

## EXTRACT FROM ENGLISH HERITAGE'S RECORD OF SCHEDULED MONUMENTS

MONUMENT: Alport smelt mill

PARISH: HARTHILL

DISTRICT: DERBYSHIRE DALES

COUNTY: DERBYSHIRE

NATIONAL MONUMENT NO: 24977

NATIONAL GRID REFERENCE(S): SK22366486

### DESCRIPTION OF THE MONUMENT

Alport smelt mill lies in a steep wooded valley cut into the limestone plateau of Derbyshire, 500m north east of the village of Alport. It is a site relating to the local lead industry and was in use between 1845 and 1875. It includes the remains of reverberatory smelting furnaces and Spanish slag hearths (small blast furnaces for reprocessing the slags to extract more lead), together with a complex system of flues, condensers and chimney. The whole site was described in detail in 1870 as an example of contemporary best practice. The condensing system is particularly well preserved and retains residues important to the study of lead smelting, but the slag tips and some ruins of the smelt mill buildings also survive. These latter features lie on the flat valley floor, while the condensing system occupies the steep hillside to the south.

The smelt mill itself occupied the west end of the site, and is visible as slight masonry remains with associated earthwork platforms and a head-race running from the river; below ground remains of furnaces and Spanish slag hearths are likely to survive. To the north east, beside the river and east of an access bridge, a slag tip survives as an east-west earthwork 40m long and 10m wide. The remainder of the area is occupied by a very complex system of arched, lintelled and tunnelled flues zig-zagging along the hillside and communicating with several condensing chambers in varying states of survival. This system terminates at a large stubby chimney, on the hillside south east of the smelt mill site.

Excluded from the scheduling are the wooden hut and a stone hut beside the access bridge, although the ground beneath these features is included.

### ASSESSMENT OF IMPORTANCE

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.

Alport smelt mill is of importance primarily for its condensing system, which is considered to be the most complex example surviving in England, and is unusually well preserved. The importance of this system is enhanced by the survival of metallurgical residues adhering to the inside surfaces.

In addition, the slag tip is a well preserved example, affording opportunities for study of the metallurgy of 19th century lead smelting. The remains of the smelt mill itself, though not well preserved, are of importance because of their association with the condensing system and slag tip, and are expected to retain buried remains of furnaces and slag hearths.

The importance of the whole site is enhanced by its description in a contemporary textbook of metallurgy (Percy 1870) as an example of good practice. In particular, this source describes the operation of the condensing system in detail.

The site is of amenity value due to its location in a National Park.

MONUMENT INCLUDED IN THE SCHEDULE ON 05th September 1996