, providing evidence to understand the attitudes and relationship of people, both miners and managers, to the mine. Such equipment and the provision of steam engines also place Snailbeach in the history of the Industrial Revolution.
- Historically, changing circumstances subconsciously affected any values the mine had before its closure, and its closure, neglect and dilapidation (also due to a change in circumstance) have resulted in the erosion of these values. However this process is illustrative of the changing factors which affected industry and are seen as values today.

Aesthetic

- None of the buildings at Snailbeach could be said to have high architectural value in terms of their historic design. Some effort at architectural embellishment was attempted by using different coloured bricks [Fig. 26] and placing bricks on the diagonal to create decorative eaves cornices. The interior of the Manager's Office may have had some decoration, but this has been lost.
- The buildings were designed to be practical and evolved alongside technological and industrial processes, and as such any aesthetic quality is fortuitous, enhanced today by the mine's setting. Arguably this also reduces the 'true' aesthetic quality of the mine, placing it in a vegetated setting contrary to its original industrial surroundings.

Communal

- The communal value of the area is tied up in the significance of the site as a whole, but could be seen as at its strongest here (see *Overview of significance*).
- Surviving generations of those killed in the George's Shaft disaster may associate commemorative value with that part of the site.



Fig. 26: Different colour bricks and materials on the compressor house chimney

C: Resting Hill

[Appendix I: Map 9c]

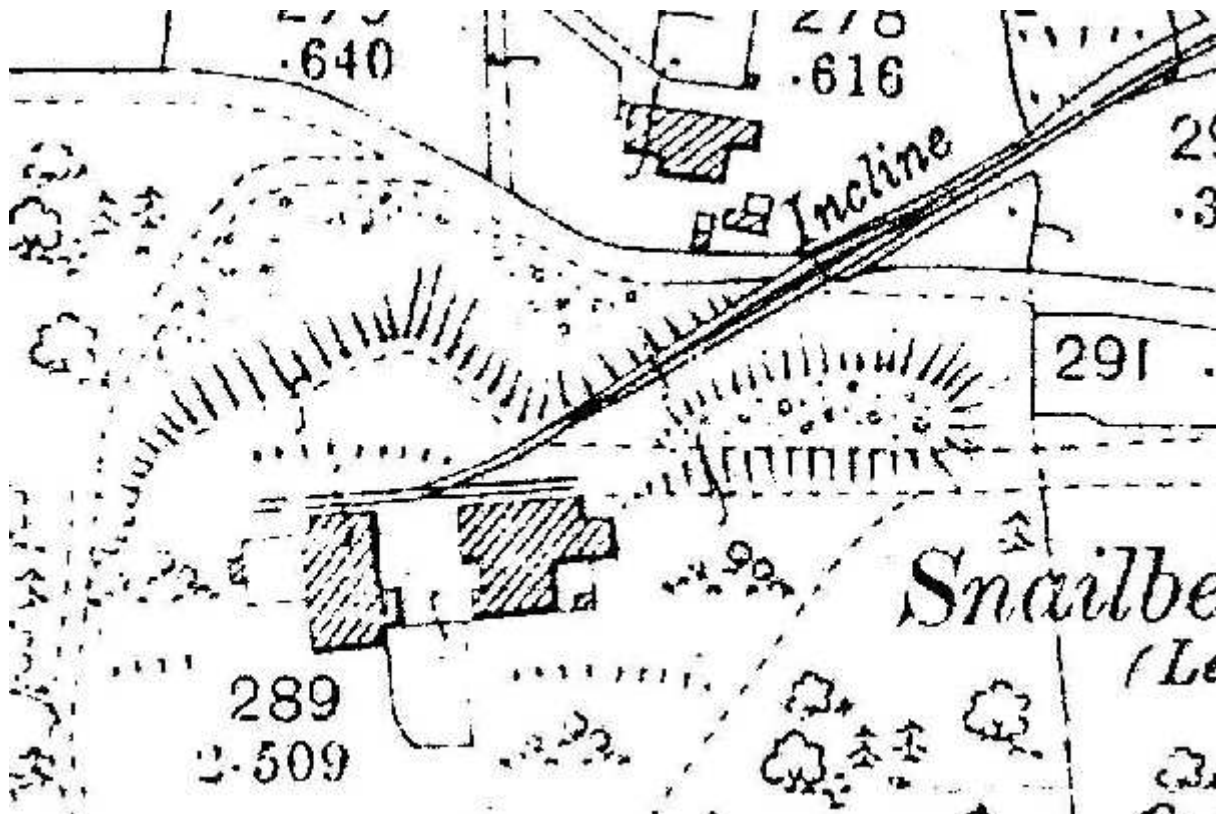


Fig.27: Detail of 1901 OS map (1:2500) showing the Pumping and Winding Engine Houses and the incline railway. Engine Shaft itself is not shown.

History and development

Located 120m south of George's Shaft, the Engine Shaft area on Resting Hill was first established in the 1840s. Archaeological survey and analysis of the area was carried out in 1997 to establish the phasing and role of the buildings within the wider site.⁵⁵

Engine Shaft was used for winding and pumping and runs vertical to the 342 yard level, inclined to the 462 yard level in 1862. The shaft may have first been sunk in the 1790s when it was linked to the Wagbeach drainage adit when flat rods were used for pumping water out of the mine.⁵⁶ Engine shaft connects to Day Level, and so was certainly in use by 1847 in connection with the Winding Engine House. The shaft was probably deepened in 1856 under Stephen Eddy. In the early history of the mine adits were driven from low points in the valley to meet the veins in the hills, using horse-powered gins to raise water to the surface, dispensing of expensive machinery until they became very deep. Brook & Allbutt suggest that underground water was not a serious problem at Snailbeach due to the hardness of the underlying stone. However, due to its location water shortages at Snailbeach were an issue; Brook & Allbutt also suggest that when waste water occurred it was allowed to run back into the mine shaft and pumped out when later required for

⁵⁵ Morriss, Richard K. *Snailbeach Lead Mine, Shropshire: an archaeological analysis & survey of the new engine shaft area*. Mercian Heritage Series, 33 (February 1997).

⁵⁶ Separately scheduled, LEN ref: 31761.

washing and processing.⁵⁷ The Resting Hill Pumping Engine House was built in 1856, and a 60" Cornish engine was installed in 1858, replacing the flat-rod system. The balance bob housing for the engine house is located to the south of the shaft opening, and was constructed in 1858. The whole complex was in place and functioning in 1864.⁵⁸ The engine stopped pumping in 1911 and was sold in 1913.

An inclined railway was constructed following the establishment of the SDR in 1877, linking Resting Hill Engine Shaft and the tramway system on the valley floor. Coal was bought in on the SDR from Pontesbury, transferred to trucks on the smaller tramway, and hauled up the inclined plane to the engine houses on Resting Hill. Nothing was transported on the trucks' return journey. Prior to (and possibly after) its construction the surviving track between the Candlehouse and Engine Shaft was used.

Resting Hill chimney (often erroneously referred to as Lordshill chimney) was constructed in 1885 following the collapse of an earlier chimney built in 1862 contemporary to the New Smeltnill, its purpose being to draw the smelters by connection with an extensive flue, sections of which can still be traced. Following the closure of the New Smeltnill in 1895 the 1885 chimney remained in use by the Pumping and Winding Engine Houses.

Once the buildings were abandoned, their roofing materials were removed or robbed and the structures left exposed. Their condition worsened until in c.1994 the Pumping Engine House roof timbers collapsed damaging part of the gable wall. The Winding and Pumping Engine Houses were repaired in 1997, when the Pumping Engine House west gable was formed into a twin apex and a barrier inserted internally to create a viewing platform.

Principal features (see Map 10a)

Winding Engine House complex (17)

Horizontal winding engine complex comprising an engine house and a boiler house. Possibly dates from 1848, the same date as the Day Level, with which the engine house is connected.

At the time of the LUAU survey in 1990 the building was in a ruinous condition, but has now been cleared and consolidated. Resources for further information and surveys of the complex (1997) can be found in the *Sources*. Scheduled. Grade II listed LENO: 1176648.



⁵⁷ Brook & Allbutt (1973), pp.13 and 73. Further information on the mine's water supply is included under *Character Area G*.

⁵⁸ LUAU, Vol.2, p.18 (1864 plan of Snailbeach Lead Mines, located at Longleat House and not viewed for this analysis).

Pumping Engine House complex (18)

1856. Stone built 'Cornish' engine house with dressed quoins, square in plan, approximately 3 storeys, with timber lintels to openings. At the time of the LUAU survey in 1990 the building was roofed; it has been consolidated and is now unroofed. Internally there is a platform with a concrete pad, presumably for machinery, and a modern timber railing. Modern timber steps are provided for access on the west side. The building is roofless. A building adjacent to the north elevation, now ruinous, housed an engine for the SDR inclined railway. Resources for further information and surveys of the complex (1997) can be found in the *Sources*.

Scheduled. Grade II listed LEN: 1366969.



Engine Shaft (19)

Located to the east of the Pumping Engine House, used for winding and pumping. The shaft head has been reconstructed.

To the south of the shaft opening is an enclosed area which historically housed the balance bob for the Cornish engine.

Scheduled.



SDR inclined railway (36.2)

c.1877. Much overgrown sloping area, surviving as a sunken linear earthwork, but cut away in the lower section for house platforms. Scheduled.



Resting Hill chimney (20)

1885. Connected by an extensive flue to the New Smeltnill to the north of the Snailbeach mining site. Stone built square base with octagonal red brick stack in English Bond. Two openings in the base, one in the north face for the flue and one in the south face, formed by brick arches with a double row of headers. Scheduled. Grade II listed LEN: 1055013.



From the miners' path to Blakemoorgate

Significance*Evidential*

- As with the other areas of the Snailbeach mine site, Resting Hill has the potential to contain a large amount of archaeological remains related to industrial processes which provide evidence to further understand the mining site.
- The removal of parts of the inclined railway for housing may have reduced the understanding of its workings.
- A track adjacent to the inclined railway was used to transport coal to the engine houses before the plane's construction; this potentially provides evidence of the access routes made across the mine site and may enhance the interpretation of this.

Historical

- The character and historic use of the mine buildings are similar to those in other lead mining areas and particularly in Cornwall, but are also individual to Snailbeach. The positioning of these buildings at Resting Hill is unique to the site and illustrates how the best use was made of land in order to gain the highest productivity.
- The survival of a footpath to the west of the structures leading to Blakemoorgate also illustrates the connection of the mining site with the miners' houses, and is important in our understanding of the social history of the area. The identification of historic man-made markers along the way would enhance its value.

Aesthetic

- The aesthetic qualities of the Resting Hill area are fortuitous, formed by deterioration, 'the patina of time', and vegetation. The emergence of the structures through managed tree cover gives a pleasing display but could also be construed as 'false' surrounding.
- Resting Hill chimney was located to disperse fumes from the smelting process away from the residential areas lower down the valley. As such its location is practical, and the landmark value it has could be said to be fortuitous rather than conscious, but it may also have been placed at the highest point on the mine site to signal its location.

Communal

- The communal value of the area is tied up in the significance of the site as a whole (see *Overview of significance*).
 - The historical value of the miners' path will also have social value, relating to a sense of identity for those descended from the Snailbeach miners who lived at Blakemoorgate. It is likely that this path has been remade, but this social value is less-dependant on the survival of the complete original route.
-

D: Ore House

[Appendix I: Map 9d]



Fig.28: Detail of redrawn and annotated 1882 OS map (surveyed 1881)
(Shropshire Archives 4773/25)

History and development

The Ore House was built to store crushed lead ore before it was transported by tramway to the New Smeltnill, built in 1862. Prior to this ore was taken by road to the Pontesford smelter, and this transportation method may have continued in the first years of the New Smeltnill. The Ore House and tramway connection is shown on the 1882 OS map [Fig.28] and may have been built at the same time as a remodelling of the dressing floors under James Eddy in the 1860s.⁵⁹

Ore would be transported on small trucks from the dressing floor via an underground ore tunnel into a yard and loaded into the Ore House. Large openings in the south elevation facilitated this. It is possible that the tramway ran straight through the building as this would have allowed for easier unloading and loading. The horse-drawn tramway running north to the New Smeltnill is shown on an 1875 map and an annotated version of the 1882 OS map [Fig.28], but does not appear on any later mapping. The New Smeltnill closed in 1895. A series of earthworks survive in Snailbeach Coppice to the east, which may relate to the tramway.

The cottage at No.4 Snailbeach was probably constructed in the mid-nineteenth century and is similar in size and construction to cottages built at Blakemoorgate, where a greater concentration of miners lived. These cottages are often described as 'squatters' cottages under the tradition of having smoke coming out of the chimney before sunrise providing the owners with rights to live there. There is no conclusive evidence of this, and the cottages are generally more substantial than cottages such as 'tai-un-nos' - one night cottages - built in other industrial areas, such as North Wales. At Snailbeach the cottages were owned by the Marquess of Bath who profited from a small rent payment. A parliamentary enquiry in

⁵⁹ 4773/25 (Dennis collection): Snailbeach surface map, on a tracing of 1882 1:2500 OS map. Stamped 'Henry Dennis Ruabon 17 March 1882'. North is on the right hand side of the plan.

1863 described the workers' housing as 'mostly mud huts that [were] anything but healthy'.⁶⁰

Principal features (see Map 10a)

Ore House (11)

Built between 1864 and 1869. Rectangular single-storey building of coursed stone with brick dressings. Large windows to west and north and double-doors to south. Now in use as a Baptist chapel.

Grade II listed LEN: 1307830. The building is not scheduled, although the ground beneath is.



Entrance to ore tunnel (38)

Built between 1864 and 1869. This opening is the only visual evidence of an underground tramway tunnel which ran from the dressing floors.

Scheduled.



No.4 Snailbeach

Single pile, stone built miners' cottage probably built before 1847 (depicted on Tithe map). Slate roof and brick stack to south. Described as a 'squatters' cottage and shown before recent alterations in *Snailbeach Lead Mine, Shropshire* (2008), p.78.

Unlisted and outside of the scheduled area. Within the Snailbeach Conservation Area.



⁶⁰ Recounted in *Snailbeach Lead Mine, Shropshire* (2008), pp.35-7.

Significance

Evidential

- The Ore House area is intrinsic to understanding the processes involved in the processing of lead at Snailbeach. The entrance to the ore tunnel on the dressing floor was revealed in July 2011, and there is the potential for this to provide further evidence of these processes.
- The historic construction of No.4 Snailbeach has the potential to provide evidence for the miners' way of life and may enhance the evidential values of the miners' cottages at Blakemoorgate; however, recent alterations may have removed evidence.
- There is also the potential for evidence of the tramway to the east of the ore house running north to the Smeltnill, but this is on private land and was not inspected.
- There is the potential for further investigation into the relationships between the core area and the New Smeltnill, especially the treatment of ore before and after the Smeltnill's construction and closure.

Historical

- The site's historical values are expressed through the survival of remains, and the locations of these features in particular are specific to the positioning of mining processes and the relationship of the main site to the Smeltnill.
- No.4 Snailbeach contributes to the understanding of the area's social history, although recent alterations may have begun to erode this. Changes in ownership also illustrate the impact of the mine's closure on the workers.

Aesthetic

- There is less deterioration in this area, the Ore House being used as a church, the cottage inhabited, and the tunnel opening well-managed. Neither the Ore House nor cottage have architectural pretensions and were built out of necessity and practicality.

Communal

- The communal value of the area is tied up in the significance of the site as a whole (see *Overview of significance*).
 - The historical value of the miners' cottage may also have social value, relating to a sense of identity for those descended from the Snailbeach miners.
-

E: Black Tom

[Appendix I: Map 9e]



Fig.29: Detail of 1901 (1:2500) OS map showing the Black Tom area. None of the structures extant today are depicted.

History and development

Located away from the core area, and distinguished on early maps as being outside of the main mine area, Black Tom was a distinct shaft with its own winding and pumping engine house and head gear.⁶¹ The LUAU report states that ‘documentary evidence indicates that a ‘Black Tom’ shaft had been sunk to 40 yards by the 1820s’ with an additional shaft sunk 80 feet to the east by 1864. The latter became the shaft that is visible today; it was 120 feet deep to the 40 yard level. A horse gin was used at Black Tom until c.1882 when it was replaced by a steam engine.

⁶¹ The head gear was found in its original position but collapsed at the time of the LUAU survey in 1989 (13.2). It has been removed, but is to be reinstated as part of a wider Shropshire Council / SMTL interpretation scheme funded by the HLF (May 2011).



Fig. 30: Detail of mid twentieth-century photograph of Snailbeach Lead Mine showing the Black Tom area (Shropshire Archives PH/S/20/3)

The shaft was used from c.1900 until 1928 by the Halvans Lime Spar and Concentrating Company to mine barites and galena; it is labelled on the 1901 OS map as 'Old Shaft' [Fig. 29]. The ore dressing area was located to the east and was described by Brown as containing jiggers and classifiers for treatment of barites, and Shaw suggests that the classifier was driven by belting from a portable engine; the image in Fig. 31 may show this.⁶²

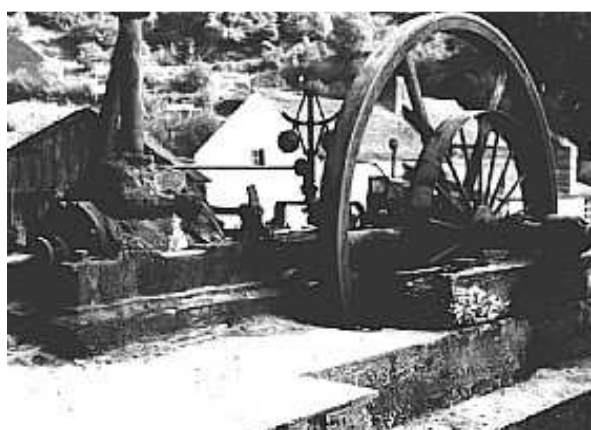


Fig. 31: Photograph of processing equipment at Black Tom

⁶² Brown (1988), pp.22-23; and Shaw (2009), p.81.



Fig. 32: The jigger at Black Tom. It has since been restored and is currently in storage (NMR).

Principal features (see Map 10a)

Black Tom Engine House (13.3)

Probably early to mid C20 and constructed by the Halvans Company. Timber boards with corrugated sheet roof, doorway and driver's viewing window to south elevation. The engine bed and piping from the boiler survive internally, and rope wear can be seen on the window frames.

Scheduled.



Black Tom Shaft (13.1)

1864. At the time of the LUAU survey the surviving headgear had collapsed on to the shaft. This has been removed but is programmed to be reinstated. The shaft has been made safe and a mock collar fitted. Scheduled.



Black Tom ore-dressing plant (30)

Early C20 remains of concrete plinths for machinery connected to the Halvans Company. Scheduled.



Significance**Evidential**

- Black Tom has the potential to yield evidence about the industrial processes and contribute towards the understanding of the site's evolution and the simultaneous workings of different shafts.
- Currently interpretation is difficult as the processes undertaken at the ore-dressing plant are not easily understood to the untrained eye. There is the potential for the site to be further understood through archaeological investigation, informed reinstatement, and vegetation management.⁶³

Historical

- Historical values are not as strong here as in other parts of the site where there is a greater survival of readable built structures.

Aesthetic

- The aesthetic qualities of Black Tom are fortuitous, attributed to the vegetated setting. The dense vegetation currently contributes to Black Tom's character, defining it as an enclosed space, separating it in feel from the core area.

Communal

- Tied up in the significance of the site as a whole (see *Overview of significance*).

⁶³ As part of the HLF project (2011) it is proposed to reinstate the headgear over the Black Tom Shaft and rebuild a shed to house the jigger and classifier. An interpretation board was installed on the engine shed in Summer 2011.

F: Magazine

[Appendix I: Map 9f]

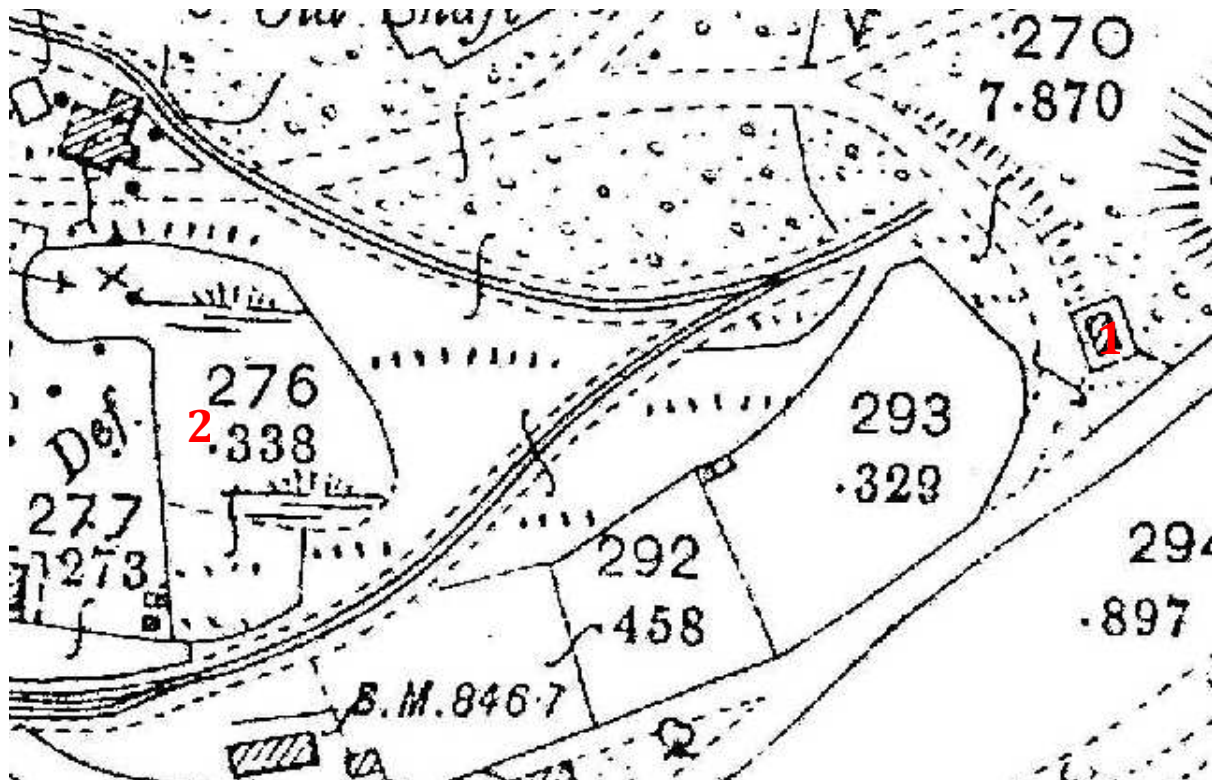


Fig. 33: Detail of 1901 OS map (1:2500) showing the Magazine (1) and Old Reservoir (2)

History and development

The west section of this area has been subject to housing development, although features survive which relate to the earliest phases of mine working. The Old Reservoir is shown in a map of 1766, and subsequent maps show it extended to the south and east. The reservoir would have supplied water to the dressing floors and boilers in the early ore-processing functions. It was superseded by an engineered reservoir located to the north-east in 1872.

Gunpowder was used at the mine from the seventeenth century to drive shafts deeper; it was used to fill holes drilled up to two feet deep in the rock face, initially by hand and later with the assistance of compressed-air drills and dynamite, with the benefit of achieving up to six feet a day. Strands of straw were filled with dynamite for use as fuses. The Magazine's construction is recorded in a daywork book of 1863, and it is depicted on maps from 1864, easily recognisable through its double-walled construction. Located away from the main centre of activity and any housing this construction gave a one-way system for miners getting detonators, explosives and fuses. It probably also would have contributed to reducing the impact of any explosion on the surrounding area.

The Candlehouse was built in the 1870s to make, store and distribute tallow candles used every day in the mines. Miners had to buy these from the mine company, in the 1860s at 8d a pound – sixteen candles. Candles survive in some of the levels, stuck to the walls with

clumps of clay, and recorded as being used as reference points in the mine.⁶⁴ The building is privately owned and is in poor condition although the structure is substantially intact; it is on the Heritage at Risk register at Priority A.

Principal features (see Map 10a)

Old Reservoir (14)

Possibly the earliest visible surface feature on the site. Located to the south of present-day housing and surrounded by vegetation. It occasionally fills with water. Scheduled.



Magazine (15)

Rectangular in plan, single storey, built of coursed stone with double-wall construction and an entrance on the west elevation. The walls were originally timber panelled and the floor covered with bark. It is now roofless and a window opening was filled during consolidation in the 1990s. Scheduled. Grade II listed LEN: 1176660.



Candlehouse (33)

Pre 1864. Square plan, two storeys, built of coursed stone with a slate roof. The building is in a ruinous condition although the roof remains substantially in place. Scheduled. Grade II listed LEN: 1261135. The Candlehouse has been on the Heritage at Risk register since 2008 and is a category A priority.



⁶⁴ Further information on the Candlehouse can be found in Brown, I.J. *Snailbeach Mine stage II study: industrial archaeology aspects of the study area* (1988) which contains an excerpt from C. LeNeve Foster (1894) on the use of the Candlehouse.

Significance

Evidential

- The Magazine area contains substantial evidence related to industrial processes which may help to further understand the site.
- The Old Reservoir is potentially the earliest feature at the mine site, demonstrating early mining processes and planning, and potentially providing evidence of how the scarcity of water at Snailbeach was approached.
- Little is known about the Candlehouse and those that operated it and, coupled with historic research, it has the potential to yield evidence for further understanding.
- The Magazine has the potential to provide information about the construction of such buildings, and as such possibly enhance its significance.

Historical

- The existence of a Candlehouse and Magazine is common in mining areas (e.g. the listed candle storage house at Beaumont Lead Mines, County Durham), but these are specific to Snailbeach and illustrate ways of thinking concerning their construction and planning in relation to the rest of the mine site.
- The use of candles in the mines illustrates the practice of personal lighting for the miners, and their underground survival (although outside of the scope of this management strategy) is evidence of this.
- Similarly the method of driving shafts using explosives is illustrative of such processes.

Aesthetic

- The aesthetic qualities of this area are fortuitous, formed by 'the patina of time' and vegetation. No conscious architectural design was obviously made in the construction of the surviving buildings.
- The practical design of the Magazine provides an interesting addition to the area, especially when viewed from the road above.

