

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

MONUMENT: Sir Francis Level ore works, Gunnerside Gill, west of Winterings Pastures

PARISH: MELBECKS

DISTRICT: RICHMONDSHIRE

COUNTY: NORTH YORKSHIRE

NATIONAL MONUMENT NO: 29005

NATIONAL GRID REFERENCE(S): SD94039982  
SD94179965

### DESCRIPTION OF THE MONUMENT

The monument, which includes two areas of protection, is situated within the valley floor of Gunnerside Gill, 1.7km NNW of Gunnerside village, and is the southernmost part of a wider lead mining landscape, core areas of which are the subject of separate schedulings. The monument includes the standing and earthwork remains of two lead ore works together with the standing remains of a two storey mineshop (lodging for miners) and the adit entrance to Sir Francis Level with its associated iron air receiver (part of the equipment for compressed air rock drills). The monument also includes a number of deposits of both mining and dressing wastes.

Sir Francis Level and its associated pair of ore works represents the final phases of mining within the wider Gunnerside Gill landscape which has a long and well documented history. The mineral rights were owned by the Wharton family from 1544 (held by trustees from 1733), but passed to Anna-Maria Draycot in 1761 and in 1787 to a series of joint mineral lords known as the AD Lessors. The owners, who consisted of members of the Denys, Shuckburgh and Fermor families, followed a policy of splitting the mines into blocks to lease to venture capitalists, normally taking Gunnerside beck as one of the boundaries. Two smeltmills were built in Gunnerside Gill, the first in 1769 was just north of Botcher Gill Gate, of which little now survives; and Blakethwaite Mill, c.1820, of which significant remains survive and is the subject of a separate scheduling. The gill retains evidence of a range of mining techniques including scattered shafts, hushes and levels, the best preserved areas of which are also the subject of separate schedulings together with the best of the associated ore works. There was no use of steam power within Gunnerside Gill and a complex of dams, leats and other water management features were constructed to supply a range of waterpowered machinery both above and below ground. One reservoir and a pair of dams which are spatially distant from the main mining areas are also the subject of separate schedulings. In the mid-19th century the mines were becoming worked out to the level of the watertable. In 1864 Sir Francis Level was started nearly 1km to the south of the main mining area, this was designed to act as a drainage level as well as to test the lower rock strata for ore. Mining eventually ceased within Gunnerside Gill with the closure of Sir Francis in 1906. Sir Francis Level was driven close to the boundary between the mineral leases held by the Blakethwaite and Old Gang companies and was conducted as a joint

venture. The Blakethwaite Company gave up its lease in 1866 and was replaced by the AD Mining Company whose major share holder was the AD Lessor Sir George Denys. In 1870 hand boring was replaced by compressed air drilling with a water powered compressor being installed at the level mouth in 1869. In 1876 the AD Mining Company constructed an ore works on the west side of the beck, 250m downstream from the level, with a second built by the Old Gang company by 1878, a further 250m south on the east bank. Both companies ceased operations in 1887 to be replaced by the Old Gang Lead Mining Company in 1889 which took the leases for both sides of Gunnerside Beck.

At the north end of the monument lies the entrance to Sir Francis Level with its in situ tram rails. The original portal has collapsed, but the adit is still open and accessible. Immediately to the west are the ruined remains of the air compressor house built in 1869. This retains the 6.1m long by 1.1m diameter wrought iron air receiver together with timbers related to the waterwheel which are partly buried in the rubble. Tramway lines can be traced from the level entrance to a series of mine spoil heaps which extend as finger tips down the valley. To the west of these tips, 65m south of the level, there are the roofless remains of the mineshop which survives to a height of 6.1m. The building is 14.5m by 5.5m, twin bayed and two storey. It has fireplaces in the upper rooms only (access to which was by an external platform on the west side) and there is evidence of two free standing stoves in the larger, northern ground floor room. It is thought that the building acted both as miners' accommodation and as the mine office. The 2m high remains of a second, 9.0m x 5.5m twin bayed building survives 35m further south. This building is thought to have been the original mine office.

Remains of the western (AD Company) ore works stretch from 170m to 450m SSE of the level entrance, built on terraces just above the flood plain of the beck. At the north end there is a bank of nine bouse teams (storage bays for unprocessed ore) surviving as a 2m high rear retaining wall with footings of the side walls. Twenty five metres from the southern end of this bank there is the 3.3m high ruined remains of the wheelpit for the diameter c.6.7m diameter waterwheel which powered a crushing mill and classifier. The timbers belonging to the base of the crusher survives together with the stone built supports for the classifier (which sorted the crushed ore into different sizes). A second wheelpit for a c.9.3m diameter wheel lies 10m to the east of the first. It is much obscured by rubble and survives to 1.5m. This powered a number of jiggers (water filled wooden trunks in which sieves containing sized ore were shaken to separate clean ore from waste) the wooden bases of which are thought to survive within a level area immediately to the south. A photograph, c.1900, of this area of the ore works shows the wheels and the roofed but open sided building for the dressing floor. The two waterwheels were supplied by a pair of leats which extend down the west side of the valley, the upper of which also powered the wheel for the air compressor, whose tail race added to the discharge from the level to form the lower leat.

