

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

MONUMENT: Marrick ore hearth lead smeltnill

PARISH: MARRICK

DISTRICT: RICHMONDSHIRE

COUNTY: NORTH YORKSHIRE

NATIONAL MONUMENT NO: 29006

NATIONAL GRID REFERENCE(S): SE07699947

### DESCRIPTION OF THE MONUMENT

The monument is situated on the south side of the road between Fremington and Maske, 1.25km north of Marrick. It includes the well-preserved standing remains of two lead ore hearth smeltnills and a pair of peat stores, together with a series of earthwork dams and the buried remains of a third smeltnill. The first smeltnill at Marrick was built by John Sayer in 1574-5. Built near the site of the later Low Mill and shown on a map of 1592 as New Mill, it is thought to have been the first in Swaledale, and one of the earliest nationally. By 1660 a second mill (High Mill) was built 50m uphill and to the west of the first. It is thought that Sayer's mill closed before 1705, but was not demolished as both mills are shown on the 1782 Marrick Estate map. Low Mill was extensively rebuilt in the 1830s by Jaques & Co, and renovated in 1862 by the Hurst Mining Company who installed a second-hand c.6m diameter waterwheel. High Mill had been declared beyond repair in 1861 and was incorporated into the flue system from Low Mill. Smelting finally ceased after the mines reverted to selling ore to independent smeltnills in 1868.

The monument includes the well preserved ruins of the 19th century Low Mill which measures c.9m by 13m north-south. This building, mainly standing to eaves height (the east gable being over 8m high), is divided into two main cells with a bellows hall to the west, and the smelting hall, which still retains a pair of intact furnace arches, to the east. Attached to the north wall are the ruined remains of the slag hearth building which measures c.5.5m by 7.5m, oriented at right angles to the main mill building. This contains the remains of the slag hearth including some iron fittings, which is thought to have been installed in the 1862 renovation. Immediately to the south of the bellows chamber are the ruined remains of the wheelpit which held the c.6m diameter waterwheel which powered the bellows. Extending a further c.10m southwards are the remains of walls of a set of three fuel stores with loading chutes to the west. Approximately 12m to the west of the slag hearth building are a pair of stone built bingsteads (storage bays for lead ore) with stone flagged floors. Stone footings of the original 16th century smeltnill have also been identified lying underneath the smeltnill complex.

The ruined remains of a double flue, c.3.5m wide, extends from the north west corner of the smeltnill, from the rear of the three hearths, c.50m westwards uphill to the High Mill. The upper portion of the flues are uncapped, but well preserved and pass through the centre of the mill's east

wall. It is thought that the High Mill was converted into a condensing chamber after it was declared unusable in 1861. Condensing chambers were used to slow the passing of fumes from the smelting hearths to allow lead vapours to precipitate out, allowing lead to be recovered for resmelting. After the Low Mill ceased operating, the flues were blocked with rough masonry where they pass through the east wall. It is thought that this event marked the reuse of the smeltmill for agricultural purposes. High Mill is believed to date to the 17th century. Like Low Mill it is also well preserved with a pair of intact furnace arches. Measuring c.14m by 9m north-south, it is divided into two main cells with a central chimney above the twin furnaces with the western part of the building originally containing the waterwheel and bellows. The chimney, which is square, stands to c.11m, 5m above the central gable. Built in at least three stages, the middle section of the chimney is constructed in brickwork.

To the south of the smeltmill flue, the rising land surface is revetted by a substantial stone wall to form a pair of roughly level areas. Approximately 120m to the west of High Mill are the standing remains of a pair of peat stores, in which peat was dried to fuel the smeltmills. The northern store is well preserved and measures 40 by 5.6m, oriented ENE-WSW. It is divided into eight bays by seven pairs of pillars set at 4.25m intervals. On both the north and south sides, the four end and two centre bays are linked by 0.6m thick walls to leave only bays three and six open. The store is roofless but the walls are complete to eaves level with the north pillars standing to 1.5m and the southern ones to 2.4m. A sheep dip has been let into the floor next to the centre section of the north wall. The second store, which is c.10m to the south, measures c.30m by 5m and retains gable ends standing to 3m and 4m, with the side walls standing to between 1.8m and 3m.

To the west of the peat stores is a series of three well-preserved dams which stand up to 1.2m high. Two of these dams, which regulated the flow of water to the waterwheels, have been identified on a 1782 map of the Bolton Estate.

All drystone field walls and modern fencing is excluded from the scheduling, but 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.

Ore hearth smelt mills were introduced in the 16th century and continued to develop until the late 19th century. They were the normal type of lead smelter until the 18th century, when they were partially replaced by the reverberatory smelt mill. The ore hearth itself consisted of a low open hearth, in which lead ore was mixed with fuel (initially dried wood, later a mixture of peat and coal). An air blast was supplied by bellows, normally operated by a waterwheel; more sophisticated arrangements were used at some 19th century sites. The slags from the ore hearth still contained some lead. This was extracted by resmelting the slags at a higher temperature using charcoal or (later) coke fuel, normally in a separate slag hearth. This was typically within the ore hearth smelt mill, though separate slag mills are known.

Early sites were typically small and simple buildings with one or two hearths, whereas late 18th and 19th century smelt mills were often large complexes containing several ore and slag hearths, 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. The ore hearth smelt mill site will also contain fuel stores and other ancillary buildings.

Ore hearth smelt mills have existed in and near all the lead mining fields of England, though late 18th and 19th century examples were virtually confined to the Pennines from Yorkshire northwards (and surviving evidence is strongly concentrated in North Yorkshire). It is believed that several hundred examples existed nationally. The sample identified as meriting protection includes: all sites with surviving evidence of hearths; sites with intact slag tips of importance for understanding the development of smelting technology; all 16th-17th century sites with appreciable standing structural remains; 16th-17th century sites with well preserved earthwork remains; and a more selective sample of 18th and 19th century sites to include the best surviving evidence for smelt mill structures, and flue/condenser/chimney systems.

Marrick High and Low Mills are very well-preserved and retain the best surviving hearths known nationally. The monument has a long history and displays a sequence of construction which illustrates the developing technology of ore hearth smelting mills. Complete with the remains of associated features (dams, fuel and ore stores), the monument is a fine example of a smelting complex. The survival of documentary information further enhances its importance.

#### SCHEDULING HISTORY

Monument included in the Schedule on 30th May 1979 as:

COUNTY/NUMBER: North Yorkshire 1226

NAME: Marrick Smelt Mill

The reference of this monument is now:

NATIONAL MONUMENT NUMBER: 29006

NAME: Marrick ore hearth lead smelting mill

SCHEDULING REVISED ON 08th December 1997