Communal

- The communal value of the area is tied up in the significance of the site as a whole (see *Overview of significance*).
 - The Candlehouse will have significance to those connected to the tallow-candle making process, as a traditional craft skill.
-

G: Reservoir

[Appendix I: Map 9f]

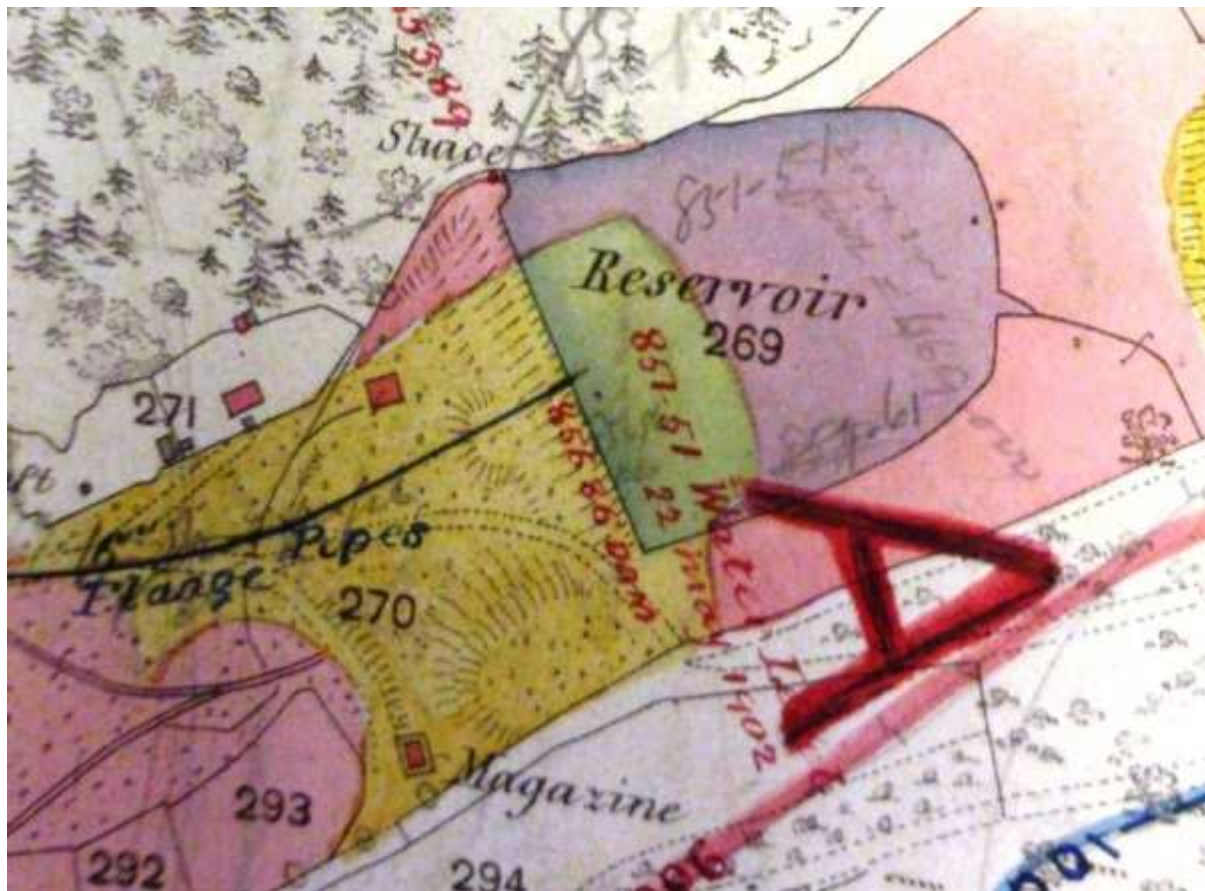


Fig.34: Detail of an annotated 1882 OS (1:2500) showing the Reservoir, water leats and pipes. The miner's cottage, tramway, and valve house are on the left of the image (Shropshire Archives 4743/26)

History and development

The Reservoir was constructed in 1872 under Henry Dennis on the site of a spoil heap - the spoil was used to construct the reservoir dam - as a solution to the mine's water-shortage problems. Mining operations were generally located close to a plentiful water source, and the lack of this at Snailbeach appears to have been an issue from its early years. Shaw suggests that engine boilers and dressing floor processes were partly fed by water piped in from catchments in the surrounding hills and from adits such as at Maddox Coppice; the survival of lengths of three-inch cast-iron pipe may substantiate this.⁶⁵ The 1872 Reservoir was fed from a stream to the south-east of Snailbeach by means of a leat, the route of which can still be traced. The Reservoir was also connected to the Old Reservoir by an overflow channel, traces of which survive running from the north-west end of the dam. The leats are described further in the LUAU report (1990), pp.41-42. The valve house apparently controlled the supply of water to smaller reservoirs 'lower down' although their location has not been identified. Its construction is probably contemporary to the 1872 Reservoir.⁶⁶

⁶⁵ Shaw (2009), pp.77-78.

⁶⁶ Further evidence of the water management system can be obtained from the following maps, located at Shropshire Archives: 4743/26 (Dennis collection) Annotated 1881 1:2500 OS, showing Reservoir, water leats

At the far west end of this area there are a number of other features; the remains of a rectangular stone-built structure and the entrance to a level survive on private land [Figs. 35 & 36]. The LUAU report suggest that the former (described as ‘Building near Valve House’ ref.51) was a miner’s cottage, and it is depicted on both the 1882 and 1901 OS maps with a track leading to it [Fig.32]. Other surviving stonework nearby may be the remains of agricultural buildings and a cobbled yard. The tunnel or level entrance was identified by LUAU as ‘Adit J’ (or ‘Paraffin Level’) and is noted as shown on a mine plan of c.1900.



Fig. 35: Adit J entrance



Fig. 36: Ruins of miner's cottage to north west of valve house

Principal features (see Map 10a)

Reservoir (21)

1872. Constructed under Henry Dennis.
Scheduled.



and pipes. Dated 1883. 4743/29 (Dennis collection) Plan of pipes laid near Chapel Shaft, Jan 30 1875. Stamped by Henry Dennis. Could be contemporary to construction of the reservoir.

Valve house (39)

c.1872. A low, earth covered structure of brick and stone, retaining the main scour pipe and valve internally.

Scheduled.



Significance**Evidential**

- Ground-level features such as leats both in and around this area have the potential to provide evidence and further understanding of the mine's water supply.

Historical

- The Reservoir area contains substantial evidence related to industrial processes and the understanding of the site, especially as water was crucial to ore processing and the functioning of the site, for boilers etc. The survival of the Reservoir and its related functional elements (leats, valve house) illustrates the approach to the lack of a water supply at Snailbeach.
- The Reservoir area also has associative value as it was featured in the 1950 film *Gone to Earth* [Fig. 42].

Aesthetic

- The aesthetic qualities of this character area are *fortuitous*, mainly due to its vegetated setting.

Communal

- The communal value of the area is tied up in the significance of the site as a whole (see *Overview of significance*).
- The reservoir also has amenity value and is used by a local angling club.



Fig. 37: Still from *Gone to Earth* (1950) showing a view over the Reservoir towards Snailbeach mine (www.powell-pressburger.org)

H: Perkins Level & Upper Works

[Appendix I: Map 9h]

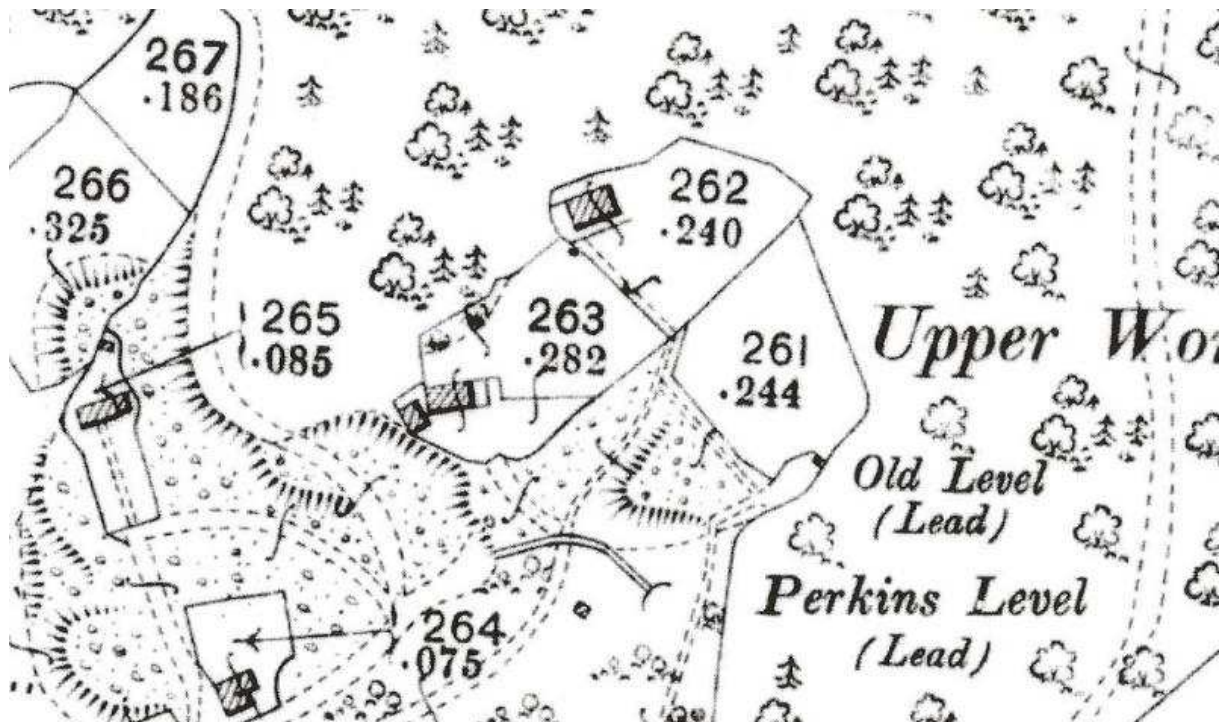


Fig. 38: Detail of 1901 OS map (1:2500) showing Upper Works and levels

History and development

By 1820 there were six levels in the Lordshill area, with mining underway certainly by 1827.⁶⁷ Perkins Level (also known as Robert's Level) adit dates from c.1820, constructed to access the eastern part of the mine and a barites vein excavated in the late nineteenth century. Buildings are shown on the early edition OS maps, and in 1874 Dennis reported exploration here. Barites were worked at Perkin's Level between 1874 and 1876.⁶⁸ The tramway connected the level to the main site.

Upper Works, located between the 1872 Reservoir and Perkins Level, was a post-World War 2 ore-processing plant used to separate calcite from barites. Photographs from the 1960s show the works in a less-decayed state. The plant was powered by a steam engine driving the shaft through the pulleys, one of which has survived and has been reinstated. The Upper Works were connected to the main site by the tramway, which may have been extended when the works were built. Heaps of barites spoil survive nearby.

⁶⁷ LUAU report (1990), pp.21-22

⁶⁸ LUAU report (1990), p.22

Principal features (see Map 10a)

Perkins Level (24)

1820. Stone entrance to portal with modern metal gate. Remains of stone-built structure nearby.

Scheduled.



Upper Works (23)

Mid C20. On a stone-built platform, timber built shed, open on three sides, with corrugated sheet roofing.

Scheduled.



Cottage

Known as Mrs Hewitt's Cottage. Typical 'squatter' type cottage, probably with a single room on the ground floor and two bedrooms on the upper floor. Stone construction with a slate roof and single stack. Modern additions and alterations although locally regarded to be 'complete' internally.

Unscheduled, unlisted. Within the Snailbeach Conservation Area.



Significance

Evidential

- This area has the potential to contain significant archaeological evidence related to industrial processes which help to understand the site, and specifically its yield according to the number of levels opened.
- Upper Works has the potential to reveal further information about the last years of ore processing at Snailbeach through the investigation of earthworks and mineral tips in the area.

Historical

- Connections with the past derive from the survival of visible remains: the buildings at Upper Works have been reinstated, and although they are not of special construction illustrate how simple machinery was housed for mineral processing.
- According to Shropshire Mines Trust sources, barite taken from Perkin's Level was sent to smother fuel cells at the Windscale nuclear reactor accident in 1957; it could therefore have *associative* historic value.

Aesthetic

- The aesthetic qualities of the Upper Works area are principally formed by deterioration and vegetation.

Communal

- Tied up in the significance of the site as a whole (see *Overview of significance*).
-

I: Chapel Shaft

[Appendix I: Map 9i]



Fig.39: Detail of annotated 1882 OS map (1:2500) showing the Chapel Shaft area
(Shropshire Archives 4743.26)

History and development

Located to the east of the main Snailbeach mine the sinking of Chapel Shaft was begun by an adjacent landowner, the Earl of Tankerville, who allowed a lease (possibly in 1859) to cash in on the profits from Snailbeach mine. The Snailbeach Mine Company took over the lease and began sinking a shaft in 1861, initially using a second-hand steam capstan winch off a ship, locally referred to as the 'marine engine'. By the end of 1861, the shaft was down to the 112 yard level. In 1862 a small engine house was built for a horizontal steam engine. In 1863, a Parliamentary Enquiry into the condition of mines in Great Britain described Chapel Shaft as '340 yards deep, cutting the vein at 280 Yard Level. Used for drawing - done by skips on 1 1/4" wire ropes'. The shaft ultimately reached the 342 yard level.

Although there were lead deposits east of Chapel Shaft in Tankerville's land, the continuation of the lead veins was found not to run as far as expected, as the land comprised Stiperstones quartzite rather than the mineral-bearing Mytton Flags. In the early 1900s, the Earl demanded unrealistic royalties which forced the company to terminate the lease.⁶⁹

⁶⁹ Information supplied by Shropshire Mines Trust Ltd.

The area around Chapel Shaft and slightly to the north was used during the filming of *Gone to Earth* by Powell & Pressburger in 1950.⁷⁰ The LUAU report suggests that one shaft (ref.25.1) was constructed for the film, but on examination this shaft appears to be closer to Chapel Shaft than depicted in the film. The engine house is extant in the film, and the former Methodist Chapel featured prominently as the home of Reverend Edward Marston.



Fig. 40: Filmstill from *Gone to Earth*, showing the extant engine house, and a fake chimney and headgear (www.powell-pressburger.org)



Fig. 41: Filmstill from *Gone to Earth*, showing the surviving chimney, and a fake chimney and 'mineshaft' (www.powell-pressburger.org)

Chapel Shaft is not protected by scheduling although some of the structures are listed. The site lies within Stiperstones and Hollies SSSI and is part of the character of the area, managed by Shropshire Wildlife Trust and Natural England. A small parking area adjacent to the engine house is also used for onward access by foot to the Blakemoorgate settlement.

Principal features (see Map 10b)

Shafts

The shafts in the immediate vicinity of the Chapel Shaft chimney have been capped, some with grilles to let bats in and out. The principal shaft is located at SJ3809702112.



⁷⁰ The film was an adaptation of Mary Webb's novel of 1917 of the same name, in which she extensively drew on her relationship with the county and in particular this area around the Stiperstones. Many local people were used as extras in the film.

Engine house (27.3)

1862. The remains of a stone-built structure at the bottom of the slope to the north of the chimney. An extant engine house which featured in the 1950 film *Gone to Earth* may be this structure.



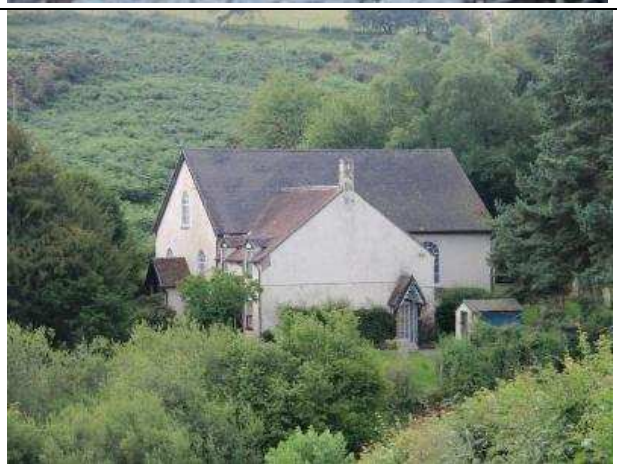
Chimney (28)

c.1860-70. Reddish brown brick on chamfered plinth with stone capping. Square section tapering to top. Featured in 1950 film *Gone to Earth*. Listed Grade II LENO: 1366970.



Former Baptist chapel

1873.
Extensively featured in the works of Mary Webb and in the 1950 film *Gone to Earth*.
Listed Grade II LENO: 1055006.



Significance

Evidential

- Chapel Shaft has the potential to reveal further evidence about the mine's 'adventuring' in the later nineteenth century, and also any changes in methods used outside of the main mining area (Shropshire Archives 4743.26 and 4743.29).
- The archaeology of the remains of the small engine house are worthy of investigation, as are the remains of a water management system depicted on annotated OS mapping for the construction of the reservoir.

Historical

- The survival of the Chapel Shaft chimney is illustrative of the mine's processes, and the engine house and chimney are connected underground by a brick flue.
- The mining area at Chapel Shaft has significant associative value, initially as the setting used by Mary Webb in her novel *Gone to Earth* in 1917, and later as authentic scenery in the 1950 film by Powell & Pressburger [Figs 36 & 37]. Additional 'fake' features were constructed for filming, but these have apparently been removed. Lordshill Chapel was used in the film as the home of the minister Edward Marston.⁷¹
- Mary Webb renamed Lordshill 'God's Little Mountain': 'The chapel and minister's house at God's Little Mountain were all in one – surrounded by the graveyard, where stones, flat, erect, and askew, took the place of a flower garden. Away to the left, just over a rise, the hill was gashed by the grey steeps of the quarries. In front rose another curve covered with thick woods...Behind the house God's Little Mountain sloped softly up and away apparently to its possessor.'⁷²

Aesthetic

- The aesthetic qualities of Chapel Shaft are fortuitous, formed by the undulating topography, vegetation and positioning of buildings in the landscape.
- There are some design elements to the Methodist Chapel which evoke an aesthetic response.
- The graveyard associated with the chapel also has atmospheric qualities.

Communal

- The area will have value to those who were cast as extras in the film *Gone to Earth* in 1950.
- The graveyard at Lordshill Chapel contains the grave of a miner killed in an accident at Snailbeach mine, Arthur Wardman, and will also contain the graves of relatives of surviving generations.
- The chapel will also have spiritual value to those who worshipped and went to Sunday school there.
- Additionally, the area will have strong biodiversity value, and the graveyard may be locally important for flora and fauna.

⁷¹ For further filmstills from *Gone to Earth* in 1950 see:

http://www.powell-pressburger.org/Images/50_GTE/Scans/index.html

⁷² Webb (2010), p.56.

J: Snailbeach New Smeltmill

[Appendix I: Map 9j]

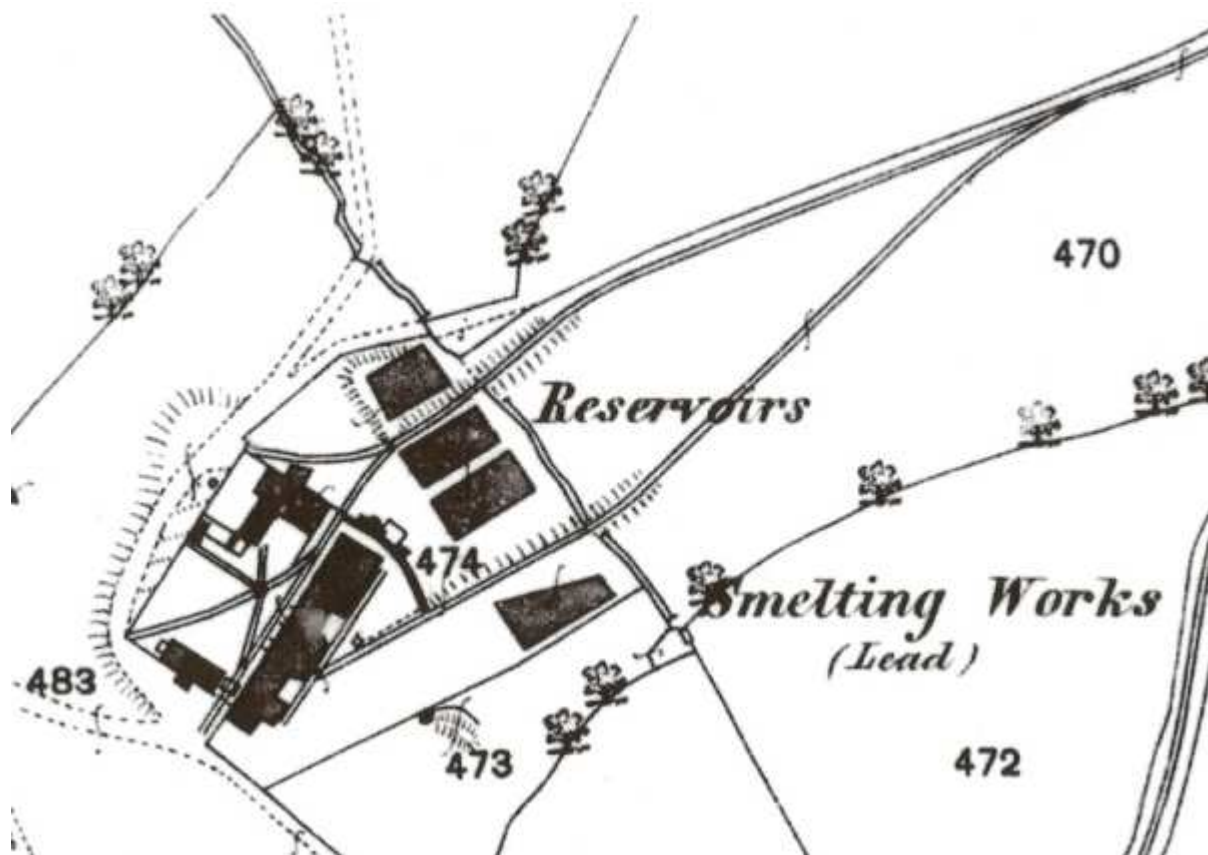


Fig.42: Detail of 1882 OS map (1:2500) showing the New Smeltmill

History and development

The lead ore from Snailbeach was sent to various places before a local smelter was built, including to premises in Wrexham, Malehurst and Deeside. The first smelters serving Snailbeach were constructed at Pontesford under Thomas Lovett in around 1784 following his acquisition of the Nag's Head Colliery.⁷³ Coal for the Pontesford smelters was supplied from the nearby Nag's Head Colliery, but this closed in 1862 on the surrender of the lease and with the availability of better-quality coal from other parts of Shropshire. The smelters were also abandoned in 1862 in favour of a reverberatory mill, and probably in favour of safer premises where the lead fume could be dispersed away from settlements.⁷⁴

The New Smeltmill was built in 1872 around 0.75 miles north of the Snailbeach mining site. It was served from 1877 by the SDR, connecting it to both the main mine site and to Pontesbury Exchange Sidings, for transfers of coal from elsewhere and for smelted lead to be transported to Shrewsbury [Fig. 43].

⁷³ Described in: L. Moissenet, 'Traitement de la Galene au Tour Gallois' in *Annales des Mines*, 6th series, tome I (1862) and also as transcribed by H.M Martell & M. Gill 'Lead Smelting in Welsh Furnaces at Pontesford, Shropshire' in *Bulletin on the Peak District Mines Historical Society* Vol. II, Number 6 (Winter 1992), pp.297-312.

⁷⁴ See *Snailbeach Lead Mine, Shropshire* (2008), pp.23 & 26 for a nineteenth-century account of the Pontesford smelters and the consequences of their noxious fumes.

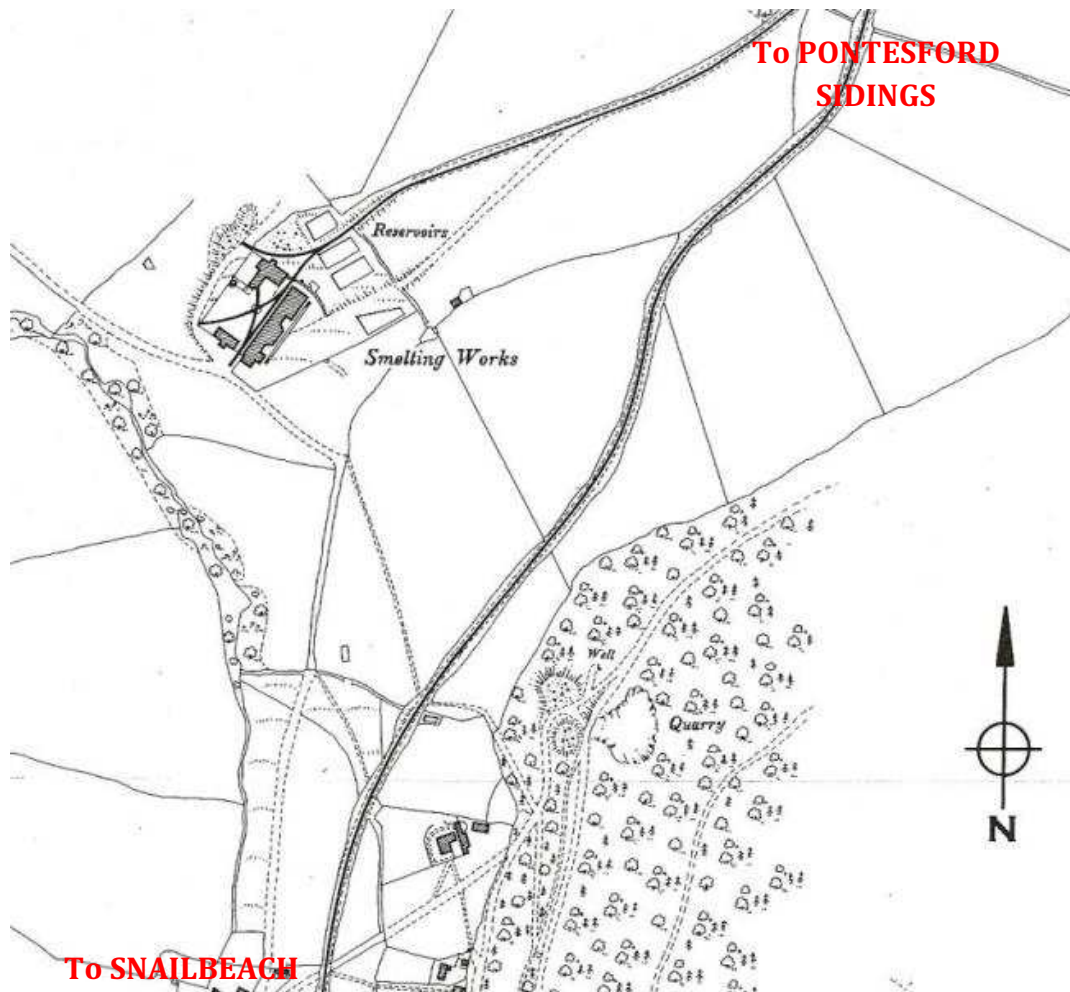


Fig. 43: Drawing based on 1902 OS map showing the railway arrangement to the New Smeltpill

The New Smeltpill complex is believed to have originally housed at least four reverberatory furnaces and a roasting hearth in the slagmill. The smeltpill furnaces were charged from above as they were built into a higher terrace served by a short tramway. Five flues exited the rear (east) of the mill area from where they ran to an underground condensing chamber, approximately 50m to the southeast, and then along a single flue south to Resting Hill chimney where the fumes were discharged; the chimney also acted as a draw for the furnaces. The walls of the tunnel acted as a condenser, from which substantial amounts of lead would be scraped off the walls; records suggest 62 tonnes of lead were removed in May 1872.

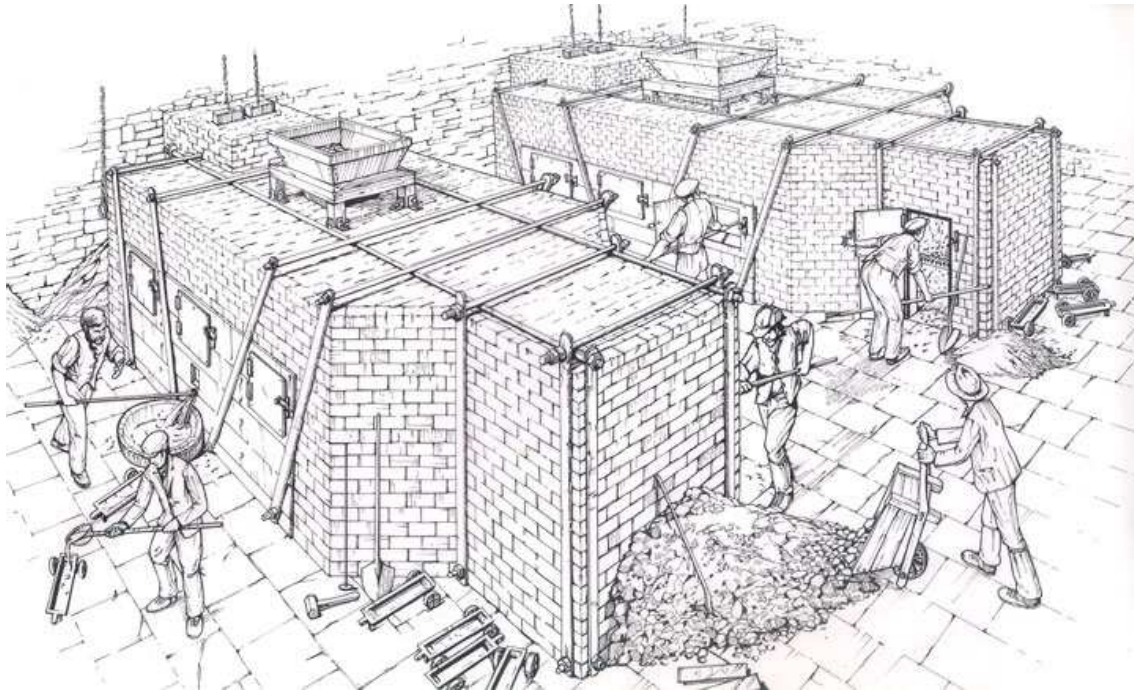


Fig. 44: Illustration of the cupola smelt mill at Grassington in Yorkshire; the Snailbeach smelter was probably very similar (www.outofoblivion.org.uk)

Reverberatory furnaces effectively removed lead from ore, but the slag was still rich in metal and was invariably reworked in a slagmill. Snailbeach slagmill is a barn-like building situated to the north of the remains of the smelter furnaces, and internally retains evidence of the processes, including two parallel cross walls within which the hearth may have been set. The brick flue from the slagmill can be traced in various parts of the site, running towards the condenser. A steam engine or boiler may have been located externally adjacent to the north wall to provide a blast (rather than a draught). Water for the processes was made available from four reservoirs located to the north east of the slagmill, terraced into the hill slope [Fig.38]. Slagtips and other evidence of the site's processes remain today, including a tip to the east beyond the boundary wall and outside of the scheduled area, where slag can still be found. The complex is bounded by a high stone wall, probably as a protection from the wind and as a means of defining property. The residential building 'Lower House' was the Mine Office, and possibly also provided accommodation for workers; this is undesignated and is not covered in this report. A privy against the east wall is probably contemporary to the complex.