Between the main dressing floor a leat and pipeway can be traced to a pair of 15m by 15m terraced areas. These areas, the lower of which is revetted by a 0.75m wall, contain a number of slight earthworks which are thought to be the silted and buried remains of the three circular buddles that were installed in 1876, together with their associated settling tanks. The buddles consisted of a gently sloping cone, swept by up to four sets of brushes arranged radially and powered by a small waterwheel. Water containing fine particles entered at the centre and was allowed to flow to the circumference, the particles of lead settling first. The discharge water then entered large settling tanks in which the finest particles were collected.

On the east side of the beck are the well preserved standing remains of the ore works built by the Old Gang Company. These extend between 380m and 500m SSE of the Sir Francis Level entrance. At the northern end there are the near complete remains of a bank of 11 bouse teams which are typically round backed, forming 2.5m cubed bays. In front of these (to the south west) there is a

steep scree slope formed from hand picked waste, and 7m to the south west of the southern end of the bouse teams is a nearly complete wheelpit for a c.7m diameter waterwheel. This wheel drove a pair of roller crushers (one either side of the pit), the weights for which lie amongst spreads of fallen masonry. To the south and south east of the wheelpit there are a series of revetted areas and two barrow-dumped spoil heaps of dressing wastes. These wastes consist of both jiggling and buddling sized wastes, however it is thought that these were produced by manually operated hotching and dolly tubs respectively, and not by waterpowered devices like those employed by the AD Company. Timber from these devices can be seen buried in the waste heaps. At the north end of the bouse teams, incorporated into the alignments of drystone field walls, there is the roofless but otherwise nearly complete stone built structure of a single roomed building. This building, which is included in the scheduling, has no fire place and is thought to have been a storeroom. Water for the wheelpit was supplied by a wooden launder carried on stone pillars across the beck from the tail race of the AD Company waterwheels. Tumbled remains of these pillars, which lie below the tramway line leading northwards to Sir Francis Level, extend beyond the scheduled area. All modern fencing, and drystone field walls, are excluded from the scheduling, 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 ore works were an essential part of a lead mining site, where the mixture of ore and waste rock extracted from the ground were 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 size (either by manual hammering or by mechanical crushing); sorting of broken material by size; separation of gravel sized material by shaking on a sieve in a tub of water ('jiggling'); and separation of finer material by washing away the lighter waste in a current of water ('buddling').

The field remains of ore works 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.

Simple ore dressing devices had been developed by the 16th century, but the large majority of separate ore works sites date from the 18th and 19th centuries, during which period the technology used evolved rapidly.

Ore works represent an essential stage in the production of metallic lead, an industry in which Britain was a world leader in the 18th and 19th centuries. Sites are common in all lead mining areas and a sample of the best preserved sites (covering the regional, chronological, and typological variety of the class) will merit protection.

The whole of Gunnerside Gill is a well preserved lead mining landscape, containing a wide range of features and areas. It is well documented historically from the 17th century onwards and a phased programme of archaeological survey has contributed to the understanding of the remains. The gill is accessible to the public and the archaeological remains form an important educational resource and public amenity.

The market in lead during the latter 19th century was depressed by cheap foreign imports. Sir Francis Level, with its pair of ore works, retains well preserved remains exemplifying two contrasting, but typical strategies pursued in the face of falling lead prices. The AD Company invested in a highly mechanised ore works and introduced the new technology of compressed air drilling, whereas the more conservative Old Gang Company relied upon more traditional manual dressing techniques. The air receiver, with the ruins of the compressor house, is the earliest in situ remains of compressed air technology known in the country outside Cornwall (where the technology was developed). The AD Company ore works on the west bank retains important standing and stratigraphic remains of a mechanised dressing floor. The area originally housing the jiggers has been affected by stream erosion, but still retains important in situ remains. The buddling area is thought to be nearly complete and partly sealed under hill-wash. The eastern ore works built by the Old Gang Company is particularly well preserved with a very fine set of bouse teams, wheelpit and waste heaps. Timber remains partly sealed in the waste indicate good stratigraphic survival of the remains of ore dressing features. Together with the mineshop, footings of other smaller buildings, the networks of leats and tramways, the whole monument exemplifies the highly organised nature of late 19th century lead mining and ore dressing complexes.

MONUMENT INCLUDED IN THE SCHEDULE ON 03rd July 1997