

EXTRACT FROM ENGLISH HERITAGE'S RECORD OF SCHEDULED MONUMENTS

MONUMENT: Copper mines on Ecton Hill

PARISH: WETTON

DISTRICT: STAFFORDSHIRE MOORLANDS

COUNTY: STAFFORDSHIRE

NATIONAL MONUMENT NO: 28883

NATIONAL GRID REFERENCE(S): SK10025864
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DESCRIPTION OF THE MONUMENT

The monument includes the known surviving extent of the standing and buried remains of Deep Shaft, Dutchman Mine and the Ecton dressing floors. These were an integral part of the copper and lead mines on Ecton Hill, which, in turn, were the last of the north Staffordshire mines to close. Ecton Hill is bounded on the west by the River Manifold and on the east by a wide shallow valley containing two streams. The remains lie within four separate areas of protection. The rest of the site is not yet fully understood and therefore not included in the scheduling.

There are about 70 mine workings scattered over the hill, including 40-50 vertical shafts, some over 90m deep, others shallow or grassed over. The chief Ecton mines were: Deep Shaft, Clayton, Dutchman, Bag Mine, Chadwick and Waterbank. In addition there were the associated sites of the Ecton Hill smelting works and dressing floors on the west side of the hill. Of these the dressing floors, Deep Shaft and Dutchman Mine have been included in the scheduling.

Deep Shaft sits on the centre of the northern part of Ecton Hill in the first area of protection, with Dutchmans level about 150m to the south, and the dressing floor down the hillside about 150m to the west of Dutchmans. The remains of spoil tips can be seen to the west of Dutchmans, and downslope of the dressing floor.

The position of the main ore body, the Ecton Pipe, is marked on the hilltop by the former engine house which was later used as a barn. It is here that the main engine shaft, or Deep Shaft, goes down nearly to the base of the mine. When it was realised that horse gins could no longer cope with the large quantity of material being raised from what was then the deepest mine in Britain, a steam powered Boulton and Watt winding engine was housed in the engine house in 1788. Inside the building there is a slot for the beam in the centre of the wall, and access for the pipe from the boiler can be seen. Original timber lintels are present in the building, and the wheel pit survives, though its northern end is partially infilled. After a number of repairs to the engine it was finally scrapped in 1855. Both kibbles (buckets),

the balance weight as well as the water pump rods, were originally located in the Deep Shaft but, following an accident when the balance weight dropped down the shaft, a separate shaft was constructed for the balance. This shaft is still visible today with a large built up mound to bring it level with the winding gear, and is now capped by a substantial stone 'beehive'. Adjacent to the engine house are the ruins of its chimney standing about 3m high and lined with brick and masonry. The engine shaft is located immediately to the north west of the building. Spoil immediately outside the engine house is thought to mark the site of the winding drum of the engine, and it is believed that the base of the drum survives under the mound.

Dutchman's Level in the second area of protection includes an adit entrance and the remains of three buildings covering an area of about 80 sq m. At the north east corner of this mine site are the ruins of a two-bay building which cuts into the hillside, thought to be a smithy and carpenter's shop. Only the foundations of the southern bay survive, although the other bay is more complete. Immediately to the south of this building is the adit entrance, which has been carved out of natural bedrock. Several timber lintels survive at the entrance. A later entrance with a locked gate has been added inside the original entrance for security reasons. At the southern end of this site are the ruins of what are considered to be the engine house and a stone mounting block with what is thought to be a wheel pit adjacent to it. At its highest point the standing remains of the engine house are about 2.5m high. Immediately to the north of this is a levelled area which is believed to be the site of a dressing floor, and beyond this a large area of spoil.

Lying within the third and fourth areas of protection are the Deep Ecton and Clayton Portals as well as Ecton's upper dressing floors dating from the 19th century. They cover a large oblong area on the west side of Ecton Hill. The 19th century dressing floors replaced those of the 1760s at the foot of the hill between the river and road. A number of features associated with the processing of ore survive including two rotary buddles, an ore shoot and the site of the jig tubs. When the ore had been washed and crushed, it was sieved in the jiggers so that the heavy ore settled onto or through the jiggers, leaving the waste to be skimmed off. The round buddles, which are 3m in diameter and 0.3m deep, were purchased in 1885 by the Ecton Co Ltd. They had rotating brushes which agitated the sand-size products of earlier crushing and stamping mills, so that the finely ground ore settled in the water filled tanks. One of the buddles and the ore shoot have been partially excavated, leaving timber exposed. The site of the jig tubs are located to the east of the buddles, and also present is the line of the water course which provided water for processing. The line of the tramway from Salts Level to the area of the buddles and jig tubs can be traced from old plans as can the site of the engine house. The line of the double track incline from the engine house can be determined, although nothing is left of the supports of the incline itself. Adjacent to the engine house was a single storey workshed which has now been removed to nearby West Side Mill where it is still in use.

A number of original mining features can still be seen today lying further down the western side of the hill towards Ecton. The area below Dutchman where a path leads to the Castle Folly, includes a building which dates to the 1930s and has in its private grounds the blocked entrance to Salt's Level from where ore was trammed onto the dressing floor, at a time when the Boulton & Watt engine was in use. Descending from here one passes the former office, salesroom and home of the manager, all now private residences. These features are not included in the scheduling.