The closure of a major client, Burr Brothers of Shrewsbury, and a decline in the demand for lead resulted in the closure of the smeltmill in 1895; it had operated for only 33 years. The flue was partially demolished but Resting Hill chimney remained in use serving the winding and pumping engines there until 1911.⁷⁵

⁷⁵ Information on lead smelting can be found in a variety of sources, including the historic Percy's *Metallurgy* which describes the processes of different hearths. Shropshire lead smelters (possibly those at the New Smeltmill) are discussed in 'Notes on lead smelting' from *The Handbook of Metallurgy* by Schnabel & Lewis (1898), which has recently been reproduced in the Shropshire Mines Trust Newsletter, No.57 (Winter 2010), and is available online <http://www.shropshiremines.org.uk/smt/smtnewsletter/News57.pdf>

Principal features (see Map 10c)

Slagmill

1862. Roughly-coursed rubblestone with brick dressings. Internal divisions survive and may represent different processes. Now used for storage.

Scheduled and Grade II listed LEN: 1307989.



Smeltnill and flues

1862. A rectangular enclosure bounded by rubblestone walls to the north, south and west. The building is constructed against a slope on a levelled terrace and evidence survives of furnaces and flues. Ruinous and much overgrown.

Scheduled, and five of the flues are also listed Grade II LEN: 1055031.

The smeltnill is on the Scheduled Monuments at Risk register.



Privy

Brick and stone privy with a slate roof located against the north boundary wall. Two rooms internally, one retaining a timber lavatory bench seat.

Scheduled.



Reservoirs

1862. The earthwork remains of at least four reservoirs are visible to the north east of the site.
Scheduled.



Boundary wall

1862. High, stone boundary wall running along the east of the site. Gated entrance at north end, and connected to Lower House at the south. Evidence remains of whitewash on the west face. The wall was probably for protection from westerly winds and for security.
Scheduled.



Significance

Evidential

- This area has the potential to contain significant archaeological evidence related to the industrial processes used in the slag mill and smelting, current hidden by extensive vegetation and ground cover. Investigation will help to understand the site, and contribute to placing the smelting into the national history of lead processing.
- As yet undiscovered evidential remains of the reservoirs and tramway have the potential to further understand water management and transport, the latter clarifying connections to the main Snailbeach site.

Historical

- Connections with the past derive from the survival of visible remains: the slagmill is a substantial building with much internal evidence ready for investigation and thus furthering understanding and interpretation to connect the site to the past.
- The remaining visible evidence, as above, requires exposure before all elements of the site and their relationships are fully understood.

Aesthetic

- The aesthetic qualities of the New Smelting are principally formed by deterioration and vegetation.

Communal

- This is tied up in the significance of the site as a whole (see *Overview of significance*), although due to the distance of the Smeltnill from the main mine site, it is less-readily interpreted.

5. STATEMENT OF SIGNIFICANCE

Located within the wider Shropshire ore field and at the foot of the Stiperstones, Snailbeach Lead Mine is a large, centralised, complex mine, with remains from the late eighteenth to the mid twentieth century. It is an excellent showcase of the lead-mining industry's technical evolution with steam for winding, crushing and pumping and the use of compressed air and railways.

Mining may have taken place at Snailbeach from the Roman period, but the first clear documentary evidence dates from the seventeenth century and the earliest surviving remains are from the late eighteenth century. However, there is the potential for early archaeological evidence which may enhance understanding and increase our link with the past. The most productive era of lead-mining at Snailbeach was the 1840s and 1850s when the mine produced over 3,000 tonnes of lead ore per year. In 1875 it produced over 10% of UK lead ore and by 1914 about 25% of UK barites. Mining operations at Snailbeach ceased in 1955, although the waste tips were continued to be worked for aggregates and spar. Snailbeach was the biggest and richest mine of the Shropshire ore field, and in many ways typified the Shropshire mines. It is certainly the best preserved in the county. Until a period of land reclamation in the 1990s the mine's massive waste tip - 'White Tip' - was an important feature in the local landscape, but the mine site continues to relate to the broader issues in the economic and social history of Shropshire.

The importance of Snailbeach is reflected in its designation as a Scheduled Ancient Monument (SAM), and eleven structures within the SAM are listed grade II. However, it is not just the historic environment which makes the site significant: the underlying geology was the reason for the mine's existence and as such it is now designated as a Local Geological Site with parts of the White Tip a Site of Special Scientific Interest (SSSI). There are also a variety of natural environment designations, and a number of UK Biodiversity Action Plan (BAP) species thrive in the area. Dormice, grayling butterfly and bats are among the protected species sighted at Snailbeach.

The significance of Snailbeach Lead Mine has been assessed using the English Heritage's *Conservation Principles*, which divide the values of the place into evidential, historical (illustrative or associative), aesthetic (fortuitous or designed) and communal value. The site's key significances and their place in a national context can be summarised as having:

National significance due to its evidential value – recognised through designation as a scheduled ancient monument and recognition of its geological importance, the key factor for the mine's existence.

National significance due to its historical values – multifaceted mining history recognised through designation as a scheduled ancient monument. The survival of a wide range of structures contributes to our understanding of the mine's development and historic process and as such an understanding of our past.

The mine's social history also has **regional** and **local** significance, attributed mainly through its historic and communal values.

Snailbeach also has **regional** significance through its associative historic value, and the Stiperstones were used by Mary Webb as source material in her novel *Gone to Earth* (1917) and the area (including Snailbeach, and more specifically Chapel Shaft) was used by Powell & Pressburger as a filming location for a production of the same name in 1950. The children's author Malcolm Saville also used the Stiperstones and the Shropshire mining areas as locations for his 'Lone Pine' books in the post-war years.

Local significance due to its aesthetic values – in the typical sense of the word the mine site is not concerned with beauty, and much of its aesthetic is fortuitous, gained through its abandonment and return to nature.

National significance due to its communal value – a strong perceptible example of the social history particular to a place created by industry. However, in some ways it is of local significance as understanding may not be appreciated or perceived by those from outside the area.

Priorities for appropriate conservation are as follows:

- **WHITE TIP** – preservation of archaeology and structures essential. Health and safety has precluded archaeological considerations in terms of its historic character. Management of the SSSI and the habitat of BAP priority species should also be actively continued. Interpretation should be enhanced where appropriate. There may be evidence of **Roman mining activity** beneath the White Tip.
- **CORE AREA** – preservation of character, archaeology and structures essential. Structures should be conserved and interpretation enhanced where appropriate. Highest density of remains. Landmark features. The **Old Engine House** is perhaps the **earliest built structure** surviving at the site. It was probably built to house the mine's first steam engine - a Boulton & Watt engine is known to have been installed in 1797.
- **RESTING HILL** – preservation of character, archaeology and structures essential. Landmark features. Structures should be conserved and interpretation enhanced where appropriate.
- **ORE HOUSE** - preservation of character, archaeology and structures essential. Structures should be conserved and interpretation enhanced where appropriate.
- **BLACK TOM** - preservation of character, archaeology and structures essential. Structures should be conserved and interpretation enhanced where appropriate.
- **MAGAZINE** - preservation of character, archaeology and structures essential. Structures should be conserved and interpretation enhanced where appropriate. The **Old Reservoir** is perhaps the **earliest visible feature** surviving at the site and is depicted on a map of 1766.

- RESERVOIR - preservation of character, archaeology and structures essential. Structures should be conserved and interpretation enhanced where appropriate. Reservoir and valve house date from 1872 and are important to the integrity of the site.
- PERKINS LEVEL and UPPER WORKS - preservation of character, archaeology and structures essential. Structures should be conserved and interpretation enhanced where appropriate.
- CHAPEL SHAFT - preservation of character, archaeology and structures essential. Structures should be conserved and interpretation enhanced where appropriate. The area is currently unscheduled. The **former Chapel** and the immediate area have particular historic associative significance due to its **connections with Mary Webb** and the filmmakers **Powell & Pressburger**.
- NEW SMELTMILL - preservation of character, archaeology and structures essential. Structures should be conserved and interpretation enhanced where appropriate. Arguably, the **New Smeltnill site is the best example of its kind in the country**.

6. RELEVANT POLICIES & GUIDANCE

6.1. Policy

National

- Ancient Monuments and Archaeological Areas Act 1979 (as amended)
- Planning (Listed Buildings and Conservation Areas) Act 1990
- Town and Country Planning Act 1947
- Mines and Quarries Act 1954
- Wildlife & Countryside Act 1981 (as amended)
- Countryside and Rights of Way Act 2000
- Natural Environment and Rural Communities Act 2006
- National Planning Policy Framework – draft (2011)
 - A new draft planning policy framework designed to replace the current Planning Policy Statements (see below).
 - Paragraphs 176-191 relate to the historic environment
 - Much of the document will relate to planning proposals as it replaces the separate statements highlighted below.
- DCLG *Planning Policy Statement 1: Delivering Sustainable Development* (2005)
 - PPS1 addresses sustainability and social inclusion in new development proposals. Of specific relevance are paragraphs 17-20.
- DCLG *Planning Policy Statement 5: Planning for the historic environment* (2010)
 - PPS5 is the chief policy document for the management of the historic environment. It is supported by an English Heritage-produced guidance document (see below).
- DCLG *Planning Policy Statement 7: Sustainable Development in Rural Areas* (2004)
 - PPS7 takes the policies outlined in PPS1 and applies them to rural areas, specifically ensuring that a good balance is struck between open spaces and the countryside, and sustainable and flourishing communities.
 - Of specific relevance to the historic environment are paragraphs 12, 13, 15-17, 21-23, 34.
- DCLG *Planning Policy Statement 9: Biodiversity and Geological Conservation* (2005)
 - PPS9 sets out the Government's vision for conserving and enhancing biological diversity in England, with a broad aim that planning, construction, development and regeneration should have minimal impacts on biodiversity and attempt to enhance it where possible.
 - Due to the range of biodiversity and geological significance at Snailbeach this policy should be considered as equal to the weight given by the policies in PPS5.
- DCLG *Planning Policy Guidance 17: Planning for Open Space, Sport and Recreation* (2002)
 - Snailbeach is a Shropshire Council Countryside Recreation Site and its recognition as such should be carefully considered when proposing development or significant managerial change.

Regional policy

- West Midlands Regional Assembly: West Midlands Regional Spatial Strategy
 - Higher-level planning policy framework for a range of targets.
- English Heritage *Putting the Historic Environment to Work: a strategy for the West Midlands 2010-2015* (2010).
- English Heritage West Midlands Action Plan 2010-11
 - Understanding of the relationship between the historic and natural environment is a key task

Local policy

- Shropshire Council: Core Strategy 2006-2026 (development plan document adopted 2011)
 - Challenges identified illustrate the need for balancing, for example, housing needs with sustainability and the protection and enhancement of the natural and historic environment (p.31).
 - The Spatial Vision identifies the need for self-supporting and sustainable rural communities, and also the protection, restoration and enhancement of Shropshire's natural and historic environment its 'greatest asset' (p.34).
 - KEY POLICIES related to the conservation of Snailbeach Lead Mine: (Objective 11) CS2, CS3, CS4, CS5, CS6, CS8, CS9, CS16, CS17. The latter is of specific importance, but policies related to rural development and housing provision will also be important to safeguarding the environmental qualities of Snailbeach.
- Shropshire Council: Minsterley and Pontesbury and surrounding area Place Plan (2011/12)⁷⁶
 - Within the Place Plan Snailbeach has been identified as a Community Cluster.
 - Comments on the Site Allocations & Management of Development (SAMDev) included improvements to roads and no large-scale housing development.
 - This management strategy is included in the Infrastructure and Investment Delivery Framework under 'Environment and Climate Change' (p.62).
- Shropshire Geodiversity Action Plan (2007)

6.2. Guidance

National guidance

- Defra *Local sites: guidance on their identification, selection and management* (2006)
- English Heritage PPS5 practice guide (2010)
- English Heritage *Conservation Principles, Policies and Guidance* (2008)
- English Heritage *Guidance on the management of conservation areas* (2006)
- English Heritage *Ivy on Walls* (2010)
- English Heritage/GHEU *Managing heritage assets: guidance for government departments on the use of periodic inspections, forward work plans and asset management programmes* (2009)
- English Heritage *Managing local authority heritage assets: some guiding principles for decision-makers* (2003)
- English Heritage *Outstanding beauty outstanding heritage: AONBs and the historic environment* (2005)
- English Heritage *Re-Arch: English Heritage policy statement on restoration, reconstruction, and speculative recreation of archaeological sites including ruins* (2001)
- English Heritage *Science for historic industries: guidelines for the investigation of 17th- to 19th-century industries* (2006)
- English Heritage *Soft capping historic walls* (2009)
- English Heritage *Streamlining listed building consent. Lessons from the use of management agreements* (2003)
- English Heritage *Understanding historic buildings: a guide to good recording practice* (2006)

⁷⁶ [http://shropshire.gov.uk/planning.nsf/viewAttachments/EWET-8F9LRT/\\$file/minsterley-and-pontesbury-2011-2012.pdf](http://shropshire.gov.uk/planning.nsf/viewAttachments/EWET-8F9LRT/$file/minsterley-and-pontesbury-2011-2012.pdf)

- English Heritage *Understanding the archaeology of landscapes* (2007)
- English Heritage *Understanding place: historic area assessments - principles and practice* (2010)
- Entec *Treatment of disused lead mine shafts: a guide to good practice* (2007)

Note: all English Heritage guidance documents listed above and more are available through the Historic Environment Local Management (HELM) website:

<http://www.helm.org.uk/server/show/nav.19702>

APPENDICES

Appendix 1: Maps

- Map 1: Location
- Map 2: Shropshire Council ownership boundary
- Map 3: Snailbeach core site area
- Map 4: Snailbeach Conservation Area
- Map 5: Shropshire Hills Area of Outstanding Natural Beauty
- Map 6: Snailbeach Site of Special Scientific Interest
- Map 7: Stiperstones and Hollies Site of Special Scientific Interest
- Map 8: Shropshire Hills Special Area of Conservation
- Map 9: Snailbeach Lead Mine character areas
 - Map 9a: White Tip
 - Map 9b: Core area
 - Map 9c: Resting Hill
 - Map 9d: Ore House
 - Map 9e: Black Tom
 - Map 9f: Reservoir
 - Map 9g: Magazine
 - Map 9h: Perkins Level and the Upper Works
 - Map 9i: Chapel Shaft
 - Map 9j: Snailbeach New Smeltpmill
- Map 10a: Snailbeach Lead Mine principal features (see separate document)
- Map 10b: Chapel Shaft principal features
- Map 10c: Snailbeach New Smeltpmill principal features

Appendix 2: Designation descriptions

- Scheduled Ancient Monuments
- Listed buildings
- SSSI citations

Appendix 3: Species record

Appendix 4: Glossary and summary of lead-mining process

Appendix 5: A note on subterranean archaeology

Appendix 6: Sources

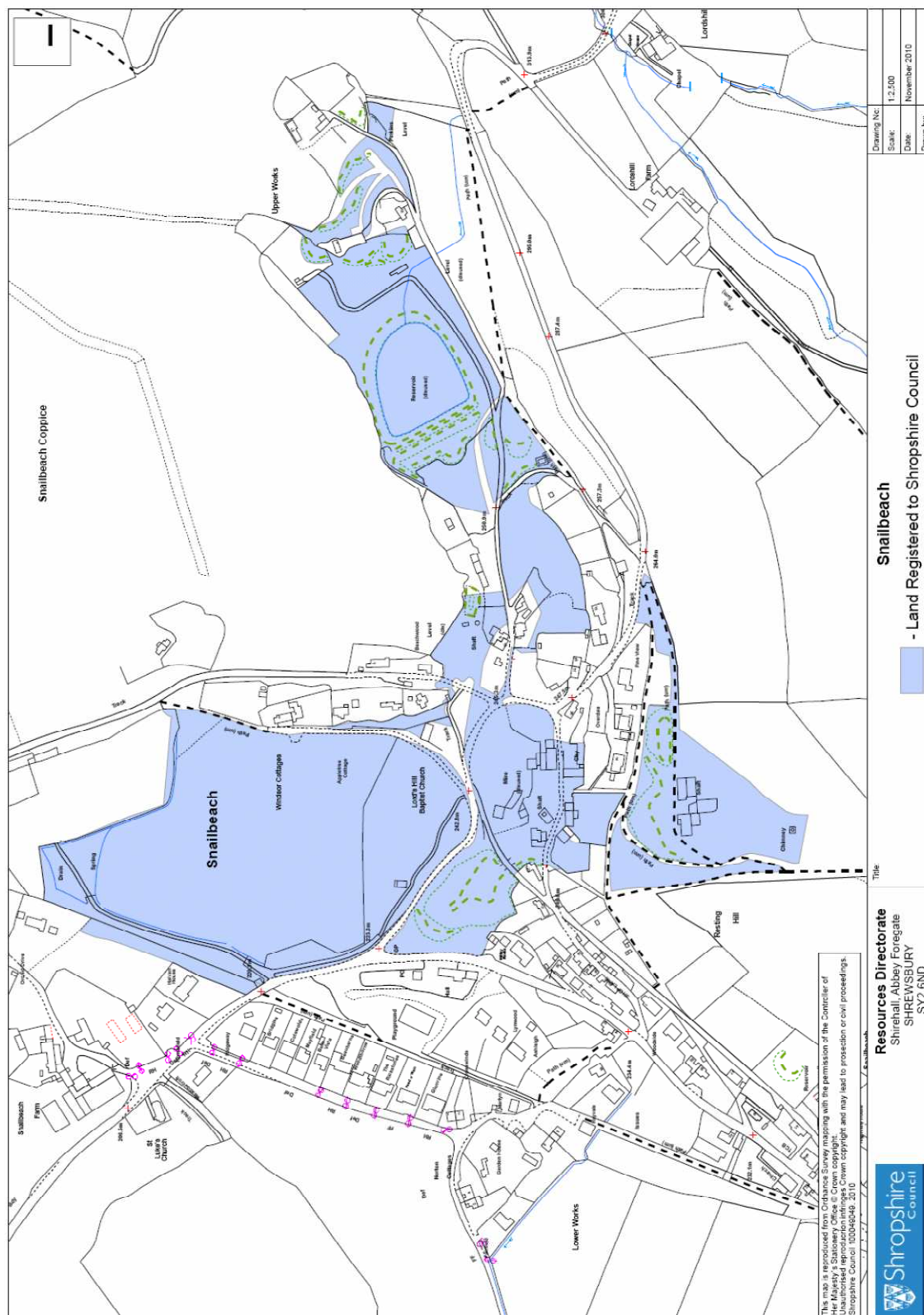
APPENDIX I: MAPS

Map I: Location

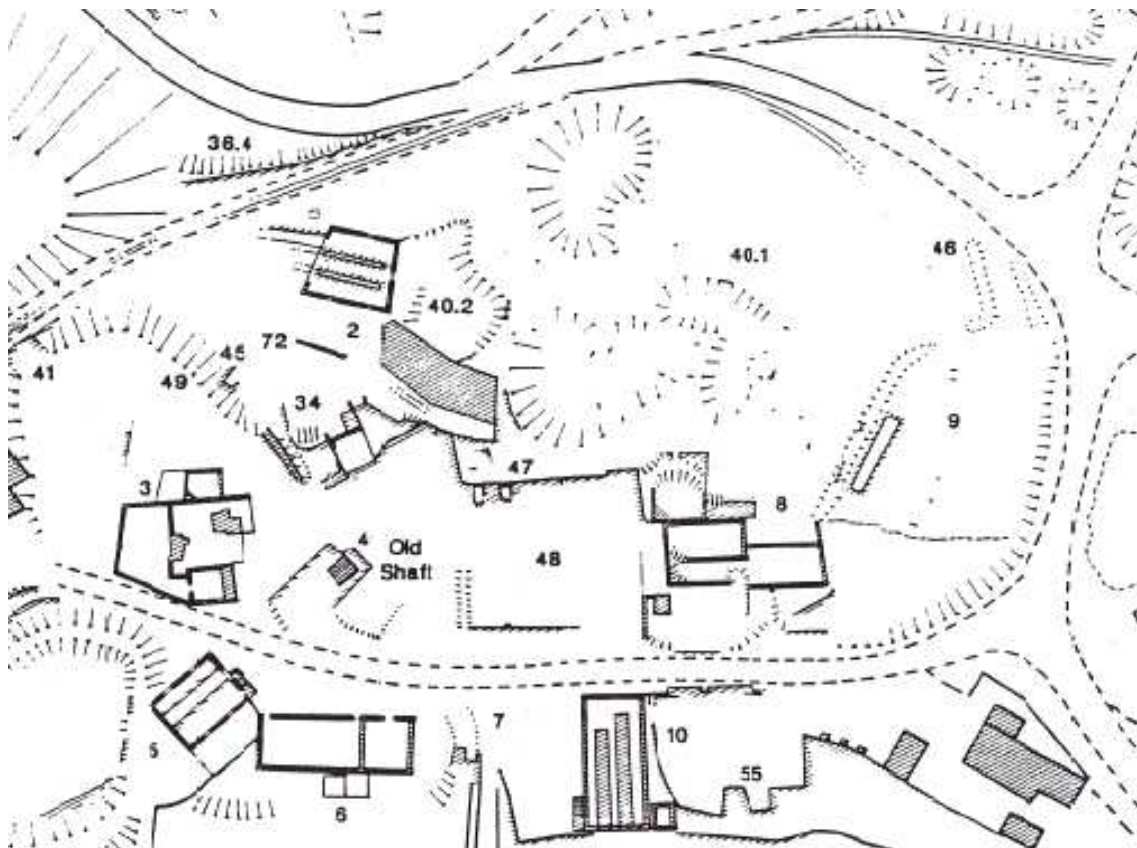


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Map 2: Shropshire Council ownership boundary (November 2010)

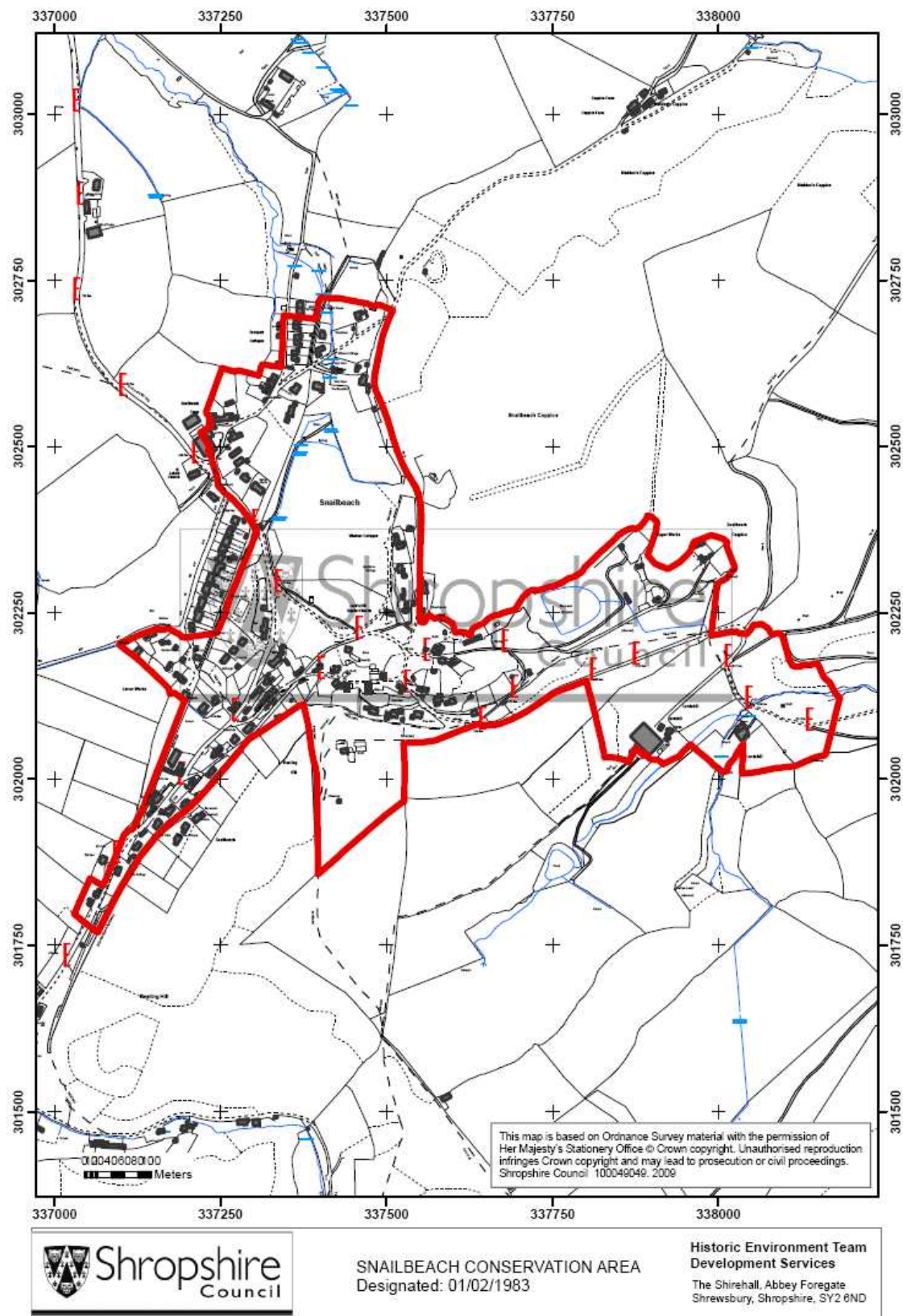


Map 3: Snailbeach core area

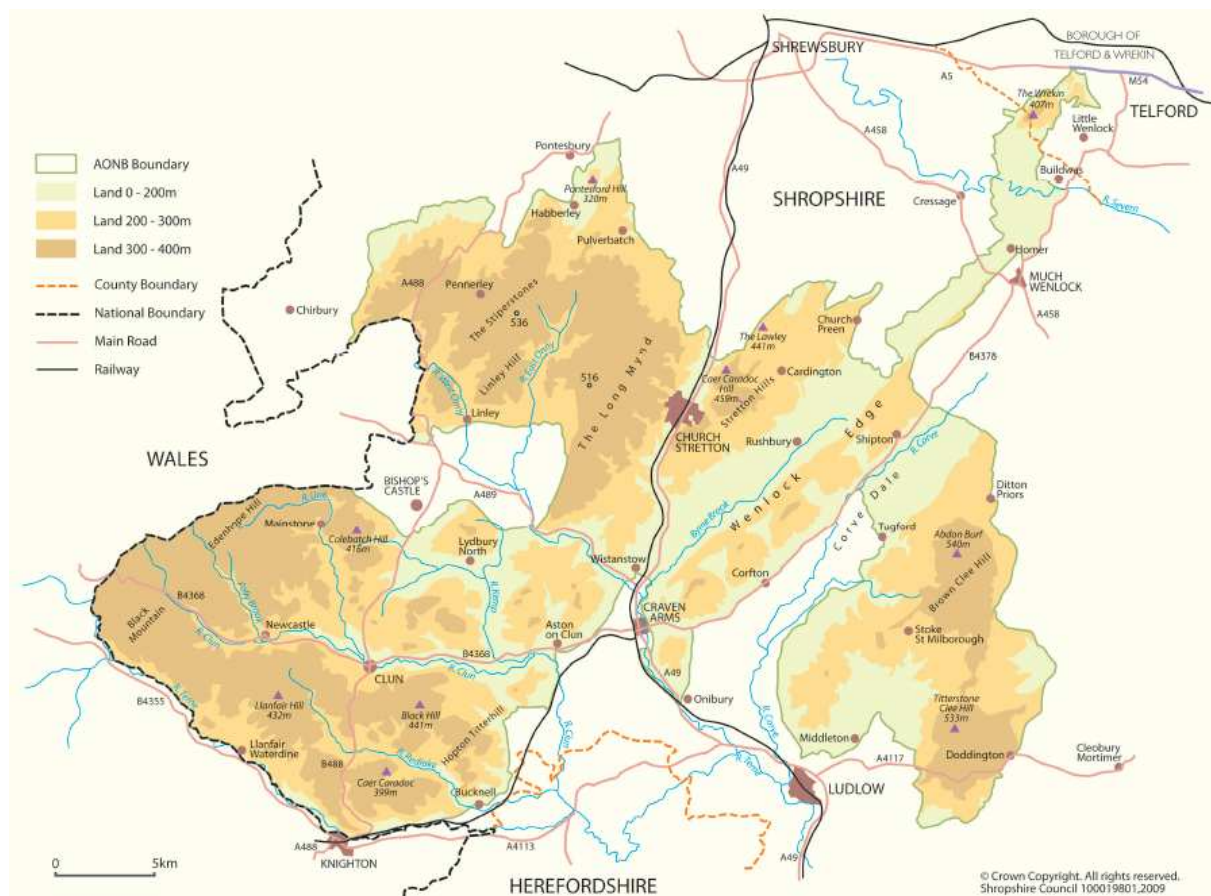


(from LUAU report (1990), Vol. I)

Map 4: Snailbeach Conservation Area



Map 5: Shropshire Hills Area of Outstanding Natural Beauty



Source: <http://www.shropshirehillsaonb.co.uk/about-the-aonb/map/>

Map 6: Snailbeach Mine SSSI

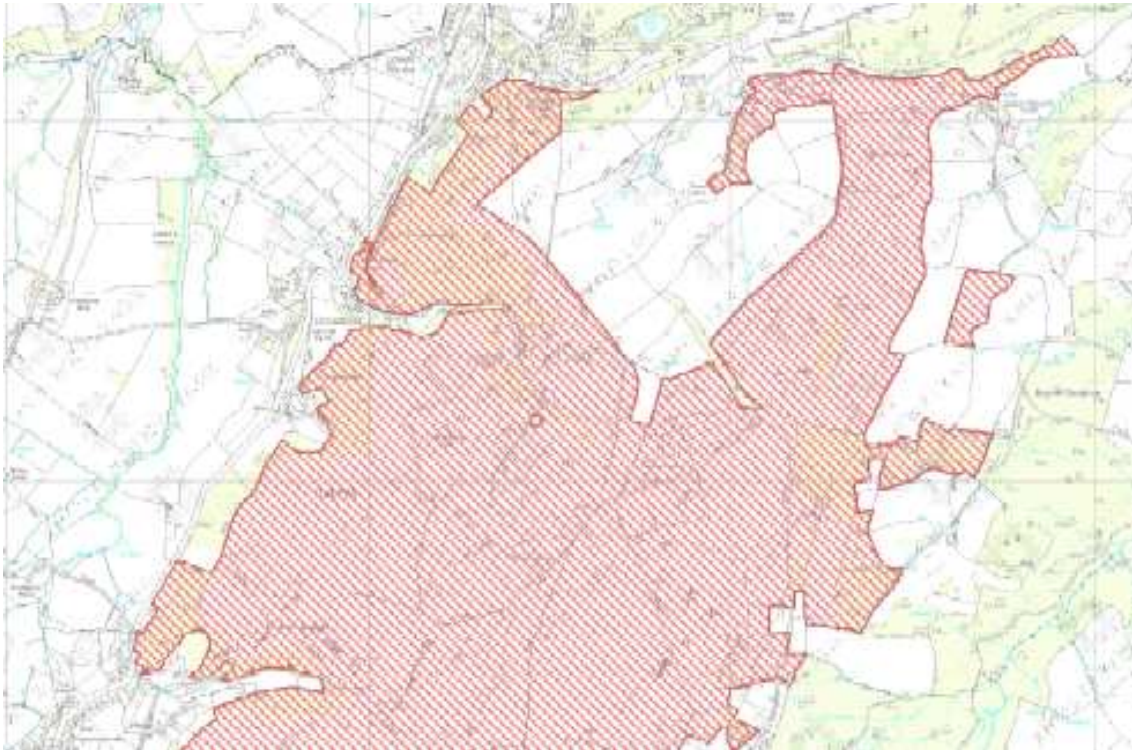


Map 7: Stiperstones and Hollies SSSI



Source: <http://www.natureonthemap.naturalengland.org.uk/>

Map 8: Shropshire Hills Special Area of Conservation
(part)



Source: <http://www.natureonthemap.naturalengland.org.uk/>

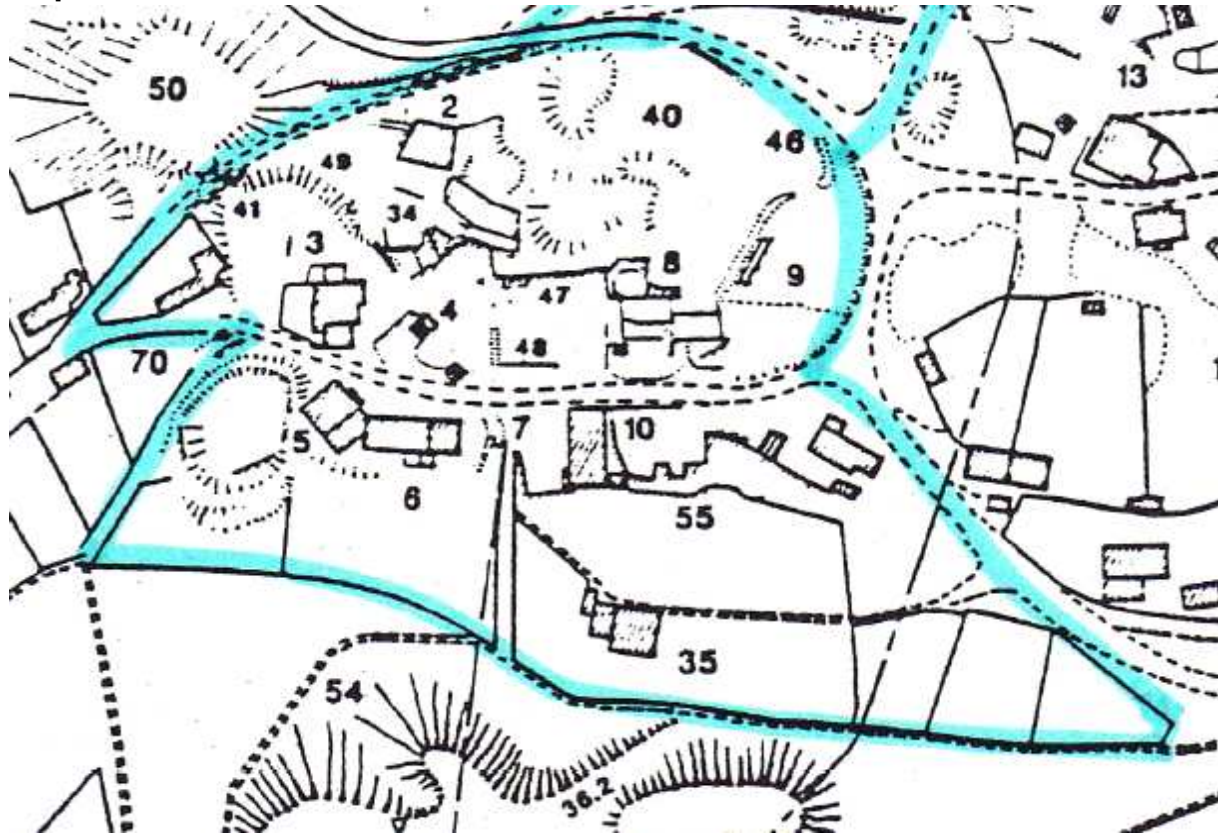
Map 9a: White Tip



KEY

- 1 Halvans engine house
- 36.1 SDR main road bridge
- 37 White Tip spar processing area
- 43 White Tip mineral dressing floor
- 50 Spoil heap ('Black Tip')
- 56 White Tip mineral dressing floor
- 64 White Tip

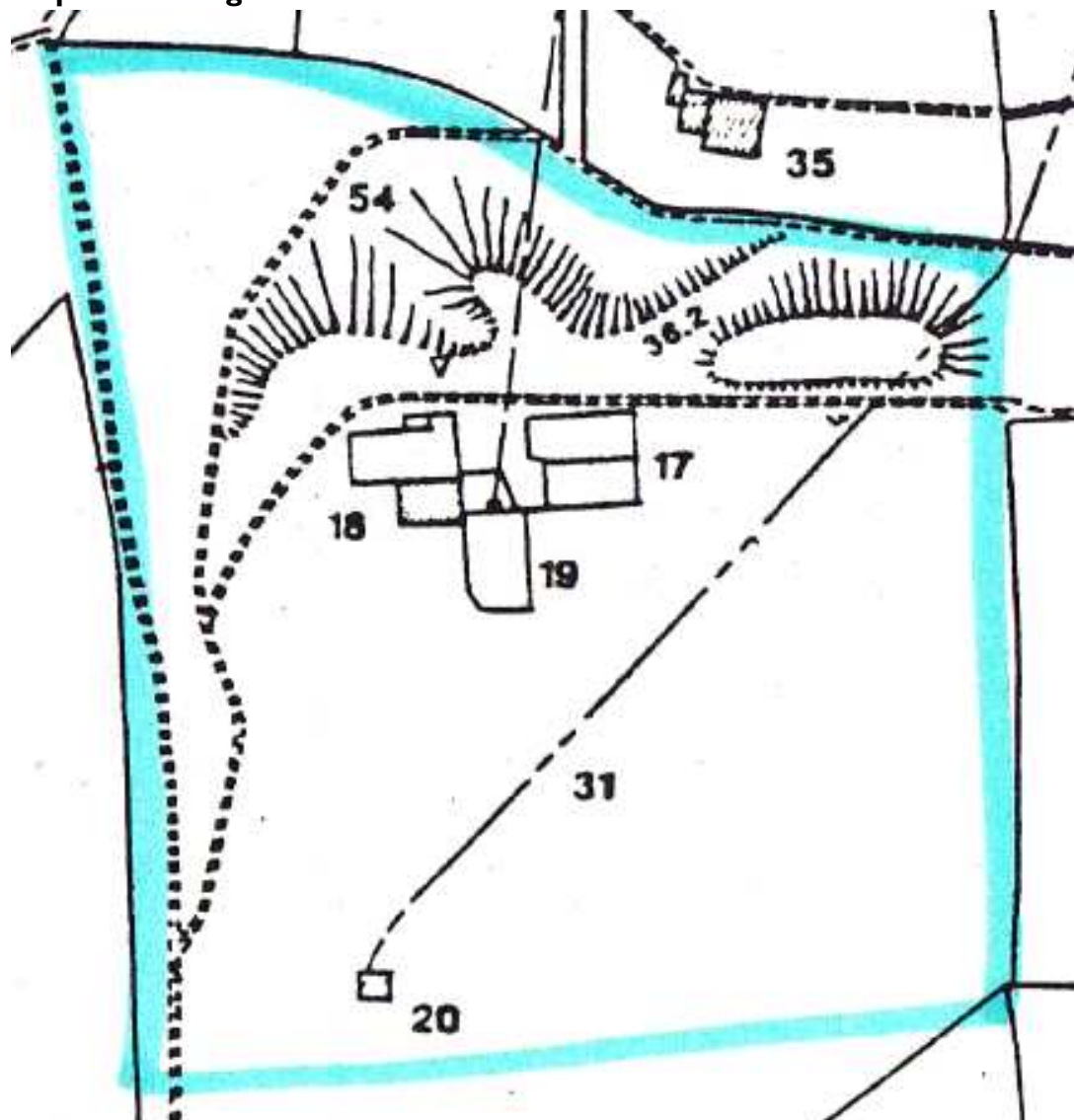
Map 9b: Core Area



KEY

- 2 SDR locomotive shed area: locomotive shed (2.1), concrete platform (2.2), rail terminus (2.3)
- 3 Blacksmiths' shop complex: old engine house (3.1), main block (3.2), yard (3.3)
- 4 Old shaft [George's Shaft]: shaft (4.1), winding gear (4.2), cage (4.3), second shaft (4.4)
- 5 Old shaft engine area [New winding engine house]: engine house (5.1), boiler house (5.2), pond (5.3)
- 6 Miners' Dry: two storey building (6.1), single storey building (6.2)
- 7 Day level: adit D (7.1), tramway to crusher (7.2), tramway to platform (7.3)
- 8 Crusher house complex: building on stilts (8.1), crusher house (8.2), platform (8.3), engine house (8.4), chimney (8.5), south buildings (8.6), east building (8.7), open area (8.8), west building (8.9)
- 9 Carpenter's yard: saw pit (9.1), west perimeter wall (9.2), east perimeter wall (9.3), south building (9.4)
- 10 Compressor house area: compressor house (10.1), area to west (10.2), chimney (10.3), flue inspection tunnel (10.4), boiler house (10.5)
- 34 Manager's office complex: main block (34.1), chimney (34.2), south room (34.3), open area (34.4), north area (34.5), steps (34.6)
- 35 Mine count house [private residential]
- 40 Mineral dressing floors: east floor (40.1), west floor (40.2)
- 41 SDR bridge
- 46 Site office and weighbridge
- 47 Retaining wall: stone structure (47.1), walkway [grizzley] (47.2), retaining wall (47.3)
- 48 Platform – iron fixtures (48.1), retaining wall (48.2)
- 55 Coal bunkers

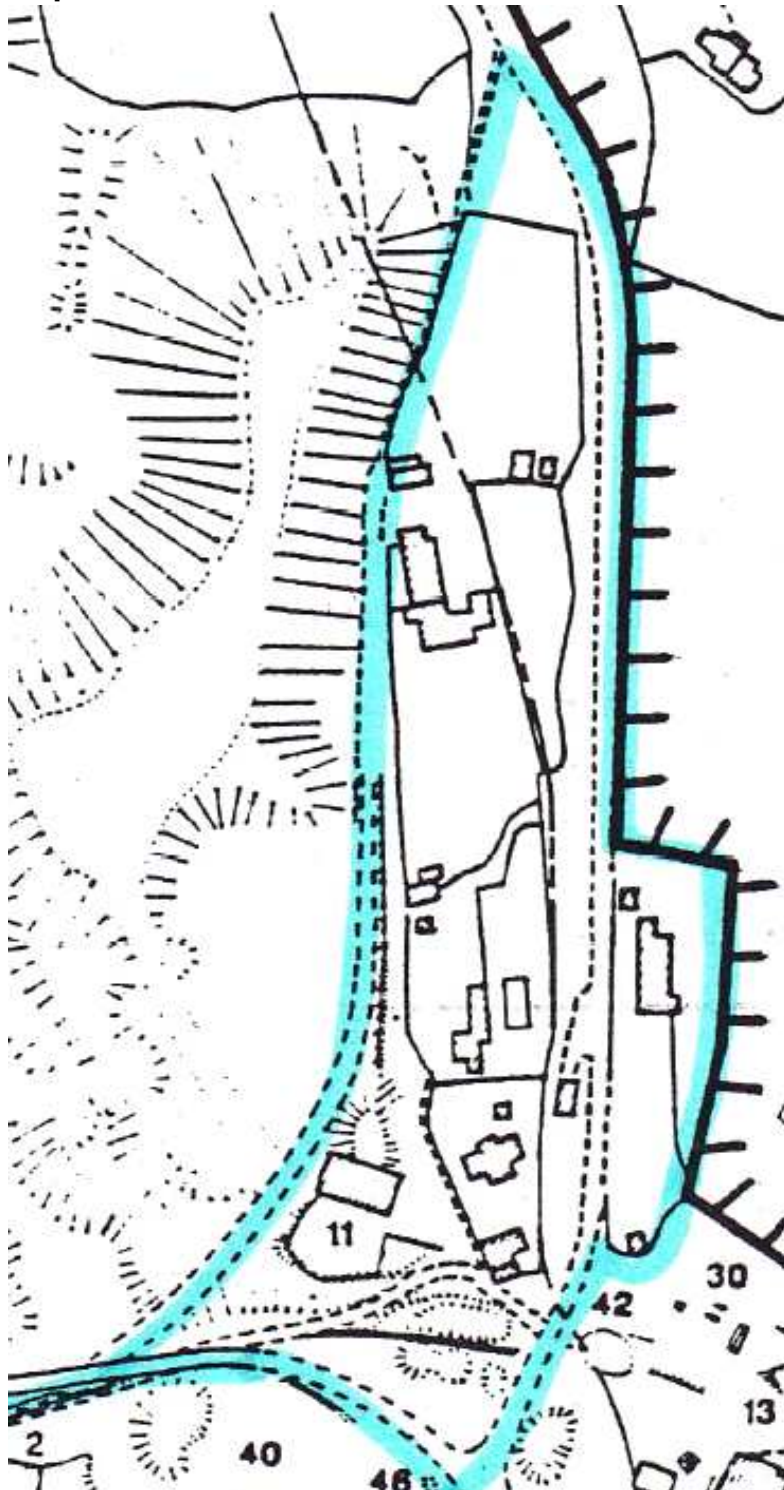
Map 9c: Resting Hill



KEY

- 17 Winding engine shaft complex : engine house (17.1), boiler house (17.2), flue (17.3)
- 18 Pumping engine shaft complex: Cornish engine house (18.1), buildings to north (18.2), tunnel (18.3), chimney (18.4)
- 19 Engine shaft area : engine shaft (19.1), balance bob housing (19.2)
- 20 Resting Hill chimney
- 31 Smelter flue features – smelter flue (31.1.), structure near engine shaft (31.2)
- 36.2 Inclined railway
- 54 Engine shaft spoil

Map 9d: Ore House



KEY

- 11 Ore house complex: ore house (11.1), yard (11.2), tramway to smelter (11.3)

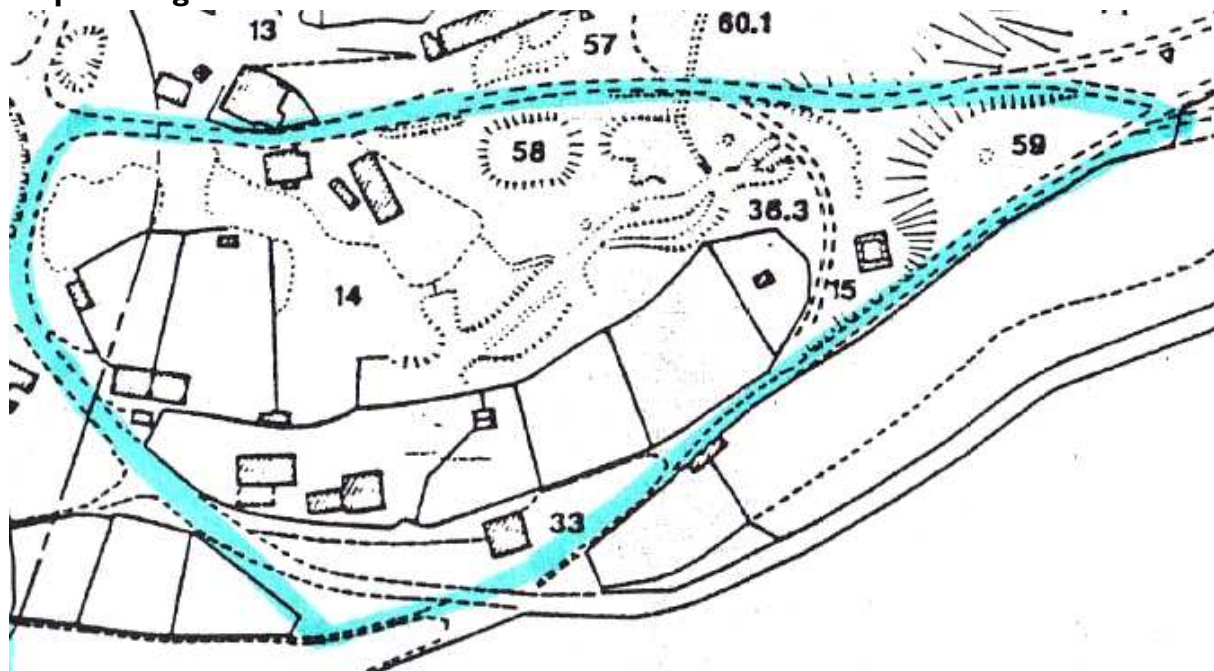
Map 9e: Black Tom



KEY

- 13 Black Tom shaft complex: Black Tom shaft (13.1), engine house (13.3), horse gin (13.4), ladder way (13.5)
- 30 Black Tom ore dressing plant
- 42 Black Tom condensing house : condensing house (42.1), domestic building (42.2), round house (42.3)

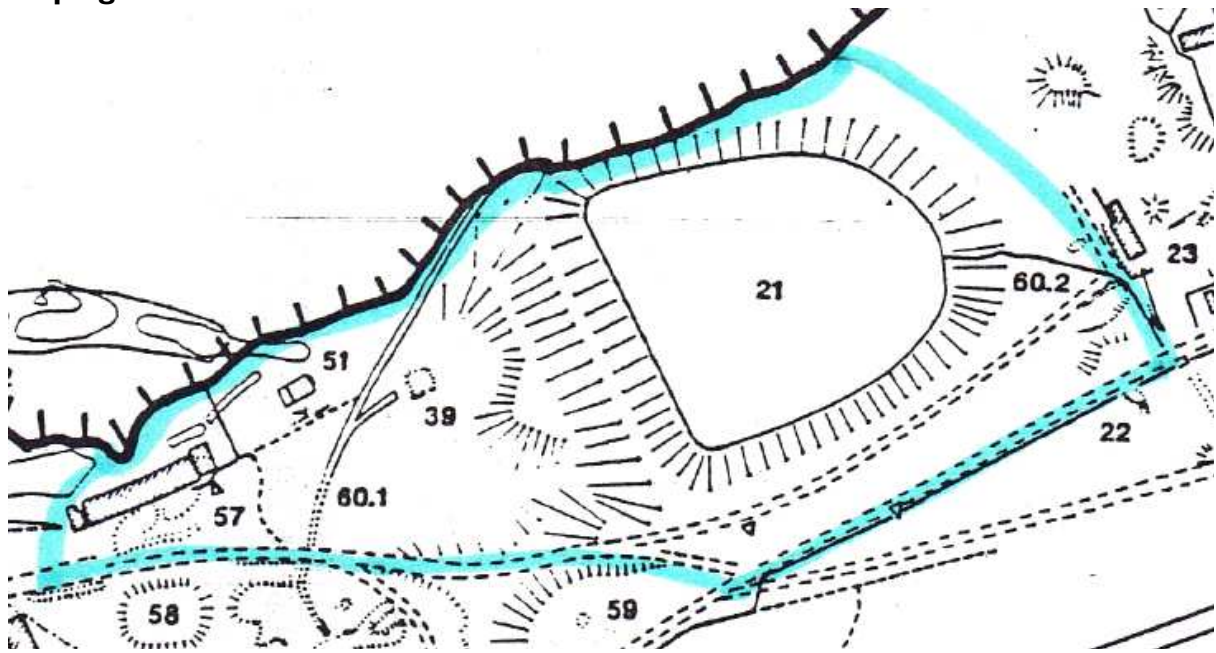
Map 9f: Magazine



KEY

- 14 Old reservoir
- 15 Magazine
- 33 Candlehouse
- 36.3 SDR reversing loop
- 58 Spoil
- 59 Spoil

Map 9g: Reservoir



KEY

- 21 Reservoir
- 39 Reservoir valve house
- 51 Building near valve house [Miner's cottage]
- 57 Black Tom adit] and tramway
- 60.1 Leat below reservoir
- 60.2 Leat above reservoir

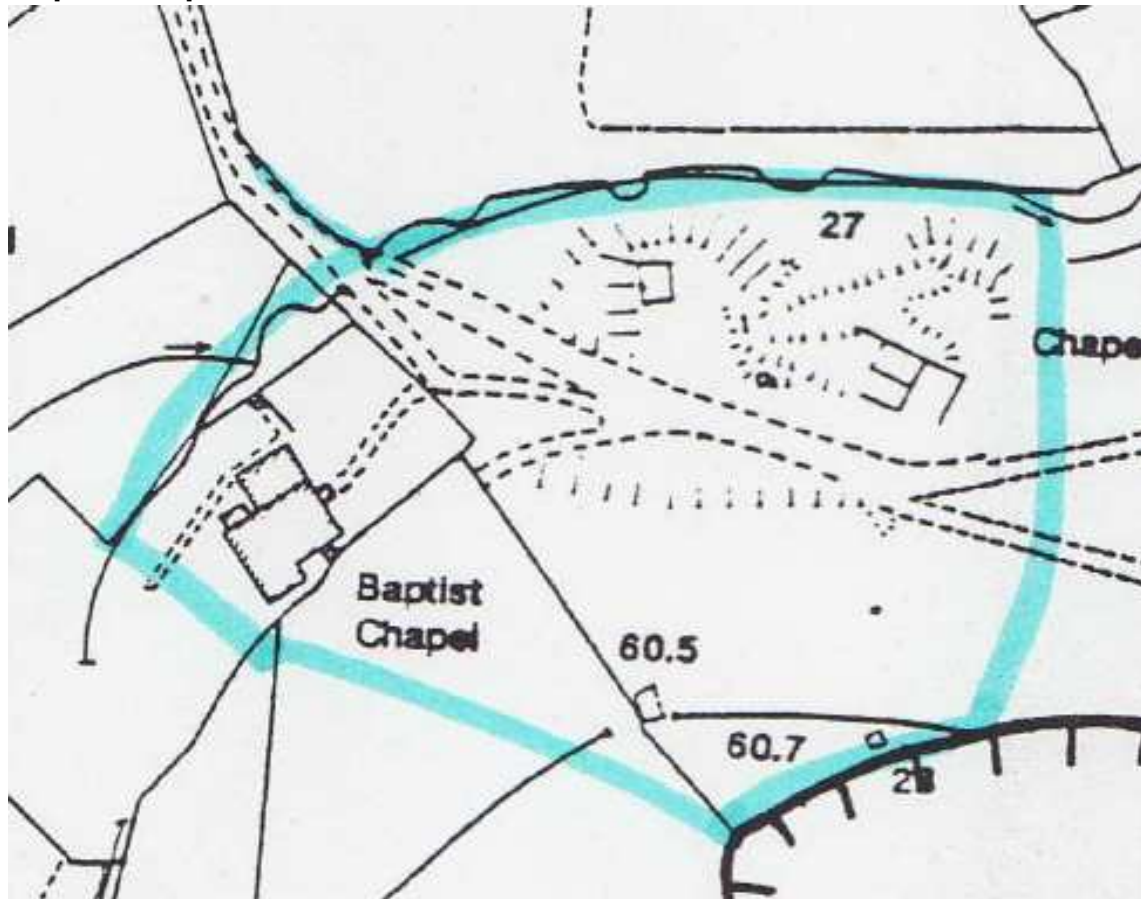
Map 9h: Perkins level & Upper Works



KEY

- 23 Perkins level ore dressing plant
- 24 Perkins level: adit (24.1), building (24.2), tramway and trestle (24.3), screen (24.4), spoil (24.5-6)
- 60.2 Leat above reservoir
- 63 Adit P