The first mention of minerals at Ecton is in 1376, and by 1575 the land was owned by the Cavandish family (later Earls and then Dukes of Devonshire) and the Burgoyne family who held lands at Ecton in the 16th century. Large scale

mining started in the 17th century, when Ecton became one of the very few British copper mines. It achieved greater fame by becoming the first British mine to use gunpowder for mining purposes. In 1660 at the end of the Civil War, the mines were reopened by the 3rd Earl of Devonshire, and were worked continuously for the next five years. Traditionally these early operations took place at the Dutchman Mine. From 1723 to 1760 the 3rd and 4th Dukes of Devonshire leased out the mine to various ventures, and it was during this time that Apes Tor Sough was completed to intersect the Ecton pipe. This remained the only level access for 15 years, but the steep hillside here close to the river gave little room for buildings, dressing floors and smelting furnaces, so a new drainage level, Deep Level, was constructed. The years between 1760 and 1818 were the start of a period of great expansion and prosperity for the mines. Drainage was a slight problem at Ecton, but was solved by the installation of a pumping engine operated by a balance beam. By 1786 ore production was at its peak, with over 4,000 tons being raised in that year alone. By the time the steam engine was installed in 1788, production had passed its peak with output falling sharply.

In autumn 1804 a new level, later known as Salts Level, was driven to intersect Deep Shaft so that ore could be trammed out to new dressing floors. It is not known why the new dressing floors were constructed at this time when the main body of copper ore was almost exhausted. The Duke of Devonshire finally ceased operating Ecton Mine at the end of 1825, although mining at Ecton continued under management of a private company. Further mining took place at Ecton on a fairly sporadic basis.

In 1883 The Ecton Co Ltd undertook some work on the buildings at Ecton, including converting the South Smelt House to smiths and carpenters' shops and a changing room. In the following year extraction of ore from Clayton and Waterbank Mines necessitated the purchase of dressing plant, a complete Cornish crushing mill, jigger and two buddles with attachments were purchased. Erection of the plant commenced in March 1885 with the building of a trestled incline, carrying a twin railed track, from Clayton entrance, over the Dukes Gravel Pit to the engine house so that the ore could be loaded into wagons in the stopes, taken up the shaft, up the incline and onto the dressing floors without being loaded and unloaded several times.

The Ecton Company terminated its lease on 1st Jan 1891. Ecton was the last of the north Staffordshire copper and lead mines to close, unable to compete with the developing orefields overseas.

All wire fences and sleepers are excluded from the scheduling, although the ground beneath them is included.

ASSESSMENT OF IMPORTANCE

Copper was extracted in Britain intermittently from the Early Bronze Age (about 2000 BC) until the early 20th century, after when the industry was confined to by-product production and small scale reworkings of mines and dumps. There is very limited evidence for copper mining before the 15th and 16th centuries, and most known sites are of later date, principally of the industry's 18th and 19th century peak after it had been revitalised by developments in smelting technology. In the 18th and 19th centuries, as perhaps it had also been in prehistory, British production was important on a European scale.

Nucleated copper mines are a prominent type of field monument produced by copper 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 and power transmission features such as wheel pits and leats. The majority of nucleated copper mines are of 18th to 20th century date, earlier mining being normally by rakes, opencuts and open levels, and including scattered ore dressing features.

An essential part of a copper mining site is the 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 can be summarised as: picking out clean lumps of ore and waste; hammering (breaking down lumps to a smaller size by manual hammering or by mechanical crushing); jigging (separation of gravel-sized material by shaking on a sieve in a tub of water; and buddling (separation of finer material by washing away the lighter waste in a current of water). Field remains of ore works include crushing devices, separating structures and tanks and tips of distinctive waste from the various processes, together with associated water supplies. Simple ore dressing devices had been developed by the 16th century, but the large majority date from the 18th to 20th centuries, when technology evolved rapidly.

During English Heritage's national evaluation of the copper industry, 130 sites were assessed. This is a highly select sample of the numbers of sites that historically existed in England; although there are no national estimates, for the south west alone an estimate has been made of over 10,000 sites. It is considered that protection by scheduling is appropriate for less than 50, with alternative means of protection or management being considered more appropriate for the other nationally important sites.

The Ecton mines of Deep Shaft and Dutchman survive well, retaining most of the features and layout which were present at their closure in the mid 19th century, unencumbered by later redevelopment or dumping. The dressing floor is similarly undisturbed. There are a number of important survivals, in particular, the Boulton and Watt engine house at Deep Shaft and the fragile wooden buddles and ore shaft at the dressing floor. The presence of the elements of mining and processing can be traced in the survival of mines and dressing floor, including the route of the water supply used in processing of the ore.

Ecton is almost unique locally in being a rich copper mine on the western edge of the Peak District, an area usually associated with lead mines. The Ecton mines made a significant contribution to the national production of minerals, being innovators, or at least early users, of several new techniques later to become widespread throughout the industry. Most notably they pioneered the use of explosives in mining for the first time in Britain, and the use of a balance-beam hydraulic pumping engine for drainage, which was probably the largest of its type ever built. The mines also used underground boats soon after they were first used at the Worsley Collieries near Manchester, and were one of the earliest users of James Watt's rotative steam engines for raising ore from the base of the mine shaft.

The good survival of the mines on the hill top and the dressing floor on the hillside provide a highly visible and tangible reminder of the scale of the 19th century mining boom and its influence to the present day on settlement patterns, accounting for the substantial expansion, and in some cases the foundation, of most of the hamlets and villages in the surrounding area.

MONUMENT INCLUDED IN THE SCHEDULE ON 08th March 2004