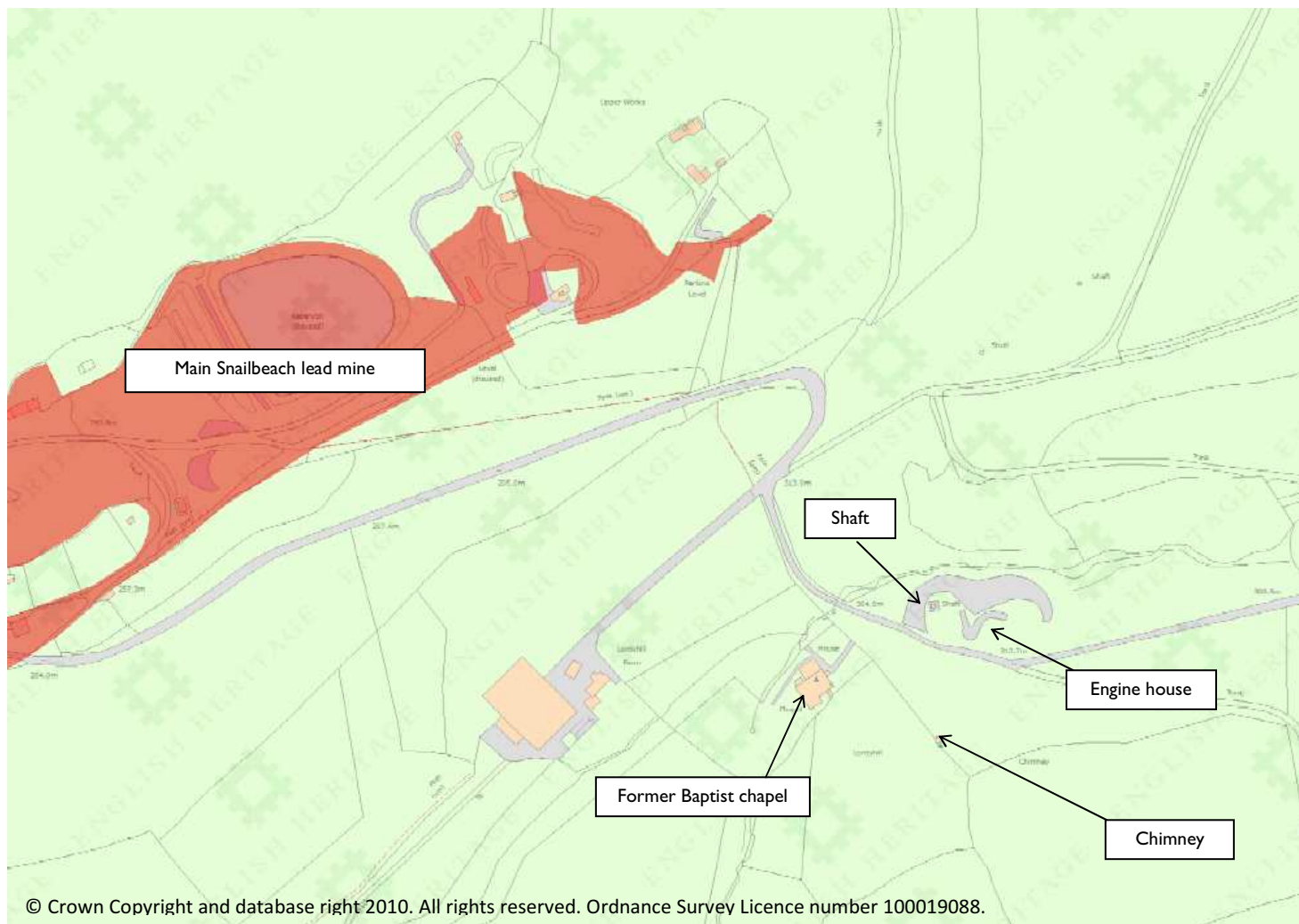
Map 9i: Chapel Shaft



KEY

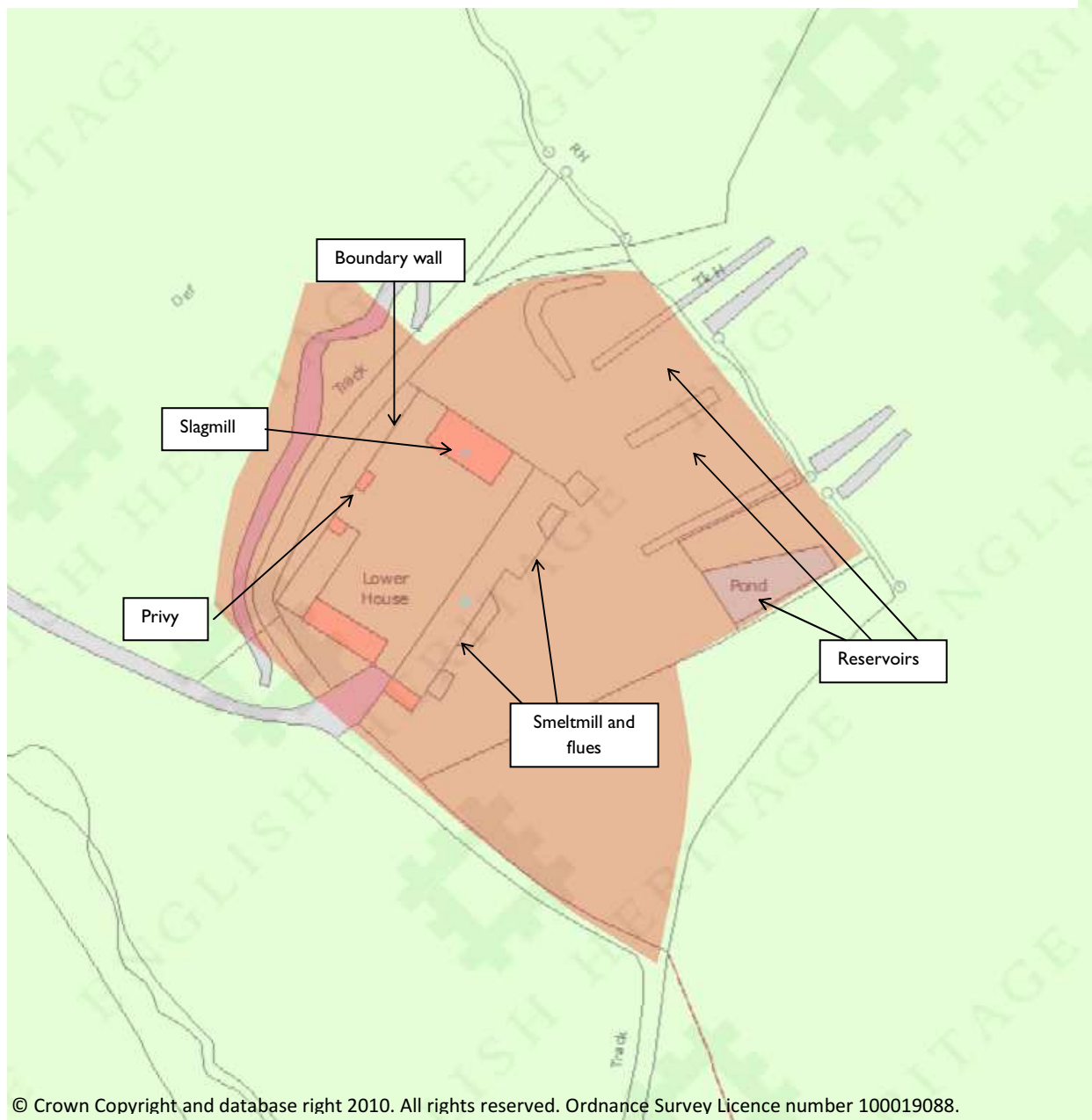
- 27 Chapel Shaft area: Chapel Shaft (27.1), spoil (27.2), engine/boiler house (27.3), flue (27.4), building (27.5)
- 28 Chapel Shaft chimney
- 60.5 Leat, water tank
- 60.7 Leat, at chapel

Map 10b: Chapel Shaft principal features



NOTE Map 10a: Snailbeach Lead Mine principal features is included as a separate document

Map10c: Snailbeach New Smeltnill Principal features



APPENDIX 2: DESIGNATIONS

Scheduled Ancient Monuments

Name: Snailbeach lead mine

List entry Number: 1014866

Date first scheduled: 20-Mar-1997

Legacy UID: 21658

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.

Snailbeach mine ranks as one of the best surviving examples of a lead mining complex. It retains a remarkable concentration of ruined structures which preserve evidence for an evolving sequence of mining techniques from the late 18th century through to the 20th century and, together with earthworks and buried remains, illustrates the whole surface history of the industry during that period. Many of the structures survive particularly well and form a large group illustrating the mine's general layout during its period of peak production in the 19th century. Ore processing works are less well represented nationally, but archaeological surveys and documentary evidence have indicated that buried remains will survive here, particularly beneath White Tip, and the survival of extensive spoil tips is itself unusual. The Snailbeach complex has been recognised as being the best preserved of the Shropshire lead mining sites. Distinct regional variations in mining practice were recognisable

until the beginning of the 19th century, and the early remains at Snailbeach, such as the 18th century winding engine house at Old Engine Shaft and the early exploratory shafts and their associated structures, are therefore particularly valuable examples. There is a considerable archive of documentary material relating to the history of lead mining at Snailbeach, including information on site ownership, management, output and employment and this, too, enhances the value of the site. The mine serves as an important educational resource and many of the surface remains are now accessible to the general public.

Details

The monument is situated within the village of Snailbeach on a west facing scarp slope at the northernmost limit of the Stiperstones ridge. It includes intact buildings and ruins (a number of which are Listed Buildings), earthworks and other remains of parts of Snailbeach lead mine. It also includes parts of an extensive water management system and parts of the associated tramway and railway networks. Although lead mining in the Snailbeach area is believed to have occurred during the Roman period, the first clear references to mining at Snailbeach take the form of leases to Derbyshire miners in 1676 and 1686, whilst systematic working of the main lead vein was begun by Thomas Powys and partners in the 1760s. In 1783 the Snailbeach Mining Company was formed and it operated the mine continuously through the next century. Most surface remains at the site date from the mid or late 19th century when a long programme of major refitting was undertaken. Snailbeach was a rich mine with a large output of lead ore, and throughout the latter half of the 19th century it was one of the top national producers. As the output of lead declined towards the end of the 19th century, the extraction of barytes (used in paint manufacturing) became an important secondary activity and completely eclipsed lead production after 1910, becoming the main ore extracted at the site. Large quantities of barytes were produced not only from underground mining, but also from reworking old spoil tips and, in 1900, the Halvans Company was formed specifically for this operation. During the 20th century the level of operations gradually declined and underground working ceased completely in 1955, although some reworking of spoil for spar (quartz and calcite chips) was still undertaken in the 1970s and 1980s. Snailbeach mine is spread over an area of half a square kilometre. The main ore processing areas and spoil heaps are situated along the foot of the scarp slope, at the mouth of a small valley within which the actual mines and their associated surface remains, including shafts, chimneys and engine houses, are located. There are a large number of old shafts and adits, some of which formed the centre of mining operations, whilst many were used for exploration or were unsuccessful ventures to extract the lead ore. There were four main shafts: Old Engine (also known as George's Shaft), Black Tom, Engine and Chapel. The latter, together with several adits and collapsed stopes further to the north east, all of which are some distance to the south east of the core of the mining operations, are not included in the scheduling. An estate map of 1766, the earliest cartographic record of the Snailbeach landscape, indicates that a number of shafts had been sunk by this date in the western part of the site (in the vicinity of Old Engine Shaft), and on a north-south alignment beneath the present White Tip. The latter are believed to be a series of exploration shafts used to locate the main vein and, although now overlaid by White Tip, they, together with any associated structures, will survive as buried features. By 1797 mining had reached a depth of approximately 80m and the company was employing a Boulton and Watt engine to pump the workings dry, probably through Old Engine Shaft. A number of structures associated with this shaft remain standing, including the ruins of a late 18th century building situated to the west of the shaft. It is thought to be the earliest standing structure at Snailbeach and is important for understanding the early development of this part of the site. The building is square in plan and has a thickened east wall, suggesting that it originally functioned as an engine house with the east wall acting as a pivot point for the beam of a pumping engine serving Old Engine Shaft. By the mid 19th-century this building formed part of a blacksmith's shop complex, the main block of which retains many internal fixtures and fittings, including bellows, a water tank, tools and workboxes. The blacksmith's shop is Listed Grade II and is included in the scheduling. Other structures grouped around Old Engine Shaft include a winding engine house, erected in 1872 when the shaft was deepened, the miner changing house or barracks, built in the 1870s, and an early 20th century boiler house. The stone-built engine house is a Grade II Listed Building and is included in the scheduling. It

originally contained a horizontal steam winder and is believed to have replaced the earlier engine house when the shaft was deepened in the 1870s. To the west of this structure are the earthwork remains of a small pond which was excavated in the late 18th or early 19th century to provide a water supply to the boilers. Approximately 120m to the south of Old Engine Shaft, on the upper slopes of Resting Hill, is a second shaft, known as Engine Shaft, and its associated surface remains which constitute a set of well preserved mine components and are included in the scheduling. Engine Shaft is believed to have been sunk in the 1790s and was used for pumping water out of the mine and for winding. To the east of the shaft are the remains of a mid-19th century winding engine house (a Grade II Listed Building) and its boiler house, and to the west are the ruins of the three-storey pumping engine house. This building was erected in 1858 and housed a 61' Cornish engine which replaced an existing flatrod system of drainage. It is also Listed Grade II and is included in the scheduling. Approximately 1km to the north west of Snailbeach mine are the ruins and earthwork remains of the earlier flatrod drainage system, replaced by Engine Shaft, which are situated at the head of Wagbeach Adit. It operated between c.1795 and 1858 and is the subject of a separate scheduling. The lead ore was not raised to the surface via Engine Shaft, but was removed from the underground workings by a tramway along the Day Level, an adit which connects Engine Shaft with the ore processing area and dressing floors on the valley floor. The portal for this adit is dated 1848 and is visible at the base of the hill, immediately to the east of the miners' barracks. Following the construction of the Snailbeach District Railway in 1877, an inclined plane was built between Engine Shaft and the new rail system on the valley floor. The upper half of the incline survives as a raised linear earthwork, but its lower section has been cut away for new housing in the last decade. An 1872 map of the site indicates that, prior to the construction of the incline the carefully constructed track which currently provides access to Engine Shaft and its buildings was the principal means of access to this area, and this was used again following the abandonment of the incline. Black Tom Shaft is situated approximately 160m north east of Old Engine Shaft. Mine working was being undertaken in this area prior to 1820, and the original Black Tom Shaft is thought to be the same as a shaft shown in this vicinity on the 1766 estate map. Thereafter the area is believed to have remained a centre of mining activity, and during the late 19th and early 20th centuries barytes mining and treatment was concentrated here. Map evidence indicates that a horse-gin for winding was employed at Black Tom during the mid-19th century and, although there are no surface remains of the gin, it will survive as a buried feature to the south of the shaft. The extant winding engine house is thought to date from the use of Black Tom, from 1900, for mining barytes. It is of timber construction and is included in the scheduling. Surface features associated with the treatment of the barytes are visible to the north west of Black Tom Shaft where an ore dressing plant was located from c.1900. This area is defined by low earthworks which seem to form a grid pattern, and includes concrete plinths and a jig and spiral classifier which are included in the scheduling. To the east of Black Tom Shaft is an adit which dates from pre- 1900 and includes a stone-lined tunnel vault running back into a collapsed stope. The line of a tramway leading out of the adit towards Black Tom Shaft is traceable on the ground and rails are in situ within the tunnel and included in the scheduling. In 1863 the mine's old smelt mill at Pontesford was abandoned in favour of a new reverberatory mill completed the previous year. This new mill is located some 0.8km to the north west of the mine and is the subject of a separate scheduling. The two were connected by a tramway which transported the dressed ore from the ore house situated immediately to the south east of White Tip, to the smelter. The ore house is a rectangular, stone building which is thought to have been erected between 1864 and 1869 when the dressing floors within the core area of the mine were remodelled, and the dressed ore was stored here prior to its being transported to the smelt mill. It is a Grade II Listed building which is now in use as a Baptist church and therefore not included in the scheduling, but the ground beneath is included. The new smelt mill to the north west had a partly buried flue, approximately 1km in length, which ran across the mine site up to Resting Hill where the fumes, together with the smoke from the Engine Shaft boilers, were discharged via a chimney. The present chimney, which is Listed Grade II and included in the scheduling, was erected in 1885 following the collapse of the original chimney. The flue ran for part of its length in a trench below ground level but it remains visible between the chimney and the track leading to Engine Shaft. It can also be traced intermittently in the northern part of the site, close to Black Tom Shaft, and where it crosses White

Tip it is thought to survive as a buried feature. Maps of the mine from 1864 to 1901 show a group of four buildings to the south west of Black Tom Shaft which are believed to date from the construction of the smelter flue in c.1862. On the 1872 map the most northerly building is marked as the 'condensing house' and lies on the line of the flue. Although there is no surface evidence for these buildings they will survive as buried features. The core area of the mine, to the north and east of Old Engine Shaft, retains the highest density of standing and buried remains of Snailbeach mine and from the late 18th century onwards it served as the main ore processing area. On emerging at the surface the ore was tipped down chutes leading to the dressing floors where it was crushed and separated. The crusher house complex is situated 35m to the east of Old Engine Shaft. Although the bulk of this complex is thought to date from between 1847 and 1864, the foundations of earlier buildings which are marked on the maps in this location are believed to survive as buried features. The crusher house is a square structure with walls standing up to 2m high. The crushing engine is believed to have been reconstructed in 1873 and, in 1876, was connected to new jiggers to save on labour costs. The north wall of the associated engine house incorporates a circular opening for the drive to the crusher house and a circular recess for a flywheel. The crusher house itself is Listed Grade II and, together with the rest of this complex, is included in the scheduling. To the south west are the ruins of a late 19th century compressor house, and its boiler house and chimney. It originally contained two Siemens and Edwards compressors which provided compressed air for rock drills and winches underground. The compressor house and its adjacent chimney are Listed Grade II and, together with the ruins of its boiler house, are included in the scheduling. After the ore had been crushed it was then taken to the dressing floors to be separated by means of an assortment of buddles and jiggers. The mineral dressing floors situated to the north of the crushing house complex underwent several periods of remodelling during their use. The dressing floors at the southern edge of White Tip are marked on the 1838 tithe map at which time they included two buildings and a semi-circular yard area. Parts of the mine are believed to have been reorganised in 1848, at the time of the construction of the Day Level, and after this date the dressing area was considerably larger, extending south beyond the present approach road to the mine. The floor was again remodelled in the 1870s and maps after this date show a rectangular enclosure incorporating several buildings, a length of tramway, two circular buddles and a waterwheel in this area. The ruins which remain visible at the southern edge of White Tip are thought to date from the late 19th century and the remains of earlier structures will survive as buried features. A second dressing floor, dating from the mid-19th century, is situated between the road and the crusher house. Map and photographic evidence indicates that it also underwent a number of alterations between 1864 and 1901. With the exception of traces of timberwork, there is little surface evidence for the dressing floor itself, but buried features, including circular buddles which are shown on early maps, will survive here. At the end of the dressing processes, the ore was taken by tram via a tunnel beneath the road to the ore house for storage. Sections of the tram rails remain in situ on the northern edge of this dressing floor and are included in the scheduling. The core area retains the ruins, earthworks and buried remains of further significant features associated with operation of the mine. These include the ruins of the manager's office and the locomotive shed (a Grade II Listed Building), and the foundations of the site office, the weighbridge and buildings associated with the carpenter's yard located to the north east of the crusher house. The locomotive shed was built in c.1877 as part of the Snailbeach District Railway to accommodate two locomotives. Map evidence indicates that it stands within an area previously occupied by two buildings, each with a semi-circular yard area, which have been described as dressing floors. The remains of these structures will survive as buried features and provide evidence of early 19th century ore dressing at the site. To the south east of the mine's core area is the substantially intact candle house, together with the plot in which it is set and its approach roads. The powder magazine is located to the north east of the candle house (a Grade II Listed Building); it has a double skin of walling and was constructed in 1863. These structures are included in the scheduling. In 1872 a reservoir was constructed to the east of the core area as a solution to the mine's water shortage problems. The 1864 map of the site shows a large spoil heap in this area which is thought to have been used to construct the reservoir dam. The dam was originally fed from a stream to the south east of Snailbeach by means of a leat. The route of this leat, consisting of open channels and pipes along different parts of its length, can still be traced. A 60m length of the leat,

where it enters the reservoir, is included in the scheduling in order to preserve the relationship between the two features. The reservoir valve house is located immediately to the west of the dam and is a low, earth-covered structure of brick and stone. Internally, it retains a section of the main scour pipe and the valve and is included in the scheduling. The overflow channel for the reservoir runs from the north western end of the dam to join a second channel leading from the valve house. This combined channel runs beneath the track that leads to the eastern part of the mine, and then curves westwards and connects with a pond. This small reservoir is marked on the 1766 map of the site and is thought to have originally supplied water for the dressing floors and the boilers. It is believed to be the earliest visible feature on the site and lies to the east of the carpenters' yard. Further up the valley, to the south east of the reservoir, is a short adit, Perkin's Level, which dates from c.1820. It was an important access point into the eastern part of the mine and gave access to a subsidiary vein from which barytes was excavated by the late 19th century. To the north of Perkin's Level is an area of earthworks, including a platform and an embankment of earth and stone, and spoil heaps which are associated with the working of Perkin's Level. A second adit, marked as an 'Old Level' on the 1901 Ordnance Survey map, is situated approximately 40m to the north east and is also included in the scheduling. The area between the 1872 reservoir and Perkin's Level is the site of a mid-20th century ore processing plant which was erected to separate calcite from the barytes and is included in the scheduling. The plant consists of a collapsed timber-built shed, with a corrugated iron roof, and was powered by a steam engine driving the shaft through pulleys, one of which still remains. A short length of tramway extends north from the shed, and a second length runs east. Close to the shed are the remains of several kibbles, a jaw crusher, iron piping and a heap of barytes. The waste material both from the processing plants and the underground workings was transported by tram to the spoil heaps which now form a distinctive feature of the western approach to the site. From at least 1872 a tramway ran from the Day Level to the spoil heap situated to the west of Old Engine Shaft and sections of the tramway bed remain visible. The construction of the branch line from the Snailbeach District Railway into the mine in 1877 involved making a cutting through this spoil and a bridge (which is also included in the scheduling) was erected over the cutting in order to retain the tramway. A further tramway ran between the dressing floors and White Tip and is believed to survive as a buried feature. White Tip holds a considerable volume of waste material from the mine and from the processing works. Most of the area it now covers was established between 1838 and 1864. From 1911 a Halvans (the Cornish term for waste material) Company was formed to work the waste heaps and to extract barytes from the upper levels of the mine mainly via Black Tom Shaft. At the south western edge of White Tip are the ruins of the company's engine house. It was erected in c.1900 and housed a steam engine used to drive the tip-reprocessing plant. The interior of the building retains the foundations for the cylinder together with the flywheel pit and is included in the scheduling. Map evidence indicates that several generations of spar (quartz and calcite chips) processing plant were sited on White Tip and these will survive as buried features. The ore house (a Grade II Listed Building), number 19 and number 8 Snailbeach and their associated outbuildings which occupy the area around Black Tom Shaft and the early reservoir, the farm buildings to the east of this shaft, the road bridge across the former Snailbeach District Railway to the west of White Tip, the electricity and telegraph poles, fence posts, sign posts, modern walling and the surfaces of all roads and pathways are excluded from the scheduling, but the ground beneath all these features is included.

Name: Snailbeach new smeltnill, 350m north east of Green Acres

List entry Number: 1017764

Date first scheduled: 23-Feb-1998

Legacy UID: 21661

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. The reverberatory lead smelt mill was developed in the late 17th century, and marked an important stage in the development of the switch from wood to coal fuel which rendered the Industrial Revolution possible. The reverberatory smelt mill was a rectangular enclosed structure of stone or firebrick held by iron strapping, within which ore was smelted by the heat of flames from a separate coal fire in one end, reflected down onto the ore by an arched roof. The separation of fuel from ore made the use of coal possible. A chimney (or flue to a separate chimney) at the far end from the fire provided the draught to draw the flames over the ore; no air blast was used and, consequently, water power was not required. Early reverberatory lead smelt mills consisted simply of a large barn-like building containing the furnaces, with chimneys projecting from the outer wall. Late 18th and 19th century smelt mills were often large complexes containing several smelting furnaces, together with slag hearths for extracting lead from the slags, roasting furnaces for preparing the ore, refining furnaces for extracting silver from the lead by a process known as cupellation, and reducing furnaces for recovering lead from the residue or litharge produced by cupellation, together with sometimes complex systems of flues, condensers and chimneys for recovering lead from the fumes given off by the various hearths and furnaces. Reverberatory smelt mill sites will also contain fuel stores and other ancillary buildings. Many of the later sites used water power to provide the air blast for the slag hearths. Reverberatory smelt mills existed in all the lead mining fields of England, and also in some coastal areas, using imported ores; about 100 sites are believed to have existed. Since both the buildings and the sites of reverberatory smelt mills were more easily reused than those of ore hearth smelt mills, examples surviving as well preserved field monuments are very rare nationally. All early sites with any structural or earthwork remains, and all later sites retaining a range of structural and/or earthwork features, together with any sites believed to retain the remains of furnaces, whether as exposed ruins or as buried stratigraphy, will merit protection.

The Snailbeach new smeltnill survives well and is considered one of the best preserved examples of its type in the country. The remains are unusually complete for a monument of this type and date and, with the exception of the hearth itself, much of the internal arrangement of the slag mill is visible, whilst buried archaeological deposits within the floor of the furnace structure will provide information on the layout and mode of operation of the furnaces. In addition, the slag tips form an important source of information for the scientific study of reverberatory smelting and the importance of the site is increased by its short working life, with little subsequent disturbance.

Details

The monument is situated 350m north east of Green Acres and includes the standing remains (several of which are Listed Grade II) and buried features of Snailbeach new smeltnill and the earthworks of associated reservoirs and a transport system.

The smeltnill was constructed in 1862 for the Snailbeach Mining Company, whose lead mine was located some 0.8km to the south. The mine's former smeltnill at Pontesford was abandoned in 1863 in favour of this new reverberatory mill; it possessed totally enclosed furnaces which were able to operate continuously; and was connected to the mine by railway. A decline in the demand for lead in the late 19th century resulted in the closure and demolition of much of the site in 1895, although one hearth was operated for a short period in June 1897.

Much of the layout of the smeltnill complex survives intact and, together with map evidence from the late 19th century, allows the plan of the site to be reconstructed. The buildings are situated within a rectangular enclosure, bounded by rubblestone walls along its south, west and north west sides. The smeltnill building itself defines the east side of this enclosure and is a rectangular structure of roughly coursed stone which has been constructed against a slope on a levelled terrace. It is believed to have originally housed at least four reverberatory furnaces, a roasting hearth and, at

the northern end of the building, a vaulted chamber which may have been used for storage. The furnaces were located against the rear wall of the building and were charged from above, access being provided via a railway track which ran parallel with the east side of the building. The furnaces themselves have been removed but their buried remains and those of associated features will survive.

Five flues which are Listed Grade II and included in the scheduling, are visible exiting the rear of the mill structure from which they run independently to an underground condensing chamber where further quantities of lead would have been recovered from the fumes. This is located approximately 50m south east of the smeltnill structure, and although it has collapsed and been partly infilled, its buried remains will provide information for its design and plan. From here, a single flue ran southwards as far as Lordshill at Snailbeach mine where the fumes were discharged via a chimney. Parts of the flue have collapsed but, those sections which survive intact within the mine site are the subject of a separate scheduling.

Although the reverberatory furnace was effective in removing lead from the ore, the slag was still fairly rich in metal and, during the 19th century, it was invariably resmelted in a slagmill. The slagmill at Snailbeach, a Grade II Listed Building which is included in the scheduling, is situated at the northern end of the enclosure and is now used for storage. It is built of roughly coursed rubblestone with brick dressings. The interior is divided into two rooms by two parallel cross walls and the floor of the western room is considerably lower than that to the east. The hearth which was set within these cross walls has been removed but much of the internal arrangement remains visible. The basic slaghearth was of fairly simple construction with the tapping opening located at the front base of the hearth whilst the charging door was positioned above the hearth bottom, reached via the higher level at the rear. The brick flue from the slagmill is visible beyond the northern end of the smeltnill building, running south as far as the condenser.

Whereas the reverberatory furnace relied on a chimney to provide a draught, slagmills required a blast, and at Snailbeach this is believed to have been provided by steam powered fans which were probably located in the eastern half of the building. To the north east of the slagmill are four small reservoirs which have been terraced into the hillslope; they are now mostly dry but would have provided the water supply for a steam engine. Immediately to the north and north west of the slagmill are several slag tips; these in situ deposits of process residues will retain important technological information about lead smelting in the late 19th century and are thus included in the scheduling. The site was served by a network of railway tracks which transported material from one process to another, and was connected to the Snailbeach District Railway via two branch lines that approached from the north east. Buried remains of the track beds are believed to survive beneath the ground surface and these are included in the scheduling.

The south side of the enclosure is occupied by the dwelling known as the Smelthouse, part of which is believed to have formerly served as the site office. Much of the southern boundary wall to the complex has been incorporated within its fabric and this, together with the house itself, is thus excluded from the scheduling but the ground below is included. All fence posts and the dwelling's associated outbuildings are also excluded, although the ground beneath these features is included.

Listed buildings

WORTHEN C.P. SNAILBEACH LEAD SJ 30 SE MINE SJ 3744 0219

6/152 Locomotive shed - at N.G.R. SJ 3744 0219

GV II

Locomotive shed. C.1877. Regularly coursed limestone rubble with red brick dressings and wooden lintels to window openings; double-span gable front roof, with one plane retaining original diagonal wooden boarding. Single storey; 2 louvred wooden air vents in roof slope to front and double wooden doors. Interior: 2 narrow gauge tracks with inspection pits below and metal air ducts above suspended from roof. The Snailbeach District Railway opened in 1877 and was used to bring coal to the mine and to transport lead and barytes away from it. F. Brook and M. Allbutt, *The Shropshire Lead Mines* (1973) p.69 and plate 19.

Listing NGR: SJ3744302195

List entry number: 1055011 UID: 257483 Date listed: 14-Nov-1986

WORTHEN C.P. SNAILBEACH LEAD SJ 30 SE MINE SJ 3743 0216

6/153 Blacksmith's shop - and associated outbuilding attached to south at N.G.R. SJ 3743 0216

GV II

Blacksmith's shop and associated stone outbuilding. Mid-C19. Blacksmith's shop: red brick with roughly coursed limestone rubble to gable ends; corrugated iron roof with red brick stack in roof slope to east side. One storey; entrance through double doors to far left of east side. Interior: much of equipment survives and floor littered with blacksmith's debris and a few tools at time of resurvey (October 1985): principal fittings are a lifting device in the form of a gallows and a brick furnace with hand-operated bellows still in situ. Outbuilding attached to south: uncoursed limestone rubble with red brick dressings, now roofless; square plan with blocked doorway on south side.

Listing NGR: SJ3742602166

List entry number: 1176609 UID: Date listed: 14-Nov-1986

WORTHEN C.P. SNAILBEACH LEAD SJ 30 SE MINE SJ 3742 0215 6/154

Winding engine house - at N.G.R. SJ 3742 0215

GV II

Winding engine house. Late C19. Regularly coursed limestone rubble with engineering and red brick dressings; now roofless. Rectangular plan. 2 levels; flat-headed window openings with stone and wooden lintels on long sides. External staircase with cast-iron handrail leading to blocked doorway survives to north-east gable end. Probably constructed during 1870s as part of extensive improvements to the mine. F. Brook and M. Allbutt, *The Shropshire Lead Mines* (1973) p.67.

Listing NGR: SJ3742402145

List entry number: 1367007 UID: 257485 Date listed: 14-Nov-1986

WORTHEN C.P. SNAILBEACH LEAD SJ 30 SE MINE SJ 3746 0213

6/155 Compressor House - and attached chimney at N.G.R. SJ 3746 0213

GV II

Compressor house and attached chimney. Dated 1881 (datestone to front gable and in yellow brick to chimney). Regularly coursed limestone rubble with red brick dressings; gable front roof with cladding (slates) removed but retaining purlins and rafters, fretted bargeboards. Rectangular plan. 2 levels; 2 round-arched windows to front gable on first floor and blocked doorway with stone lintel to centre on ground floor; external staircase to right side (far end) has cast-iron balustrade to top

and leads to blocked doorway with stone lintel. Chimney: attached to left side, engineering brick on rubble base; square section tapering to top which has toothed capping. Interior: first floor removed but stone supports for compressor remain; king-post roof in 5 bays. The compressor house originally contained 2 Siemens and Edwards compressors which provided compressed air for rock drills and winches underground. F. Brook and M. Allbutt, *The Shropshire Lead Mines* (1973) p.67.
Listing NGR: SJ3747302135

List entry number: 1055012 UID: 257486 Date listed: 14-Nov-1986

WORTHEN CP SNAILBEACH LEAD SJ 30 SE MINE SJ 3750 0215

6/157 Crusher House at - NGR SJ 3750 0215

GV II

Crusher house. C1873. Regularly coursed limestone rubble with red brick dressings to windows, now roofless. Rectangular plan. 2 storeys with circular opening on north side. Associated chimney has stone base and yellow and red brick above. The crushing engine (formerly housed in the building) was reconstructed in 1873 and in 1876, to save manual labour, was linked to the 8 jiggling machines (no longer extant) used in ore dressing. Included for group value. F Book and M Allbutt, *The Shropshire Lead Mines* (1973) p.67.

Listing NGR: SJ3748402158

List entry number: 1176636 UID: 257487 Date listed: 14-Nov-1986

WORTHEN C.P. SNAILBEACH LEAD SJ 30 SE MINE SJ 3751 0224

6/151 Ore House at NGR - SJ 3751 0224

II

Ore house. Mid- to late C19. Regularly coursed limestone rubble with red brick dressings and patching, slate roof. Single storey; south side has double doors to left and late C20 door to right. Late C19 multi-paned casement to right gable end. Interior: central brick wall; left side now used for stores, right as religious meeting house. Probably constructed during 1870s as part of extensive improvements to the mine. F. Brook and M. Allbutt, *The Shropshire Lead Mines* (1973) P.67.

Listing NGR: SJ3750402250

List entry number: 1307830 UID: 257482 Date listed: 14-Nov-1986

WORTHEN C.P. SNAILBEACH LEAD SJ 30 SE MINE SJ 3769 0217

6/161 Magazine at N.G.R. - SJ 3769 0217

II

Magazine. Mid-C19. Uncoursed limestone rubble, now roofless. Square plan with double walls. Single storey; one blocked window on east and west sides. The building was used to store explosives and the double-walled construction was intended to contain any explosions caused by their accidental ignition.

Listing NGR: SJ3771002160

List entry number: 1176660 UID: 257491 Date listed: 14-Nov-1986

WORTHEN CP WORTHEN SJ 30 SE

6/164 Former Candlehouse at Snailbeach Lead Mine

II

Former candlehouse. Early C19. Coursed rubble stone with brick dressings and Welsh slate roof. Single storey. Central double door with small single-light window either side. 2 similar windows to left side and to rear. Interior not inspected.

Listing NGR: SJ3763302099

List entry number: 1261135 UID: 257500 Date listed: 26-Jan-1989

WORTHEN CP SNAILBEACH LEAD SJ 30 SE MINE SJ 3743 0205

6/158 Engine house at - NGR SJ 3743 0205

GV II

Engine house. Mid-C19. Roughly coursed limestone rubble with stone angle quoins, graded slate roof. Rectangular plan. 4 levels; west gable end has flat-headed openings with timber lintels to each floor, similar openings on other sides. Remains of boiler house to north and open shaft to east.

Interior: King-post trusses survive to roof.

Listing NGR: SJ3743602045

List entry number: 1366969 UID: 257488 Date listed: 14-Nov-1986

WORTHEN C.P. SNAILBEACH LEAD SJ 30 SE MINE SJ 3746 0206

6/159 Winding engine house - at N.G.R. SJ 3746 0206

GV II

Winding engine house. Mid-C19. Roughly coursed limestone and shale rubble with stone angle quoins, now roofless. Rectangular plan with square projection to south. Walls now stand to a maximum of 5m high. Included for group value.

Listing NGR: SJ3746202048

List entry number: 1176648 UID: 257489 Date listed: 14-Nov-1986

WORTHEN C.P. SNAILBEACH LEAD SJ 30 SE MINE SJ 3744 0197

6/160 Chimney at N.G.R. - SJ 3744 0197

GV II

Chimney. Mid-C19. Reddish brown engineering brick skin to rubble core with roughly coursed limestone plinth and stone capping. Octagonal shaft tapering to top on square plinth; round-headed arches to plinth on north and south. Forms a prominent landmark on the south side of the Snailbeach Valley. The remains of the flue, associated with the chimney, but which has mostly been removed, survive on the hill below the chimney and can be identified by several largely-collapsed round-headed brick arches (not included), which served as access points to its tunnel.

Listing NGR: SJ3742801966

List entry number: 1176648 UID: 257489 Date listed: 14-Nov-1986

WORTHEN C.P. SNAILBEACH LEAD SJ 30 SE MINE, Lordshill SJ 3813 0203

6/162 Chapel Shaft Chimney - at N.G.R. SJ 3813 0203

II

Chimney. C.1860-70. Reddish brown brick on chamfered plinth with stone capping. Square section tapering to top. Associated with Chapel Shaft, sunk in 1859 on land belonging to the Earl of Tankerville. F. Brook and M. Allbutt, *The Shropshire Lead Mines* (1973) p.73.

Listing NGR: SJ3810002039

List entry number: 1366970 UID: 257492 Date listed: 14-Nov-1986

WORTHEN C.P. LORDSHILL SJ 30 SE

6/137 Baptist Chapel and - attached cottage

II

Baptist chapel and attached cottage. Dated 1833, re-built 1873 with later alterations. Stucco with plain tile roof. Chapel: gable front; fixed-light round-headed windows to either side of gabled porch with inner 6-panel double doors and one window above to centre; 2 similar windows to 'ritual' east end. Datestone with inscription 'Erected/AD 1833/Rebuilt/1873' to front with pointed finial above to

gable. Cottage: probably c.1873; one storey and attic, toothed eaves cornice; plate- glass sashes to left and right of central entrance and to gabled half dormers directly above; 4-panel door with bracketed lean-to hood; rendered internal end stack to right. Interior: majority of fittings late C19; benches, wainscot panelling and reader's desk all of this date but 2 cast-iron columns supporting west gallery may be original. Round- arched panel behind desk supported by 2 pairs of consoles has the painted words "Serve the Lord with Gladness"; circular moulded panels to roof. 4-panel door with rectangular overlight in left wall leads to lean- to vestry. The cottage was formerly the manse and the chapel is described in the work of Mary Webb, the Shropshire novelist. Its re-building dates to the period of extensive improvements at the neighbouring Snailbeach Lead Mine.

Listing NGR: SJ3803702072

List entry number: 1055006 UID: 257468 Date listed: 14-Nov-1986

WORTHEN C.P. - SJ 30 SE

6/97 Remains of Lead - Smelting Flues approx. 20m north-east of The Smelt House
GV II

The Smelt House is shown on O.S. map as Lower House. Remains of lead smelting flues. Late C19. Roughly coursed limestone rubble with red brick dressings. Substantial remains of round-headed brick flues and retaining wall. Several of the flues are open and one to front is tunnelled back for some considerable distance below ground. Surrounding well-preserved earthworks, including rectangular- shaped pond to north-east, are all associated with former lead smelting complex (q.v. under Former Lead Smelting Works). The Smelt House is not included in this list.

Listing NGR: SJ3734803021

List entry number: 1055031 UID: 257430 Date listed: 14-Nov-1986

WORTHEN C.P. - SJ 30 SE

6/96 Former Lead Smelting - Works approx. 60m north-east of The Smelt House
GV II

The Smelt House is shown on O.S. map as Lower House. Lead smelting works, now disused. Late-C19. Roughly coursed limestone rubble with red brick dressings; graded slate roof. 2 levels; 2 segmental- headed openings to lower left with tall rectangular opening to left of centre; segmental-headed doorway to centre with similar but mutilated window opening to right; wide entrance to far right heightened by removal of original arch. Gabled wooden louvre to left of centre with red brick ridge stack immediately to right. Left gable end has wide segmental- headed entrance flanked by tall segmental-headed windows. Interior: divided into 2 parts with central passage by full-height brick and rubblestone cross walls. Rubblestone wall has round-headed arches on 2 levels, that to lower level flanked by rectangular openings with wooden lintels; similar round-headed arch to upper level of brick wall. King-post roof and original brick floor to left of rubblestone cross wall. No equipment remains. The Smelt House is not included in this list.

Listing NGR: SJ3734803055

List entry number: 1307989 UID: 257429 Date listed: 14-Nov-1986

SSSI citations

Snailbeach Mine SSSI

COUNTY: SHROPSHIRE SITE

NAME: SNAILBEACH MINE

DISTRICT: SOUTH SHROPSHIRE

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 (as amended).

Local Planning Authority: SHROPSHIRE COUNTY COUNCIL, South Shropshire District Council

National Grid Reference: SJ 374023 Area: 0.85 (ha.)

Ordnance Survey Sheet 1:50,000: 126 1:10,000: SJ 30 SE

Date Notified (Under 1981 Act): 14/11/95 Date of Last Revision: –

Other Information:

New site.

A Geological Conservation Review site.

Description and Reasons for Notification:

A series of lead-barium veins within the Ordovician Mytton Formation have been exploited for lead, possibly since Roman times. Most of the mines are now inaccessible. The once extensive mine dumps on the east side of the Stiperstones-Ploxgreen Road testified to the scale of working in Snailbeach Mine, the largest lead mine in the district. Although most of these mine dumps have been reclaimed, a conservation section retains samples of the coarser grained material from which good specimens of galena, sphalerite, barite and calcite can be obtained. Of particular interest is the presence of witherite. Specimens have recently been obtained in which typical waxy witherite is attached to a heavy carbonate with a rhombohedral cleavage.

Stiperstones and Hollies SSSI

COUNTY: SHROPSHIRE

SITE NAME: THE STIPERSTONES & THE HOLLIES

DISTRICT: SOUTH SHROPSHIRE

SITE REF: 15OHV

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended

Local Planning Authority: SHROPSHIRE COUNTY COUNCIL, South Shropshire District Council

National Grid Reference: SJ 370000 Area: 587.8 (ha.) 1452.5 (ac.)

Ordnance Survey Sheet 1:50,000: 126, 137 1:10,000: SO 39 NE, NW, SO 30 SE

Date Notified (Under 1949 Act): 1953 Date of Last Revision: 1971

Date Notified (Under 1981 Act): 1989 Date of Last Revision: –

Other Information:

Site boundary alteration (extension and deletion).

Part owned and managed as a National Nature Reserve (437 ha.) by the Nature Conservancy Council.

The site lies within the Shropshire Hills Area of Outstanding Natural Beauty.

Description and Reasons for Notification:

The Stiperstones are a series of tors which outcrop along a prominent quartzite ridge to the south west of Shrewsbury. Rising to an altitude of 536 metres, the hill supports an extensive and varied heathland vegetation showing transitions between southern lowland and northern upland heaths. The site is also important for its exposures of Ordovician sedimentary rocks and is of outstanding interest for periglacial geomorphology, in particular tors, stone circles and stone stripes.

Biology

The heathland vegetation varies with altitude and aspect. This is particularly evident in the steep sided valleys on the western side of the hill where bell heather *Erica cinerea* and western gorse *Ulex gallii* are characteristic of south facing slopes, whereas bilberry *Vaccinium myrtillus* is particularly abundant on north facing slopes. On higher ground, cowberry *Vaccinium vitis-idaea* and crowberry *Empetrum nigrum* are significant components of the heathland. Typical heathland herbs include heath bedstraw *Galium saxatile*, tormentil *Potentilla erecta* and common cow-wheat *Melampyrum pratense*. Heather *Calluna vulgaris* is abundant or dominant in all these communities. The tors and boulders of the upper slopes provide important habitat for several species of moss and also support a diverse lichen flora. The siliceous substrate favours species such as *Parmelia multifida*, *P. mougeotti*, *P. incurva* and several species of *Lecidea*. On both sides of the ridge there are areas of grassland most of which are the remains of abandoned small holdings. Some of these have a rich flora which includes heath bedstraw, heath speedwell *Veronica officinalis* and mouse-ear hawkweed *Hieracium pilosella*. In one field, mountain pansy *Viola lutea* is abundant. Formerly common in the south Shropshire hills this species is now scarce. The site includes a series of wet flushes in which mosses such as *Sphagnum* spp., *Polytrichum commune* and *Aulacomnium palustre* form a significant component of the vegetation. Also present are a number of peatland plants including bog asphodel *Narthecium ossifragum*, common cottongrass *Eriophorum angustifolium*, heath spotted orchid *Dactylorhiza maculata* and bog pimpernel *Anagallis tenella* as well as a variety of sedges; in particular common yellow-sedge *Carex demissa*, carnation sedge *C. panicea*, star sedge *C. echinata*, flea sedge *C. pulicaris* and tawny sedge *C. hostiana*. Of particular note is the presence of marsh hawk's-beard *Crepis paludosa*, at its southernmost locality in the county, and the increasingly uncommon marsh St John's wort *Hypericum elodes*. In the western valleys and on parts of Black Rhadley Hill there are areas of birch *Betula* spp. woodland and, at Resting Hill, a sizeable area of sessile oak *Quercus petraea* coppice. Around the edges of the site are patches of gorse *Ulex europaeus* and broom *Cytisus scoparius* scrub. One of the most remarkable features of the site is an area at the northern end of the ridge which is known as The Hollies. This is an area of 'holly parkland' of great antiquity which is considered to be unique for both its size and for the age of the holly *Ilex aquifolium* trees. These trees, which have unusually large girths, are at least 250 years old. However, many of the largest trees are likely to be over 300 years, and some possibly as old as 400 years. As well as being recognized as one of the oldest stands of holly in Europe, the hollies are considered to be amongst the oldest trees of any species in Britain. In the past the holly trees were pollarded to provide winter fodder, and as a result of this type of management they have well developed crutches in which rowans *Sorbus aucuparia* have become established. The oak coppice at Resting Hill supports a population of the upland wood ant *Formica lugubris* which occurs here at the southernmost edge of its distribution in Britain. Along the western edge of the site are a series of derelict mine shafts and adits. Many of these provide important winter roosts for several species of bat. The presence of the uncommon lesser horseshoe bat *Rhinolophus hipposideros* is of particular note. Breeding birds include red grouse *Lagopus lagopus scoticus*, wheatear *Oenanthe oenanthe*, whinchat *Saxicola rubetra*, and in the wooded fringes of the site, redstart *Phoenicurus phoenicurus* and pied flycatcher *Ficedula hypoleuca*.

Geology and Geomorphology

This is a classic geological site providing exposures of Arenig sedimentary rocks formed about 475 million years ago during the early Ordovician Period. The ridge is formed of durable Stiperstones Quartzite whereas the remainder of the site is underlain by Mytton Flags and Tankerville Flags. The flagstones are of particular importance for their fossil fauna. At a number of locations between Mytton Dingle and Snailbeach are exposures of Britain's thickest Arenig sedimentary development. Here a section through the Stiperstones Quartzite, Mytton Flags and Tankerville Flags totals over 1000 metres. The Mytton Flags yield a rich trilobite fauna which includes common species of the shallow water 'Neseuretus community' together with other unique forms which have not yet been found at any other Arenig site. At Bergam Quarry there are exposures of horizons which are high in the sequence of Tankerville Flags. These horizons contain an assemblage of trilobites which is known as a 'raphiophorid community'. These are mid-depth, bottom living and pelagic species which give a late 'hirundo' Zone age for these beds. The fossils from all these sites are of great value in dating the

rock sequence, reconstructing the early Ordovician environment and making comparisons with rocks of the same age elsewhere in Britain and overseas. The Stiperstones ridge is capped by a series of quartzite tors, including The Devil's Chair, which rise to 20 metres. The tors are surrounded by block-fields of angular boulders, and fine examples of large stone circles occur on low angled slopes. The circles become elongated downslope and merge into stone stripes which cover the flanks of the ridge. The tors, circles and stripes provide an excellent assemblage of frost shattered and frost sorted features formed under periglacial conditions probably during the last glaciation when the area lay adjacent to the ice sheet margins.

APPENDIX 3: SPECIES RECORD

The following list is a summary of recorded species extracted from the existing environmental information supplied by Shropshire Council in March 2011; only those sightings within the management strategy area have been included. The Council record is based on records collated by the Shropshire Wildlife Trust, last supplied in July 2010. All biodiversity interest is unlikely to have been surveyed.

European Protected Species				
Name and [no.]	Location and grid ref. (within 100m)	Date	Recorder	
Otter [1] (<i>lutra lutra</i>)	Scott level SJ378021	28/01/2007	Shropshire Bat Group	
Common dormouse [1] (<i>muscardius avellanarius</i>)	Snailbeach Mine SJ375022	09/09/2007	C. Turtle	
Daubenton's bat [1] (<i>myotis daubentoni</i>)	Snailbeach Mine SJ375022	10/01/1985	A. McLeish	
Natterer's bat [2] (<i>myotis nattereri</i>)	Snailbeach Mine SJ372020	12/12/1993	AML	
Natterer's bat [2]	Snailbeach Mine SJ375022	27/02/1993	AML	
Natterer's bat [2]	Snailbeach Mine SJ382023	27/02/1993	AML	
Natterer's bat [2]	Snailbeach Mine SJ375022	18/01/1995	AML	
Natterer's bat [1]	Snailbeach Mine SJ378021	29/01/2006	SBG	
Brown long-eared bat [1] (<i>plecotus auritus</i>)	Scott level SJ378021	28/01/2007	SBG	
Brown long-eared bat [6]	SJ3702	15/09/1979	Unknown	
Lesser horseshoe bat [4] (<i>rhinolophus hipposideros</i>)	Snailbeach Mine SJ375022	10/01/1985	AML	
Lesser horseshoe bat [2]	Snailbeach Mine SJ375022	10/01/1985	AML	
Lesser horseshoe bat [1]	Snailbeach Mine SJ375022	01/1985	M. Packwood	
Lesser horseshoe bat [15]	Snailbeach Mine SJ375022	27/02/1993	AML	
Lesser horseshoe bat [5]	Snailbeach Mine SJ375022	06/03/1993	AML	
Lesser horseshoe bat [1]	Snailbeach Mine SJ378023	12/12/1993	AML	
Lesser horseshoe bat [1]	Snailbeach Mine SJ378023	24/04/1993	AML	
Lesser horseshoe bat [14]	Snailbeach Mine SJ378023	27/02/1993	AML	
Lesser horseshoe bat [10]	Snailbeach Mine SJ375022	18/01/1995	AML	
Lesser horseshoe bat [2]	Snailbeach Mine SJ378021	30/01/2005	J. Morgan	
Lesser horseshoe bat [36]	Perkins Level SJ382023	09/01/2005	JM	
Lesser horseshoe bat [2]	Snailbeach Mine SJ378021	29/01/2006	SBG	
Lesser horseshoe bat [4]	Snailbeach Mine SJ378021	28/01/2007	SBG	
Lesser horseshoe bat [1]	Scott Level SJ378021	28/01/2007	SBG	
Lesser horseshoe bat [45]	Perkins Level SJ382023	27/01/2007	SBG	
UK (UKBAP) and local Biodiversity Action Plan (BAP) species				
Grayling butterfly [12] (<i>hipparchia semele</i>)	Snailbeach Mine SJ375022	1999	J. Joy	UKBAP
Grayling butterfly [14]	Snailbeach Mine SJ375022	05/08/1993	D. Poynton	UKBAP
Wall butterfly [1] (<i>lasioommata megera</i>)	Snailbeach Mine SJ375022	11/08/1999	JJ	UKBAP
Cinnabar moth [larva] (<i>tyria jacobaeae</i>)	Snailbeach Mine SJ375022	05/08/1993	DP	UKBAP
Otter	Scott Level SJ378021	28/01/2007	SBG	UKBAP

Common dormouse [1]	Snailbeach Mine SJ375022	09/09/1997	CT	UKBAP
Daubenton's bat [1]	Snailbeach Mine SJ375022	10/01/1985	AML	LBAP
Natterer's bat [2]	Snailbeach Mine SJ372020	12/12/1993	AML	LBAP
Natterer's bat [2]	Snailbeach Mine SJ375022	27/02/1993	AML	LBAP
Natterer's bat [2]	Snailbeach Mine SJ382023	27/02/1993	AML	LBAP
Natterer's bat [2]	Snailbeach Mine SJ375022	18/01/1995	AML	LBAP
Natterer's bat [1]	Snailbeach Mine SJ378021	29/01/2006	SBG	LBAP
Brown long-eared bat [1]	Scott level SJ378021	28/01/2007	SBG	UKBAP
Brown long-eared bat [6]	SJ3702	15/09/1979	Unknown	UKBAP
Lesser horseshoe bat [4]	Snailbeach Mine SJ375022	10/01/1985	AML	UKBAP
Lesser horseshoe bat [2]	Snailbeach Mine SJ375022	10/01/1985	AML	UKBAP
Lesser horseshoe bat [1]	Snailbeach Mine SJ375022	01/1985	MP	UKBAP
Lesser horseshoe bat [15]	Snailbeach Mine SJ375022	27/02/1993	AML	UKBAP
Lesser horseshoe bat [5]	Snailbeach Mine SJ375022	06/03/1993	AML	UKBAP
Lesser horseshoe bat [1]	Snailbeach Mine SJ378023	12/12/1993	AML	UKBAP
Lesser horseshoe bat [1]	Snailbeach Mine SJ378023	24/04/1993	AML	UKBAP
Lesser horseshoe bat [14]	Snailbeach Mine SJ378023	27/02/1993	AML	UKBAP
Lesser horseshoe bat [10]	Snailbeach Mine SJ375022	18/01/1995	AML	UKBAP
Lesser horseshoe bat [2]	Snailbeach Mine SJ378021	30/01/2005	JM	UKBAP
Lesser horseshoe bat [36]	Perkins Level SJ382023	09/01/2005	JM	UKBAP
Lesser horseshoe bat [2]	Snailbeach Mine SJ378021	29/01/2006	SBG	UKBAP
Lesser horseshoe bat [4]	Snailbeach Mine SJ378021	28/01/2007	SBG	UKBAP
Lesser horseshoe bat [1]	Scott Level SJ378021	28/01/2007	SBG	UKBAP
Lesser horseshoe bat [45]	Perkins Level SJ382023	27/01/2007	SBG	UKBAP
Forester moth [1] (<i>adscita statice</i>)	Snailbeach SJ374023	1998	JJ	UKBAP
Hoverfly [1] (<i>criorhina ranunculi</i>)	Lordshill SJ380021	2009	N. Jones	LBAP
Crane fly [1] (<i>gonomyia lucidula</i>)	Snailbeach SJ374023	2007	F.W. Edwards	LBAP
Crane fly [1] (<i>gonomyia lucidula</i>)	SJ3702	1921	FWE	LBAP

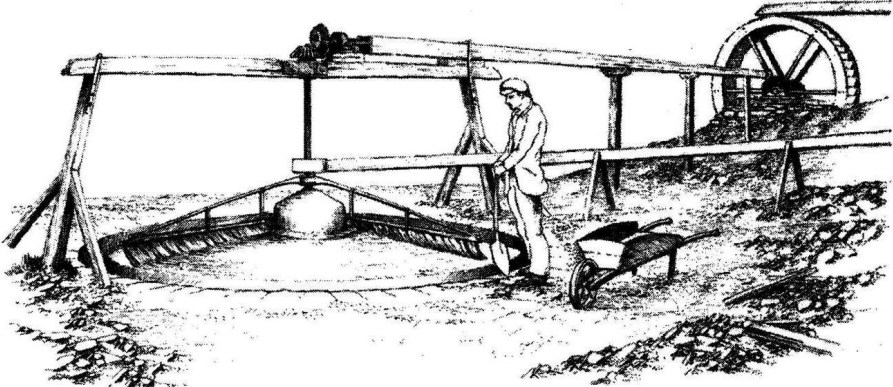
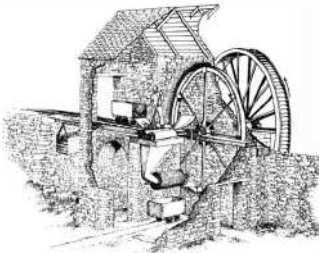
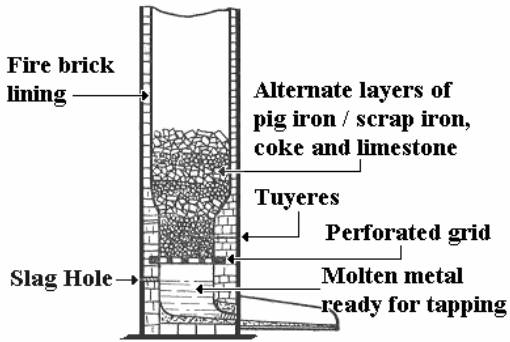
Cranefly [1] (<i>gonomyia lucidula</i>)	SJ3702	2007	FWE	LBAP
Grayling [1]	Snailbeach Mine SJ374022	04/07/2003	R. Southwell	UKBAP
Grayling [16]	Snailbeach Mine SJ374022	04/07/2003	RS	UKBAP
Grayling [1]	Snailbeach Mine SJ374024	31/05/1994	JJ	UKBAP
Grayling [1]	Snailbeach Mine SJ374023	14/05/2994	JJ	UKBAP
Grayling [2]	Snailbeach Mine SJ374022	09/08/1995	JJ	UKBAP
Grayling [1]	Snailbeach Mine SJ374022	09/08/1995	JJ	UKBAP
Grayling [4]	Snailbeach SJ3702	07/08/2001	B. Davidson	UKBAP
Grayling [10]	Snailbeach SJ3702	17/07/2004	BD	UKBAP
Grayling [1]	Snailbeach SJ3702	29/07/2005	P. Branson	UKBAP
Grayling [6]	Snailbeach SJ3702	19/07/2005	JJ	UKBAP
Grayling [1]	Snailbeach Mine SJ3602	1993	DP	UKBAP
Grayling [10]	Snailbeach Mine SJ3602	1993	DP	UKBAP
Cranefly [1] (<i>neolimnophila carteri</i>)	Snailbeach SJ374023	01/01/2007	FWE	LBAP
Cranefly [1] (<i>neolimnophila carteri</i>)	Snailbeach SJ3702	01/01/1921	FWE	LBAP
Hoverfly [1] (<i>platycheirus granditarsus</i>)	Snailbeach SJ373022	25/06/2009	N. Jones	LBAP
Shaded broadbar [1] (<i>scotopteryx chenopodiata</i>)	Snailbeach Mine SJ375022	06/08/2004	P. Boardman & I. Cheeseborough	UKBAP
Hoverfly [1] (<i>sericomyia lappona</i>)	Snailbeach SJ373022	25/06/2009	NJ	LBAP
Lunar hornet moth [1] (<i>sesia bembeciformis</i>)	Snailbeach Mine SJ374022	22/08/2007	D. Green & S. Clarke	LBAP
Tachinid fly [1] (<i>tachina grossa</i>)	Snailbeach SJ3702	30/08/2008	NJ	LBAP
Tachinid fly [1]	Snailbeach SJ3702	01/08/2008	NJ	LBAP
Cinnabar moth [1]	Snailbeach SJ374023	1998	JJ	UKBAP
Cinnabar moth [1]	Snailbeach Mine SJ374025	05/08/1993	DP	UKBAP
Cinnabar moth [1]	Snailbeach Mine SJ375022	15/06/2004	PB & IC	UKBAP
Wood anemone (<i>anemone nemorosa</i>)	'Shropshire' at NGR SJ30R	1993	D. Norrell	LBAP
Navelwort (<i>umbilicus rupestris</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Bitter vetch (<i>lathyrus linifolius</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Hop trefoil (<i>trifolium campestre</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Wood sorrel (<i>oxalis acetosella</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Wood spurge	'Shropshire' at NGR	1993	DN	LBAP

(<i>euphorbia amygdaloides</i>)	SJ30R			
Wild pansy (<i>viola tricolor</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Fairy flax (<i>linum catharticum</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Slender St John's wort (<i>hypericum pulchrum</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Long stalked crane's bill (<i>geranium columbinum</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Spurge laurel (<i>daphne laureola</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Heather (<i>calluna vulgaris</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Bilberry (<i>vaccinium myrtillus</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Bugloss (<i>anchusa arvensis</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Yellow archangel (<i>lamiastrum galeobdolon</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Common cow wheat (<i>melampyrum pratense</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Eyebright (<i>euphrasia officinalis</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Sheep's bit (<i>jasione Montana</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Goldenrod (<i>solidago virgaurea</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Moschatel (<i>adoxa moschatellina</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Sanicle (<i>sanicula europaea</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Ramsons (<i>allium ursinum</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Bluebell (<i>hyacinthoides non-scripta</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Hairy woodrush (<i>luzula pilosa</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Wood melick (<i>melica uniflora</i>)	'Shropshire' at NGR SJ30R	1993	DN	LBAP
Ramsons	'Shropshire' at NGR SJ30R	1986	Unknown	LBAP
Soft shield fern (<i>polystichum setiferum</i>)	Snailbeach SJ3702	2002	S. J. Whild	LBAP
Salad burnet (<i>poterium sanguisorba</i>)	Snailbeach SJ3702	2008	SJW	LBAP
Wood sorrel	Snailbeach SJ3702	2002	SJW	LBAP
Fairy flax	Snailbeach SJ3702	2002	SJW	LBAP
Fairy flax	Snailbeach SJ3702	2008	SJW	LBAP
Spurge laurel	Snailbeach SJ3702	2002	SJW	LBAP
Sweet woodruff (<i>gallium odoratum</i>)	Snailbeach SJ3702	2002	SJW	LBAP
Yellow archangel	Snailbeach SJ3702	2002	SJW	LBAP
Wild marjoram	Snailbeach SJ3702	2008	SJW	LBAP

(<i>origanum vulgare</i>)				
Eyebright	Snailbeach SJ3702	2002	SJW	LBAP
Moschatel	Snailbeach SJ3702	2002	SJW	LBAP
Bluebell	Snailbeach SJ3702	2002	SJW	LBAP
Bluebell	Snailbeach SJ3702	2008	SJW	LBAP
Hairy woodrush	Snailbeach SJ3702	2002	SJW	LBAP
Wavy hair grass	Snailbeach SJ3702	2002	SJW	LBAP
Wood melick	Snailbeach SJ3702	2002	SJW	LBAP
Spurge laurel	Snailbeach SJ374024	1989	D. Norrell	LBAP
Upright chickweed (<i>moenchia erecta</i>)	Lordshill SJ380021	2008	D. Wrench	LBAP
Long bracted hawkweed (<i>hieracium Cinderella</i>)	Snailbeach SJ374022	2002	A.K. Thorne	LBAP
Golden scaled male fern (<i>dryopteris affinis</i>)	Resting Hill SJ37270192	1995	SJW	LBAP
Wood sorrel	Resting Hill SJ37250183	1995	SJW	LBAP
Wood sorrel	Resting Hill SJ37470196	1995	SJW	LBAP
Wood sorrel	Resting Hill SJ37330206	1995	SJW	LBAP
Heather	Resting Hill SJ37250183	1995	SJW	LBAP
Bilberry	Resting Hill SJ37250183	1995	SJW	LBAP
Bilberry	Resting Hill SJ37470196	1995	SJW	LBAP
Yellow archangel	Resting Hill SJ37470196	1995	SJW	LBAP
Common cow wheat	Resting Hill SJ37250183	1995	SJW	LBAP
Bluebell	Resting Hill SJ37250183	1995	SJW	LBAP
Bluebell	Resting Hill SJ37470196	1995	SJW	LBAP
Hairy woodrush	Resting Hill SJ37470196	1995	SJW	LBAP
Spiked sedge	Lordshill Farm SJ37970212	2007	A.J. Lockton	LBAP
Wavy hair grass	Resting Hill SJ37250183	1995	SJW	LBAP
Wavy hair grass	Resting Hill SJ37470196	1995	SJW	LBAP
Wood melick	Resting Hill SJ37250183	1995	SJW	LBAP

APPENDIX 4: GLOSSARY AND SUMMARY OF LEAD-MINING PROCESSES

Technical glossary

Adit	Horizontal tunnel into a mine
Balance box	A counterweight attached to an engine pump rod to assist in raising
Balance bob	The beam of a balance box or steam engine
Barites	Barium sulphate – used in the manufacture of paint and paper (BaSO_4)
Buddling	Crushed ore mixed with water to form a slime is poured into a buddle (a wooden frame or similar device); the heavier metal-bearing material settles and can be easily separated. The process is similar to that used in modern sewage-treatment. 
Classifier	A device, for separating the solid particles in a mixture of solids and liquids into fractions according to particle size or density. Similar to a buddle.
Condenser	A (usually) brick-lined flue connecting the smelters to a chimney; as it cooled gaseous lead was deposited on the tunnel walls and could be collected
Crusher house	A building housing a large flywheel which operated crushing machinery and was the first stage of the ore-extraction process following mining. 
Cupola furnace	<p>A refractory-lined steel stack 20 to 35 feet high, resting on a cast-iron base plate with four steel legs. Forced air for combustion enters the cupola through openings (tuyeres) spaced around the rim of the lower portion of the cupola. Ore, coke, and limestone flux are placed on a bed of coke high enough to hold the ore above the tuyere openings, where the temperature is the highest. The melting is continuous, and molten metal may be allowed to flow continuously through an open tapping spout at the base of the cupola.</p> 

Fathom	Unit of measurement – 6 feet
Fault	Dislocation of strata (rock beds) by earth movement
Flat rods	Horizontal beams for transmitting motion from an engine or waterwheel to a shaft some distance away
Galena	Lead sulphide (PbS)
Gin	Engine
Grizzly	A large sieve-like machine, when vibrated assists separating different sized ore.
Halvans	Ore-bearing rock not considered worthy of recovery
Incline plane	A sloping surface, used for raising heavy bodies. The force required to move an object up the incline is less than the weight being raised, discounting friction.
Jigger	Mechanical sieve for separating ore from waste material
Kibble	Barrel-shaped iron bucket for raising ore
Level	Horizontal tunnel
Lode	Ore deposit
Leat	Surface water course
Magazine	Well-constructed building for the storage of gunpowder and charges used for blasting stone to extract ore
Ore	Mined mineral
Reverberatory furnace (also known as a blast furnace)	A furnace used for smelting or refining in which the fuel is not in direct contact with the ore but heats it by a flame blown over it from another chamber. The heat passes over the hearth, in which the ore is placed, and then reverberates back. The roof is arched, with the highest point over the firebox. It slopes downward toward a bridge of flues that deflect the flame so that it reverberates. The process is continuous in the reverberatory furnace: ore concentrate is charged through openings in the roof; slag, which rises to the top, overflows continuously at one end; and the matte is tapped at intervals from the deepest part of the ore bath for transfer to a converter, where it is further refined.
Sett	Leased area of mine
Shaft	Vertical entrance to a mine
Slag	Waste material produced in molten form during the smelting process
Sough	Drainage level
Smelting	The process of heating galena to produce lead
Sump	Underground shaft driven downwards
Stope	Worked out vein, left as an open cavity
Vein	Vertical or near-vertical deposit of ore, often in a fault
Winder	Steam engine used for winding in a shaft
Winze	Underground shaft driven downwards

Conservation glossary

Conservation	The management of change
Conservation area	Section 69 of the Civic Amenities Act 1967 gives local councils the power to designate as Conservation Areas, "areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance". Conservation areas are a well established designation employed by local planning authorities to manage areas of special architectural or historic interest. Effective management of conservation areas relies upon the preparation of a character appraisal and accompanying management plan.
Consolidation	The repair of masonry to make safe and slow deterioration. Does not include the introduction of new material.
Heritage at Risk	Heritage at Risk is English Heritage's national programme that provides evidence on the condition of the historic environment, highlighting those historic sites which are most 'at risk' of serious disrepair. It encompasses Grade I and II* listed buildings (and Grade II in London), scheduled monuments, conservation areas, registered parks and gardens, registered battlefields and protected wreck sites.
Local list	Local listing helps to raise the profile of local heritage by identifying heritage assets that are of greatest importance to local people. Planning Policy Statement 5 also highlights the contribution of local listing to the development of the evidence base used to support local plan making. Local lists can be drawn up by, for example, interest groups and community groups, often under the guidance of a local authority conservation officer. Local heritage assets can range from buildings, designed landscapes, archaeology and elements of the natural environment. By involving local people in their preparation, local lists and the practices and processes that support them represent a voluntary agreement between local planning authorities and community representatives on how local heritage assets are managed.
Listed building	Listing is an identification stage where buildings are marked and celebrated as having exceptional architectural or historic special interest, before any planning stage which may decide a building's future. English Heritage takes the lead in identifying sites in England which should be placed on the list by the Secretary of State for Culture, Media and Sport.
Restoration	Returning the original fabric of a place to a known earlier state by removing accretions or by reassembling existing components with the introduction of new material
Reconstruction	Returning a place to a known earlier state, distinguished from restoration by the introduction of a new material into the fabric
Scheduled Monument	'Scheduling' is shorthand for the process through which nationally important sites and monuments are given legal protection by being placed on a list, or 'schedule'. English Heritage takes the lead in identifying sites in England which should be placed on the schedule by the Secretary of State for Culture, Media and Sport.

Taken from various sources including Shropshire Mines Trust *Snailbeach Mine Shropshire* (2008), R.A. Buchanan *Industrial archaeology in Britain* (1974), the English Heritage website www.english-heritage.org.uk

The lead mining process

Mined since ancient times, lead is extracted from the earth in the form of galena (lead sulphide), usually associated with limestone deposits. By the seventeenth century surface mining was replaced by deeper mines, often resulting in problems with hitting the water table and therefore a draining tunnel (sough) was needed, later replaced by horse gins and steam pumping engines.

Galena was mined in several different ways. Gunpowder was used at the mine from the seventeenth century to drive shafts deeper; it was used to fill holes drilled up to two feet deep in the rock face, initially by hand and later with the assistance of compressed-air drills and dynamite, with the benefit of achieving up to six feet a day. Strands of straw were filled with dynamite for use as fuses. Ore-bearing rock hewn from the shaft sides was broken up into smaller pieces, and transported along the levels by small trucks, moved by the miners pushing them. It was then brought up the shaft and to the surface in kipples, using the pit head gear, or headstock. This was driven by a winding engine. A pump to extract water from the mine was often operated through the same shaft, driven by a pumping engine (these usually take the form of the 'typical' Cornish engine house where beam engines were used).

Once it has been mined the lead has to be extracted, or smelted. The ore-bearing materials are first dressed by breaking them down into smaller pieces and then into a powder. In the nineteenth century this was done at Snailbeach by a steam-powered flywheel driving heavy rollers at the crusher house. The powder is then mixed with water to separate the heavy ore from the lighter materials, achieved at Snailbeach through the process of buddling. The ore was then taken to a smelter, which used either a reverberatory furnace or a blast furnace. The reverberatory (or cupola) furnace had fuel on one side and ore on the other with a domed roof and was fed by the draft from a chimney, usually placed a distance from the smelting site. In a blast (or hearth) furnace the ore is mixed with charcoal or coke and limestone and the slag and molten metal is drawn off at the bottom. Blast furnaces were often used for the production of cast iron and steel.

At the smelter the crushed ore was heated with air in a furnace, and once sufficiently heated the air supply cut off. As such, any sulphur is driven off as a gas and the molten lead could be drained off from any unwanted material floating (slag) on top of the molten metal. The lead was run off into sand moulds to form ingots or bars called pigs typically weighing around 130lbs. The slag invariably still contained an amount of lead, and the slag was further worked in a slag mill using a reverberatory furnace.

At some works the lead was further processed on site, usually to produce rolls of lead sheet. The lead pigs from Snailbeach were transported to Burr Brothers in Shrewsbury. Lead has many uses and can be added to pottery glazes and glass (lead crystal), and has been used to make motor car batteries and tetraethyl lead, the agent used in petrol until the 1990s. Lead can then be subjected to further processes to produce, for example lead carbonate which was used in paint until the 1960s, and red lead (lead oxide) used in glass manufacture.

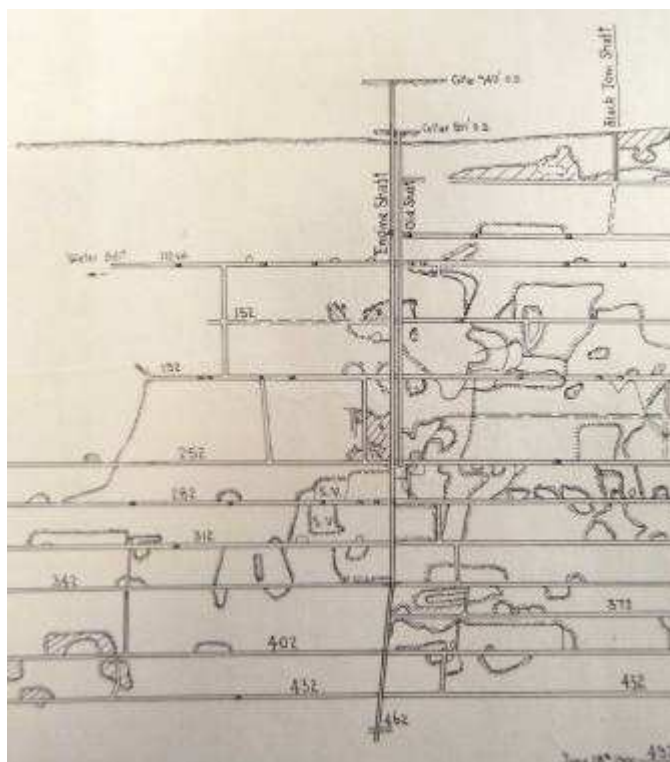
APPENDIX 5: SUBTERRANEAN ARCHAEOLOGY

“It is clear that the underground mining landscape is a historical document that is currently being almost wholly ignored in the UK”.

NOTE: Anything that falls within the red-line of scheduling at surface will be protected as far as the centre of the Earth – this is a key issue considering the extent of passages and shafts which extend beyond the scheduling at surface. This becomes particularly evident when viewing historic cross-sections of the mine setts.

Surveys should aim to identify features of at least regional importance, e.g. solid rock-cut features. Issues include access by EH inspectors both for assessment prior to scheduling and for management. Guidelines for the descriptive recording of subterranean archaeology can be found here: <http://www.vmine.net/namho-2010/documents/descriptivespec.pdf>

LIDAR may be useful for finding and analysing leat routes, particularly at sites such as Snailbeach where there is dense vegetation.



Contacts:

- Peter Cloughton (NAMHO)
- Jon Humble (EH East Midlands IAM)
- Robert Waterhouse (fire setting underground in the Tamar Valley)
- John Barnett (Peak District NP Archaeology; underground assessment at Ecton Copper Mine)
- Stephen Hughes at RCAHMW (Cwmystwyth/Furnace survey)
- Martin Roe (NAMHO Conservation officer)
- Shane Gould (EH NHPP)
- St Just Mines Research Group (research into stoping techniques)

Research programmes/priorities:

SHAPE

Sub-Programme Name New Frontiers: Understanding subterranean places

Sub-Programme Number 11112.210

Corporate Objective 1A: Ensuring that our research addresses the most important and urgent needs of the historic environment

Activity Type and Programme RESEARCH A2: Spotting the gaps: Analysing poorly understood landscapes, areas and monuments

Sub-Programme Description Exemplar projects developing research-based approaches to significant subterranean archaeology, architecture and material culture. Such projects will include caves and fissures, mines, shafts, subterranean defences, tunnelled infrastructure and the like. Examples might include:

- Basic structural and mapping surveys
- Stratigraphic evaluations of cave deposits

- Recording of contents, fixtures, decoration, graffiti etc
- Associated historical research

Reason for EH Support Distinct need to develop evidence-base for a poorly-understood, but significant area of the historic environment

Research categories NABS SETI *Primary purpose* Frascati *Definition* Research Areas

11.9 C Strategic-Applied Humanities

Similar Sub-Programmes Will inevitably cross-cut on a range of Programme A1 Sub-Programmes, but used here specifically for subterranean projects

NATIONAL HERITAGE PROTECTION PLAN

4B2 'TRADITIONAL INDUSTRY, MODERN INDUSTRY, MINING AND ASSOCIATED HOUSING'

A pilot project will be commissioned (by EH) on the designation of subterranean remains during financial year 2012/13 – “largely to examine the sometimes complex legal, technical, procedural and management issues and range of vulnerabilities that can affect subterranean remains”. (Source: Jon Humble).

ST JUST MINES RESEARCH GROUP (Levant Mine submarine mines)

Recent survey and documentary evidence suggests that the current knowledge of stoping techniques can be challenged.

APPENDIX 6: SOURCES

This list of sources is intended as a starting point for furthering understanding before undertaking future development or conservation work at Snailbeach Lead Mine and the New Smeltnill. It will facilitate the sourcing of material for further research and also highlights previous surveys and reports. Whilst it aims to be exhaustive in its exploration of the primary archives, there will certainly be further collections of material throughout the country, for example in mining centres in the Peak District and Yorkshire. Not all sources have been viewed or studied. A summary of a report's contents has been included where it is thought that source will be particularly useful to future research and analysis.

The list is arranged according to the location of sources. These are:

- National Monuments Record (NMR) Archives and Library, Swindon
- Shropshire Local Studies Library and Archives, Castle Gates, Shrewsbury
- Shropshire Historic Environment Record, Shirehall, Shrewsbury
- Shropshire Caving and Mining Trust
- Shropshire Mines Trust

These lists are followed by further useful **general publications**, **natural environment resources** (referenced from the 2006 Management Plan), and a **bibliography** of publications and websites used and referenced in the compilation of this report. There is a further extensive bibliography in the LUAU report (1990), Vol.II, Appendix C.

NATIONAL MONUMENTS RECORD (NMR) ARCHIVES, SWINDON

BF042509 – Literature file including:

I. J. Brown *Historic Industrial Scenes: the Mines of Shropshire* (1976).

'The Snailbeach District Railways' in J. S. Morgan *Colonel Stephen's Railways* (1978).

N. A. Chapman, Imperial scale drawings of Lordshill engine house and Old Shaft winding house; and description of the engine house (1979), and drawings of the compressor house (1982).

BF042508

N. A. Chapman, Imperial scale drawings of Tankerville engine house, including two elevations; and plan and elevations of Ovenpipe winder house (1983).

BF092711

Richard K. Morriss *The Blacksmith's Shop, Snailbeach Mine, Shropshire: An interim report* City of Hereford Archaeology Unit, Hereford Archaeology Series 132 (1992).

89/01534 (Photos)

76 photographs including by the Clwyd Powys Archaeological Trust (1990).

Red boxes - photograph of the reservoir (1967).

AA049899 - photograph: 'exterior view of complex' (2005).

Aerial vertical and oblique photographs, dating from the mid and late C20, including WW2 reconnaissance photographs.

NMR LIBRARY, SWINDON

D. Cranstone *Monuments Protection Programme Step 3 reports – Lead mining* (1991).

J. A. Heathcote 'A Survey of the Metal Mines of South-west Shropshire' in Shropshire Caving and Mining Club Account no.12 (1979).

C. Stoertz *The Marches Uplands Mapping Project: a Report for the National Mapping Programme* English Heritage Aerial Survey report series AER/1/2004 (2004).

L. Moissenet, 'Traitement de la Galene au Tour Gallois' in *Annales des Mines*, 6th series, tome I (1862) - also available translated into English by H.M Martell & M. Gill 'Lead Smelting in Welsh Furnaces at Pontesford, Shropshire' in *Bulletin on the Peak District Mines Historical Society* Vol.11, Number 6 (Winter 1992), pp.297-312, available online: <http://www.pdmhs.com/PDFs/ScannedBulletinArticles/Bulletin%2011-6%20-%20Lead%20Smelting%20in%20Welsh%20Furnaces%20at%20Pontesfo.pdf>

SHROPSHIRE LOCAL STUDIES LIBRARY, CASTLE GATES, SHREWSBURY

Library pack of the Stiperstones mining area, including photocopies of the following:

G. H. Morton *The Mineral Veins of Shelve* (n/d)

T. Wright 'An excursion to the Roman lead mines in the parish of Shelve' in *Illustrated London News Supplement* October 4 1856.

T. C. F. Hall *The Distribution and Genesis of Lead and Associated Ores in West Shropshire* (c.1920).

E. C. Wadlow 'The Story of Shropshire's Lead Industry' in *The Metal Industry* July 27 1934.

The Mining Journal, Railway and Commercial Gazette April 2 1870.

'Notes on the lead smelt houses of the South Shropshire Mining Area' reproduced from *Shropshire Caving and Mining Club Journal* (1980).

T. J. Davies 'The Smaller Engine Houses in South Shropshire' reproduced from *Shropshire Caving and Mining Club Journal* (1976).

I. J. Brown *Metal Accidents in the South Shropshire Metalliferous Mining Area 1875-present* (1967).

F. Brook 'Snailbeach Lead Mine – A company history' reproduced from *Shropshire Caving and Mining Club Journal* (1976).

Eric S. Tonks *The Snailbeach District Railways* (1950)

R. V. Davies *A Brief Account of the Geology, History and Mechanisation of the Snailbeach Mine, Shropshire* (c.1967).

'Industrial Legacy' in *Shropshire Magazine* Vol. 7, No.10, February 1957.

M. Newton 'Snailbeach – Shropshire's Greatest Lead Mine' in *Shropshire Magazine* October 1978.

Shropshire Magazine also: April 1963 (workers); July 1972 (work); October 1977 (railway); September 1985 (railway).

M. Allbutt and F. Brook *The Snailbeach Mining Company 1767-1911* (n/d).

Shropshire Caving and Mining Club Journal:

- D. R. Adams, Dec 1962, account No.2 & 4
- J. A. Heathcote, account No.12 (survey of metal mines)
- I.J. Brown and T.J. Davies, July 1972, account No.10 (plans and sections)

Maps

1752 Map of Shropshire, surveyed by J. Rocque.

1766 'Map of Minsterley Hall Demise together with famrs in several parishes of Westbury and Worthen in the County of Salop belonging to Rt. Hon. Lord Weymouth' surveyed by J. Davis (estate map).

1808 Map of Shropshire, surveyed by Robert Baugh.

1827 Map of Shropshire, surveyed by C. & J. Greenwood.

1838 Tithe 'Plan of the Township of Minsterley in the Parish of Westbury in the County of Salop, 1838'.

1847 Tithe 'Plan no.1 comprising the Township of Habberley Office part of the Quarter or District of Heath in the Parish of Worthen in the County of Salop, 1847'.

1882 Ordnance Survey (1:2500) surveyed 1881.

1901 Ordnance Survey (1:2500) surveyed 1881, revised 1901.

SHROPSHIRE ARCHIVES, CASTLE GATES, SHREWSBURY

Photographs of Snailbeach from the 1940-70s, and of the Smeltpmill in the 1970s (Shropshire Photography Society permission required for reproduction and copyright).

Plan of Snailbeach Sett, longitudinal section, November 1909 (1921 copy), showing Black Tom, ladder, Engine and Chapel Shafts, and also the line of the condenser tunnel from the Smeltpmill.

Richard Morris, Tankerville report, City of Hereford Archaeology Unit (1991).

Ove Arup, Snailbeach Lead Mine Study, April 1985, Vol. III (Appendices; including biodiversity survey, list of archival sources, survey drawings of some buildings including the Candlehouse).

Wardell Armstrong, Snailbeach Lead Mine Stage 2 study, Phase I report, September 1988, Vol. I (includes descriptions and condition assessment of standing buildings, related to drawings in Vol. III (missing)).

Wardell Armstrong, Snailbeach Lead Mine Stage 2 study, Phase I report, September 1988, Vol. II (Appendices; including references, inspections of adit, ore tunnel, smelter flue, reservoir, levels of metals in soil and water).

- The last three sources are also described under Shropshire Historic Environment Record, below

328/2/4	Tankerville Sett (named as Pennerley Sett). Reduced and traced by R. Blight March 1921, retraced by T. E. Vaughan April 1963.
328/2/5	Snailbeach cross sections. Drawn from original data by T. E. Vaughan 1963.
328/2/6	Snailbeach longitudinal section, 66ft to the inch. Surveyed by Captain Oldfield 1909, reduced and traced by R. Blight March 1921, retraced by T. E. Vaughan April 1963.
4743/18 (Dennis collection)	Plan of underground workings, c.1909. Levels down to 1909 marked and boundary of Halvans inscribed in pencil (perhaps a later addition).
4743/19 (Dennis collection)	Plan of mine workings 1867.
4743/26 (Dennis collection)	Annotated 1882 1:2500 OS (surveyed 1881), showing Reservoir, water leats and pipes. Dated 1883.
4743/29 (Dennis collection)	Plan of pipes laid near Chapel Shaft, Jan 30 1875. Stamped by Henry Dennis. Could be contemporary to construction of Reservoir.
4743/34 (Dennis collection)	Trends of veins at Snailbeach
4743/47 (Dennis collection)	Plan of Snailbeach railways, c.1875.
4748/48 (Dennis collection)	Snailbeach railway plan on main line and branches, 40ft to the inch, c.1875.
4773/25 (Dennis collection)	Snailbeach surface map, on a tracing of 1882 1:2500 OS map (surveyed 1881). Stamped 'Henry Dennis Ruabon 17 March 1882'.

SHROPSHIRE HISTORIC ENVIRONMENT RECORD, SHIREHALL, SHREWSBURY

Watching briefs and archaeological reports

SSA22896	Hannaford, Hugh R. <i>The Stiperstones Hills Archaeological Survey: research design</i> (2003). NOTE: Snailbeach is outside of the project area.
SSA22123	Hannaford, Hugh R. <i>The Stiperstones Hills Archaeological Survey: assessment report and updated research design</i> SCCAS Rep. 231.2. (2004).
SSA22882	Hannaford, Hugh R. <i>The Stiperstones Hills Archaeological Survey: a report for land management purposes</i> SCCAS Rep. 238 - 3. (2006).
SSA3491	Chapman, N. <i>Summary of buildings at Snailbeach and their condition</i> (1981). NOTE: Very brief notes on condition of principal buildings.
SSA3500	Tildesley, B. <i>Snailbeach Mine: proposal for a conservation project</i> (1984). NOTE: Also noted in outline of HER sources: "In 1984 a rapid survey of surface remains at Snailbeach lead mine was carried out by Brian Tildesley, a student from the Institute of Industrial Archaeology, Ironbridge, as part of an interpretation study to provide proposals for the conservation of the site". See summary for contents.
SSA3499	Ove Arup and Partners Ltd. <i>Snailbeach Lead Mine Study Stage I</i> (April 1985). NOTE: In three volumes: Vol. I-Text; Vol. II-Figures; Vol. III-Appendices. Also noted in outline of HER sources: "In 1985, Stage I of an intensive study of Snailbeach lead

- mine and the environment in the immediate vicinity commenced. This consisted of a review of all available information relating to the mine and included an on-site reconnaissance survey of the surface and underground remains of the mine workings, the mine buildings and structures, and the waste tips." See summary for contents (page 142).
- SSA3501 Wardell Armstrong Ltd. *Snailbeach Lead Mine Stage II - Feasibility Study - Phase I* (June 1988).
NOTE: In three volumes: Vol. I-Report; Vol. II-Appendices; Vol. III-Plans. See summary for contents (page 144).
- SSA23055 Wardell Armstrong Ltd. *Snailbeach Lead Mine Stage II Study - Phase I* (September 1988).
NOTE: Two volumes: Vol. I-Text; Vol. II-Appendices. Repeated material from SSA3501.
- SSA23056 Wardell Armstrong Ltd. *Snailbeach Lead Mine Stage II Study – Phase II & III* (December 1989).
NOTE: Three volumes: Vol. I-Text and plans; Vol. II-Technical Appendices; Vol. V-Photos.
- SSA23057 Wardell Armstrong Ltd. *Report on retaining walls and bridge abutments in the Snailbeach reclamation area* (November 1991).
- SSA3495 Hannaford, Hugh R. *Archaeological monitoring of land reclamation works at Snailbeach Lead Mine* SCCAS Rep. 35. (August 1993).
NOTE: Interim report. Also incorporated in SSA3493. Noted in outline of HER sources: "In February 1993 work began on Phase I of the Snailbeach Mine Reclamation Works. The SCC Archaeology Unit monitored the reclamation work and recorded a range of features that were revealed in the process". See summary for contents (page 145). Also related to SSA3493.
- SSA3493 Hannaford, Hugh R. & Price, G. *A watching brief at Snailbeach Lead Mine* SCCAS Rep. 58. (January 1995).
See summary for contents (page 145).
- SSA3494 Hannaford, Hugh R. & Price, G. *Building recording and archaeological monitoring of consolidation works at Snailbeach Lead Mine* SCCAS Rep. 80. (1995).
NOTE: Crusher house complex and manager's office. Noted in outline of HER sources: "In 1995 repairs to the Crusher House Complex and Manager's office were carried out, and as part of this work, the SCC Archaeology Service carried out a programme of archaeological monitoring and recording". See summary for contents (page 145).
- SSA21035 Morriss, Richard K. *Snailbeach Lead Mine, Shropshire: an archaeological analysis & survey of the new engine shaft area* Mercian Heritage Series. 33. (February 1997).
NOTE: Noted in outline of HER sources: "In 1997 archaeological analysis and survey of the New Engine House Shaft was carried out. It was found that the structures around the New Engine shaft were constructed in a fairly short length of time and were abandoned at the same time." See summary for contents (page 145).
- SSA22543 Wardell Armstrong Ltd. *Report on photographic survey of stopes 5 and 5a at Snailbeach mine, Shropshire* (1997).
- SSA23054 Brown, I. J. *Snailbeach mine stage 2 study: industrial archaeology aspects of the study area* (1988).
See summary for contents (page 145).
- SSA23151 Brown, I. J. *The development of the surface water arrangements at Snailbeach mine* (1989).
- SSA23053 South Shropshire District Council. *Dangerous buildings-Old mine working structures-Snailbeach Area* (March 1977).
NOTE: Inspection of various mine structure at White Gritt, Gravels, Tankerville and Snailbeach areas. Includes photographs of building in various conditions; including Halvans Engine House, Tankerville Chimney; Ladywell mine; Westgritt.
- SSA23059 City of Hereford Archaeology Unit. *The Blacksmith's Shop, Snailbeach Mine, Shropshire: an interim report* Hereford Archaeology Series 132. (January 1992).
NOTE: Includes photographic survey and plan.
- SSA23146 Wardell Armstrong Ltd. *Completion report on Phase I of the reclamation works at Snailbeach village, Shropshire, for Shropshire County Council*. (February 1995).

- SSA23058 Richard K. Morriss & Associates. *Building survey of the powder magazine, Snailbeach Lead Mine: an interim report* (1995).
NOTE: Includes drawings of doorway and plan. Comparisons made to other Stiperstones powder magazines.

Monographs

- SSA3487 Ministry of Town and Country Planning. *The Problem of Snailbeach* (1945).
NOTE: Notes poor condition of houses, having been condemned by Ministry of Health. The area was being worked for barytes, and this was the principal occupation of inhabitants. The rural nature of the community and the 'foreignness' of Minsterley, and the White Tip as a blot on the landscape were also reported.
- SSA3492 Davis, R. V. *A Brief Account of the Geology, History and Mechanisation of the Snailbeach Mine* (1967).
NOTE: Includes photographs of the site in 1967. Photocopy. Also available at Shropshire Local Studies.
- SSA3496 Jones, D. M. *South Shropshire Mining area report: draft report on South Shropshire Area* Shropshire County Council Planning Department. (1978).

Journal articles

- SSA3490 Brown, I. J. 'An attempt to save the Snailbeach Mining Area from Land Reclamation' in *Journal of the Shropshire Caving and Mining Club* pp33-37 (1978).
- SSA3498 Newton, M. 'Snailbeach - Shropshire's greatest lead mine' in *Shropshire Magazine* (September 1978).

Meeting notes etc

- SSA3488 Shropshire Caving and Mining Club. *Liason with SSDC*. Shropshire Caving and Mining Club accounts, no.12. B13-B14 (1978).
NOTE: Discusses conservation of buildings and potential for scheduling and listing. Related to SCMC report from NMR?
- SSA3509 Hymas, Michael J. *Notes on a meeting held at Stone House, Ludlow* (1982).
NOTE: A meeting to discuss land reclamation.
- SSA3508 Hymas, Michael J. *Notes of a meeting held 13th Dec 1982* (1982).
NOTE: Notes that most of the land at Snailbeach is leased to British Gypsum by Mr J Roberts.
- SSA3510 Hymas, Michael J. *Notes on a meeting held 23rd Aug 1983* (1983).
NOTE: Regarding potential of grant money for buildings.
- SSA3507 *Notes on a lecture by I. Brown on 'The Snailbeach Area'* (1983).
NOTE: Notes taken by a Geological Society member.
- SSA3506 *Site visit: briefing note for Members of Council* (May 1983).

Drawings and plans

- SSA3514 Watson, Michael D. *Plan and location map of an adit located during pipe laying* (1984).
- Longitudinal section plan of mine, 1921 (redrawn in 1963).
NOTE: Located within SSA3499. Also available from Shropshire Archives.

Drawings and plans: related sources

- SSA10819 Chapman, N. *List of drawings of buildings at Shropshire lead mines* (1982).
NOTE: Drawings by Chapman; noted as being in the NMR.
- SSA3511 Sheldrake, P. *Four Notebooks owned by P. Marlyn of Snailbeach* (1995).
NOTE: The notebooks date from the mid C19 and contain drawings and notes of buildings and processes. A short description of what is in them and photocopies of several pages from the notebooks is included.

Correspondence

- SSA3505 South Shropshire District Council. *Correspondence*. 10/02/1983.
NOTE: Regarding conservation area designation.
- SSA21187 English Heritage. *Scheduled Monument notification*. 1997. Scheduling Papers (New Scheduling, 20/03/1997). 21658
NOTE: The SMR file also includes a letter from SCMC in 1980 to the EH Listing Department requesting protection for the mine buildings - this was rejected.

Blue folder: drawings and photographs

- SSA3494 Crusher house complex – survey drawings:
1. site plan
 2. north external elevation of engine house
 3. south external elevation of engine house
 4. east external elevation of engine house
 5. east internal elevation of engine house
 6. south internal elevation of engine house
 7. north internal elevation of engine house
 8. east elevation of chimney stack
 9. north elevation of chimney stack
 10. west elevation of chimney stack
 11. south elevation of chimney stack
 12. north internal elevation of boiler house
 13. north external elevation of boiler house
 14. Boiler house, north wall, west end - external elevation
 15. Manager's office, east room, internal wall – south-west elevation
 16. Manager's office, west room, internal wall – north-east elevation
 17. Manager's office, west room - fireplace and chimney
 18. Manager's office, west room, north-west wall - internal elevation
 19. Manager's office, west room, north-east wall - internal elevation
 20. Manager's office, west room, north-east wall and chimney – external elevation
 21. Manager's office, west room, north-west wall and chimney – external elevation
- Variety of black and white photographs before reclamation works, probably originals of those used in the 1990 LUAU report.

Blue folders: SMR record file x2 (including:)

- 1
 - Lists of sources
 - Photocopied photos from I.J. Brown book
 - Photocopy of Moissenet article drawings at large scale
 - Letters
 - Photographs, including: George's Shaft headgear; reproductions of Snailbeach District Railway trains and workings; reservoir
 - Plan and inventory of the mine (December 1884)
- 2
 - Primary sources, including copies of maps:
 1. 1752 Rocque
 2. 1808 Burghley
 3. 1827 Greenwood
 4. OS series

5. Tithe

Photographs – negatives and photocopies

Record office list of sources

Photocopies of written and published sources (probably photocopied from record office education pack)

Not viewed

SSA23038 Hannaford Hugh R. *A watching brief at Snailbeach Lead Mine, Shropshire* SCCAS Archaeology Rep. 175 (2000).

PAW Files relating to Derelict Land Reclamation
24/01/86

Also available

Plan drawings made by M. Knight for Quadrennial Survey report, August 2011:

- Pumping engine
- Winding engine
- Manager's office
- Day Level entrance
- Crusher house
- Compressor House
- New winding engine
- George's Shaft
- Halvans engine house
- Buddles
- Blacksmith's shop

SHROPSHIRE HER: CONTENTS SUMMARIES OF PRINCIPAL SOURCES

SSA3500 - Tildesley, B. *Snailbeach mine: proposal for a conservation project* (Ironbridge Institute, 1984).

- Potted history of the site
- Set of photographs (1984)
- Justification for conservation :
 - Author notes comparison to Magpie Mine which is considered one of the most complete, but notes that the railway is specifically not comparable to other sites.
 - Gives suggestions for conservation – at this time the site was mostly privately owned, and the owner didn't consider it abandoned but dormant, and was waiting for an increase in ore value.
 - Barites processing equipment in place above reservoir at this time; and winch, jigger and classifier at Black Tom.
 - Author looked at potential for leaflets, signage, interpretation etc in comparison with Peak District sites.
 - Considered reconstruction of railway.
 - Hopper wagon from Snailbeach at ex-Welsh Highland depot at Kinnerley. Notes that the loco types used at Snailbeach are still in use in India.
 - Suggests setting up a trust, and having 'action groups' to develop specific amenities such as the SDR, and suggests using volunteers and 'youth labour'.
- Includes drawings by Chapman (1980) of compressor house and chimney, and magazine. The original drawings are held in the Ironbridge Gorge Museum library.

SSA3499 - Ove Arup and Partners Ltd. *Snailbeach Lead Mine Study Stage I* (April 1985).

Volume I – text: 'A review of all available information and a reconnaissance survey of the site'.

- Topics investigated: Nature conservation interest; condition and importance of buildings including means of making them safe; extent of area affected by underground and surface workings; location of mine

entries and means of making them safe; stability of underground workings and means of making them safe; stability, toxicity and composition of waste heaps including consideration of landscaping and amenity visitor facilities; alternative approaches to management.

- Brief history
- Geology and geomorphology
- Buildings (p.13): a general structural assessment (it is interesting to note that the ruinous structures are considered unimportant). Considers management options including wall capping.
- History of mine working and production methods: surface entrances; underground workings; stability of underground workings.
- Waste tips and contamination: including physical condition, exploitation, toxicity (after sampling the site was regarded as being contaminated with lead, cadmium and zinc).
- Hazard assessment: including buildings and mine structures; shafts, adits and workings; tips.
- Significance and potential: including impact of visitor development on residents. Considers variety of attractions including the railway, geology, natural history, caving and hiking.
- Development studies.

Volume II – Figures (maps)

- Black and white mapping of topography and vegetation (vegetation commented on as potential for habitat management);
- Land leased from Lord Bath to the Snailbeach Mining Co. based on Tithe maps; extent of surface development in 1864, based on Tithe maps;
- Extent of surface development in 1882, 1901 and 1972 based on OS maps;
- Geology;
- Labelled plan of buildings, ruinous and standing;
- Methods of mining taken from 'Lead and lead mining' by Lynn Willies;
- Main vein as shown in 1880 Tithe map;
- Plan of underground workings in 1860s;
- Mine section of workings near Black Tom; current location of shafts and spoil heaps;
- Spoil heaps in 1864;
- Study of waste tips and toxicity (including 1950s area of barites processing at Perkins Level);
- Planning constraints including reference to the Village Plan;
- Visual impact (White Tip noted as 'visible from a considerable distance. Contrasts vividly with surrounding visual landscape. Huge blot or a monument to early mining' – considered to be highly intrusive impact);
- Analysis: including areas best suited to redevelopment, areas of mining interest (including White Tip), access routes, potential areas of conflict between visitors and residents;
- Areas of ecological interest to be retained and protected;
- Strategies: including woodland management; visitor access; spoil heaps as vantage points and monuments; plan for the extensive development of the site as a major tourist attraction; areas requiring investigation (mainly shafts and adits).

Volume III – Appendices

- Ecological appraisal (including a list of plants recorded).
- Source lists, including:
 - Estate maps
 - Long list of all archival sources, including with Shropshire Archives references
 - D. Edge *Snailbeach Lead Mines 1782-1884* (Kesteven College of Education) [?? SRO ref: 3014/1]
 - Longueville Collection
 - Heville Hall Collection
 - Shropshire County Council collection
 - London sources, including Institute of Mining and Metallurgy
 - Northumberland County Record Office (Lord Tankerville deposited his records here)
 - Longleat collection maps and papers
 - Treasury Solicitor's office
- Chronological timeline 1761-1979
- Geological and mining reference list
- Building survey: not detailed but a record of condition at the time (1985).

SSA3501 - Wardell Armstrong Ltd. *Snailbeach Lead Mine Stage II - Feasibility Study - Phase I.*
(June 1988).

Vol. I – Report

Commissioned by SCC in 1987.

- Mining history and archaeological merit, including arguments for preservation, using material from SSA23054
- Mine workings:
 - Geology
 - Mining method
 - Mining stability
 - Hydrogeology
 - Schedules of shafts and adits
 - Mine entries
 - Shaft inspections of George's Shaft. Black Tom, Lordshill, Chapel Shaft
 - Stope inspection
 - Bats: initial bat survey April 1988; potential for roosting sites and report of evidence of them
 - Identifies areas for further investigation throughout.
- Surface buildings:
 - Description and condition;
 - Remedial works and restoration;
 - Approximate cost
- Biochemical investigation
 - Identifies that there are high lead levels in house dust.

Vol.II – Appendices

- Manpower and production
- References to mining history
- Mine adit inspections (n/d)
- Shropshire Caving Club sketch plans of shafts (1968, 1974)
- Shaft inspections (March 1988)
- Smelter flue inspection (13/05/1988)
- Ore-house tunnel inspection (13/05/1988)
- Reservoir inspection (26/04/1988)
- Particle size fraction and metal levels in White Tip (n/d)
- Surface water analyses and sample locations (n/d)
- Main geological soil survey (n/d)
- Soil survey; available lead
- Stream sediment analyses
- Mine adit and static water analyses
- Snailbeach house dust survey
- Biogeochemical references

Vol.III – Plans

- Set of architectural survey plans and elevations by Arrol & Snell (March 1988)
 - Locomotive shed
 - Blacksmiths shop
 - Winding engine
 - Changing house (Miners' Dry)
 - Compressor house
 - Ore house
 - Magazine
 - Pumping engine house
 - Smelter chimney
 - Ore dressing plant (Upper Works)
 - Chimney (Chapel Shaft)
 - Candle House
- Erosion survey of White Tip
- Wind direction and speed, annual results

- Metals in surface soil and vegetation

SSA23056 - Wardell Armstrong Ltd. *Snailbeach Lead Mine Stage II Study - Phase II & III* (December 1989).

Vol.I – Text and plans

- Using information from Stage I
- Reclamation and development strategy including detailed plans

Vol.II – Technical appendices: including planning context

Vol.V – Photographic supplement (December 1989) Colour photos of buildings and adits.

SSA3495 - Hannaford, Hugh R. *Archaeological monitoring of land reclamation works at Snailbeach Lead Mine* SCCAS Rep. 35 (August 1993).

- Phase I began in February 1993
- p1) Gray's Works: during removal of topsoil brick walls and plinths revealed; these were recorded before being destroyed as part of the decontamination. Black Tom pit head gear removed and drawn at scale 1:20.
- p2) Ladder shaft filled and covered as part of works – no visible remains. Tramlines found coming out of Adit J.
- p3) Sawbench located 20m NW of Black Tom shaft moved prior to treatment of adits H & I. Photographs and 1:50 scale drawings made. Spiral classifier in poor condition, photographed and drawn (spiral classifier and piston jigger drawings in SSA3493).

SSA3493 - Hannaford, Hugh R. & Price, G. *A watching brief at Snailbeach Lead Mine* SCCAS Rep. 58 (January 1995).

- p12) Phase II of reclamation works at White Tip:
 - Regrading and covering with inert material, large areas of the tip, and the installation of drains around the edges. The tip was landscaped, and covered in membrane and top soil.
 - The watching brief discovered that the waste wasn't dumped according to grade (this may have been suggested by the 1838 Tithe where site is shown as plots).
 - Description of the revealing of buddles, timber hand jiggers; plan of these and detailed drawings of buddles and jiggers, 1950s plant, Halvans engine house and dressing floors.
 - Photos of equipment around Black Tom, buddles, jiggers etc in situ.

SSA3494 - Hannaford, Hugh R. & Price, G. *Building recording and archaeological monitoring of consolidation works at Snailbeach Lead Mine* SCCAS Rep. 80 (1995)

- Crusher house complex
- Elevation drawings at scale of 1:20 of walls to be dismantled / partly dismantled.
- Detailed descriptive analysis of the crusher engine house, crusher boiler house and chimney, area between boiler and engine house, carpenter's shop, crusher house, and manager's office.
- Phased plans of surviving masonry of the complex at 1:500 scale.

SSA21035 - Morriss, Richard K. *Snailbeach Lead Mine, Shropshire: an archaeological analysis and survey of the new engine shaft area* Mercian Heritage Series. 33 (February 1997).

- Lordshill; actually Resting Hill
- Including plan drawings and description of each structure
- Suggestions for engine manufacture
- Incline railway analysis
- Phasing analysis

SSA23054 - Brown, I. J. *Snailbeach Mine stage 2 study: Industrial archaeology aspects of the study area* (1988).

- Report prepared for Wardell Armstrong
- The value of the site lies not in individual buildings but in the total setting.
- History:

- Tracing of 1872 plan of Snailbeach (from Longleat collections).
- Reproduction of drawing of barytes plant for Bog Mine.
- Analysis of buildings including a description, their use and a brief history.
- Excerpt from C. LeNeve Foster *Ore and Stone Mining* (1894) – description of candles and use of Candlehouse.
- Archaeological significance
- Significance of underground remains
- Appendices:
 - Sources
 - Manpower and output 1845-1912
 - Reclamation article.

SHROPSHIRE CAVING AND MINING CLUB: archive catalogue available from Andrew Wood

SHROPSHIRE MINES TRUST: archive catalogue available from Nick Southwick

GENERAL PUBLICATIONS: SHROPSHIRE MINING

'The Shropshire Lead Mines' in *Industrial Archaeology* Vol.11, No.2 (1974), p.72.

Burt, R., Waite, P., and Burnley R. *The Mines of Shropshire and Montgomery with Cheshire and Staffordshire* University of Exeter (1990).

Brown, I. J. 'Horses in Shropshire Mines' in *British Mining* No.39 (1989), pp.78-88.

Brown, I. J. 'Women Workers at Shropshire Mines' in *British Mining* No.39 (1989), pp.89-96.

Brown, I. J. 'The Shrewsbury Coalfield and the Pontesford Lead Smelters, Shropshire' in *Welsh Mines Society Newsletter* No.21 (1989), pp.7-8.

Brown, I. J. 'Burgam: Shropshire's Last Working Metal Mine' in *Bulletin of the Peak District Mines Historical Society*, Vol.11 No.2 (1990), pp.80-84.

Brown, I. J. and Hall, G. W. 'The Bog Mine near Minsterley, Shropshire' in *Mining Magazine* (April 1990).

Chapman, A. C. *South Shropshire Metal Mines: A desk study* (1997).

Chapman, N A. 'White Grit Lead Mine' in *British Mining* No.25 (1984), pp.18-25.

Davies, T. *Engine Houses of the Mines of South Shropshire* (1969).

Davies, T., M. Newton & A. Pearce *Mining remains in South-west Shropshire* (1993).

Davis, R. V. *A Brief Account of the Geology, History and Mechanisation of the Snailbeach Mine* (1967).

Hair, P. E. H. 'Industrial and domestic violence in Shropshire in the 1820s' in *Transactions of the Shropshire Archaeological Society* No.64 (1983).

Hazard, R. 'Metalliferous mining area of Shropshire' in *Proceedings of the British Speleological Association* No.2 (1964), pp.29-37.

Jones, K., M. Hunt, J. Malam and B. Trinder 'Holywell Lane: A squatter community in the Shropshire coalfield' in *Industrial Archaeology Review* Vol.6, No.3 (1982), pp.163-185.

Machin, R. 'Short list of the depths worked in the lead mines of Shropshire' in *Newsletter of the Hereford Caving Club* No.39 (1985), p.23.

Martell, H. M. & M. C. Gill 'Lead smelting in Welsh furnaces at Pontesford, Shropshire' in *Bulletin of the Peak District Mining History Society* Vol.11, No.6 (Winter 1992).

Pearce, A. J. 'Pre-Roman mining in Shropshire' in *Shropshire Caving and Mining Club Journal* (Summer 1991), pp.5-6.

Pearce, A. (ed.) *Mining in Shropshire* (1995).

Richards, L. 'Snailbeach Lead Mine reclamation and conservation' in *Earth Science Conservation*, No.3, 1992.

Shaw, M. *The lead, copper and barytes mines of Shropshire* (2009).

Trinder, B. *The industrial archaeology of Shropshire* (1996).

Turner, E. A. 'Lead Mining in Shropshire' in *Transactions of the Caradoc and Severn Valley Field Club* No.12 (1943), pp.44-53.

GENERAL PUBLICATIONS: LEAD MINING AND PROCESSING

Note: a useful bibliography on the English lead industry is available through the NAMHO website <http://www.vmine.net/namho-2010/RESEARCH/LEAD.pdf>

Palmer, M. & P. Neaverson 'The comparative archaeology of tin and lead dressing in Britain during the nineteenth century' in *Bulletin of the Peak District Mining History Society* (1989).

Palmer, M and P. Neaverson 'Nineteenth Century Tin and Lead Dressing: A Comparative Study of the Field Evidence' in *Industrial Archaeology Review* (1989) 12, 1, pp.20-39.

Percy, J. *Metallurgy, or the art of extracting metals from their ores, and adapting them to various purposes of manufacture* Vol. III, Lead, including extraction of silver from lead (1870).

Rees, A. 'Smelting' in *Rees's Manufacturing Industry (1819-20): Volume Five* pp.9-12.

Stratton, M. & B. Trinder *Industrial monuments in England: The lead industry* (1988/9).

Willies, L. 'Derbyshire lead smelting in the eighteenth and nineteenth centuries' in *Bulletin of the Peak District Mining History Society* Vol.11, No.1 (Summer 1990).

Willies, L. and D. Cranstone *Boles and smeltermills* Report of a seminar on the history and archaeology of lead smelting held at Reeth, Yorkshire, 15 -17 May 1992.

Useful websites

National Association of Mining History Organisations (NAMHO)

<http://www.vmine.net/namho-2010/>

The Mining History Network

http://projects.exeter.ac.uk/mhn/bib_CS.html

Mining and smelting non-ferrous metals

<http://www.igg.org.uk/gansg/12-linind/m-met.htm>

Peak District Mines History Society

<http://www.pdmhs.com/default.asp>

NATURAL ENVIRONMENT RESOURCES

Geology

Smith, B. & Dewey, H. *Special reports on the mineral resources of Great Britain. Vol.23. Lead and zinc ores in the Pre-Carboniferous rocks of West Shropshire and North Wales* (1986. Reprint of Geological Survey 1922 edition).

Toghill, P. *Geology of Shropshire* (1990/2006)

Biodiversity

Carter, A. *Shropshire inventory of ancient woodlands* (1988).

Graham, Dr S. *Snailbeach Mine SSSI: Geological documentation and management brief* (Natural England Earth Sciences) (1994).

Johnston, J. *Shropshire Biodiversity Action Plan* (2002).

Joy, Dr J. *The Lepidoptera of the South Shropshire Metal Mines and other areas in the vicinity: Interim Report II* (2000).

Turtle, Dr C. *Shropshire Wildlife Trust Dormouse Survey 1997* (1998).

Turtle, Dr C. *Shropshire Wildlife Trust Dormouse Survey additional sites* (1999).

Whild, S. 'The vegetation of the Shropshire Mines' in *Shropshire Botanical Society Newsletter* (2002).

Whild, S. & A. Lockton 'Species of conservation significance' in *Shropshire Botanical Society Newsletter* (Spring 2004).

BIBLIOGRAPHY

Brook, F. & M. Allbutt *The Shropshire Lead Mines* (1973).

Brown, I. J. *Historic industrial scenes: The mines of Shropshire* (1976).

Clark, K. *Informed Conservation* (2001).

Cranstone, D. / English Heritage Monuments Protection Programme: *The Lead Industry – Step 1 report* (1992).

English Heritage Monuments Protection Programme: *The Lead Industry – Step 3 report* (1992).

English Heritage *Conservation Principles Policies and Guidance, for the sustainable management of the historic environment* (2008).

GeoTech *Snailbeach Management Plan* (2006).

Heathcote, J. A. 'Account No.12: A survey of the metal mines of South West Shropshire' in *Shropshire Caving and Mining Club newsletter* June 1979.

Heritage Lottery Fund *Conservation management planning* (2008).

Lancaster University Archaeology Unit (Trueman, M. & Gill, M. C.) *Snailbeach Lead Mine Stage II Study - Archaeological Survey* 2 vols (1990).

Narrow Gauge & Industrial Modelling Review Issue 15.

Never on a Sunday: memories of the Stiperstones mining communities (2000).

Rieuwerts, J. *Lead mining in the Peak District* (2000).

Semple-Kerr, J. *The Conservation Plan* (1990).

Shaw, M. *The lead, copper and barytes mines of Shropshire* (2009).

Shropshire Mines Trust *Snailbeach Lead Mine Shropshire* (2008).

Shropshire Mines Trust *Snailbeach Mine: Miners Trail* (2011).

Tonks, E. S. *The Snailbeach District Railways* (1950/2007).

Webb, M. *Gone to Earth* (1917/2010).

Websites

English Heritage National Heritage List for England

<http://www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/>

Online database for the National Monuments Record of Wales (Coflein)

<http://www.coflein.gov.uk/>

Pastscape (English Heritage archaeological database) <http://www.pastscape.org.uk/>
Shropshire Council HER (on Heritage Gateway)
http://www.heritagegateway.org.uk/Gateway/Results_Application.aspx?resourceID=1015

Shropshire Archives catalogue
<http://www.shropshire.gov.uk/archives.nsf/open/29C4709D8A2905E1802575A1004CB0B6>

Natural England (specific information referenced in Section 2.4.2)
<http://www.naturalengland.org.uk/>

Snailbeach Lead Mine <http://shropshiremines.org.uk/snailbeach/index.htm>
...and specifically the Education Pack which includes information and historic maps
<http://shropshiremines.org.uk/educpack/index.htm>

Shropshire Mines Trust Ltd
<http://www.shropshiremines.org.uk/>

Darwin Country
<http://www.darwincountry.org/>

Secret Shropshire
<http://www.secretshropshire.org.uk/>

Gone to Earth (Powell & Pressburger fansite)
http://www.powell-pressburger.org/Images/50_GTE/index.html
...and related information on the filming of *Gone to Earth* in 1949-50
<http://www.powell-pressburger.org/Trips/Shropshire/index.html>

Grassington Cupola (Yorkshire Dales SMR)
<http://www.outofoblivion.org.uk/record.asp?id=201>