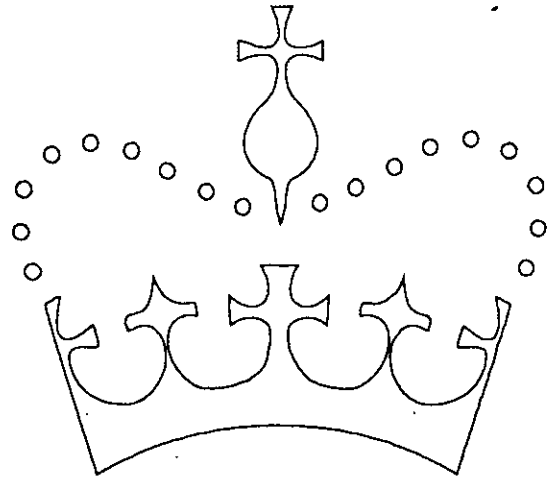
RCHME SURVEY REPORT



# AUSEWELL WOOD ORE PROCESSING AND SMELTING COMPLEX, ASHBURTON, DEVON

An archaeological survey by the Royal Commission on the Historical Monuments of England

*December 1998*

ROYAL COMMISSION ON THE HISTORICAL MONUMENTS OF ENGLAND

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| County: | Devon |
| District: | Teignbridge |
| Parish: | Ashburton |
| OS Map No: | SX 7271 |
| NGR: | SX 7270 7140 |
| NMR No: | SX 77 SW52 |

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|---|---|
| Surveyed: | October-November 1998 |
| Report by: | Phil Newman |
| Investigation: | P. Newman, M. Fletcher |
| Illustrations: | P. Newman |



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## CONTENTS

*Summary*

*An ore processing site at Ausewell Wood was surveyed by the Royal Commission on the Historical Monuments of England(RCHME) during October 1998 at the request of the Dartmoor National Park Authority(DNPA), to establish the extent of the remains and to aid interpretation with a view to future management of the site. Long recognised for the importance of the iron smelting evidence, which may date from the 16th-century, the site also contains evidence of later processing activity from nearby copper and, possibly, tin working The survey has contributed substantially to the understanding of both sets of remains, as well providing a detailed plan of the whole complex and helping identify some future research priorities*


***Fig. 1. Dartmoor National Park, showing location of Ausewell Wood.***

**INTRODUCTION**

*Documentary Evidence and previous archaeological work*

The existence of an iron smelting site at Ausewell Woods was first brought to the attention of archaeologists by Amery in 1924, when, in his Presidential Address to the Devonshire Association, he described the remains of a furnace sited near the River Dart. This he correlated with a map of 1605 upon which the site of an iron mill was depicted (Amery 1924). He also identified the mounds of slag at the site which, when analysed, proved to be iron slag. Some aspects of the site are likely to have been well known prior to Amery's paper however, as the 1st edition OS 1:2500 scale map of the area (Sheet CXIV.2) depicts much of the large leat which ran through the site and is still visible today. Subsequent writers, (including R.H.

Worth) have considered the furnace and the slag but have paid little attention to the other features and, more important, the mining context of the furnace and the ore source.

The most useful contribution to the study of this site to date is David Crombie's undergraduate dissertation (Crombie 1982), which included documentary research and a field survey, with detailed analysis and an evaluation of the site's place within early iron smelting generally. Many of Crombie's conclusions regarding the iron smelting are still valid today, although again he did not consider the site as part of a wider mining complex, probably due to the limitations of his brief.

Known documentation for Ausewell has recently been collated and summarised by Mike Brown (1997). This work revealed the paucity of relevant documentation prior to the 1605 map and that the site is poorly recorded subsequently, only fragmentary and often confusing material surviving, with a total dearth of references to smelting. However, Brown has introduced documentary elements relating to the extractive activities in Ausewell Wood, which had not previously been considered in detail. In particular it is clear from more recent documentation from the 18th and 19th centuries, that the nearest source of ore, at Cleft Rock lode, located on the slopes of Ausewell Wood, may have been capable of producing tin, copper and iron. Also, there are references on a lease of 1791 to stamping mills and other ore dressing processes as well as the mention of digging for tin, copper, lead and other metals (Brown 1997, 4). Further references to tin extraction at 'the myn ay Hzwell Hazwood' occur in the 1830s (Brown 1997, 7). Not only are the working of tin lodes specifically mentioned but also 'stremen pits' which may refer to streamworks in the vicinity, though none have yet been identified.

The disused workings at Cleft Rock are also labelled as tin mines on the OS 2nd edition 1:2500 scale map of 1904. It is interesting to note however that on Donne's map of 1765, which was surveyed at a time closer to the mines being worked, 'Hazel Mine' is considered to be a copper mine (Donne 1765), a point reinforced by the depiction of a copper lode on the British Geological Survey map (BGS) sheet 338, 1995. Hamilton Jenkin, citing Kahlmeter, an observer of 1725, also mentions production of copper here with some 170 tons of ore being shipped to smelting works in South Wales. Under the terms of the lease, the company was apparently obliged to employ 100 people at the site for the first three years (Hamilton Jenkin 1981).

## GEOLOGY AND MINERALISATION: THE ORE SOURCE

Ausewell Wood is sited wholly within the Dartmoor Metamorphic Aureole. The majority of the area lies on the Upper Carboniferous Crackington Formation, though the border between this and the Upper Devonian Kate Brook Slate Formation partially transects the east of the area. The only metalliferous lode to be marked on the BGS map is that of copper(Cu), though a tin(Sn) lode is present on the western side of the River Dart at Holne Chase.

## SITE DESCRIPTION

*General context, tracks, access*

Ausewell Wood occupies a steeply sloping, tract of land on the east side of the River Dart, between Holne Bridge and New Bridge. This section of the River Dart is characterized by a steep, heavily-wooded valley, rising over 800m on the east, Ausewell, side to 1040m above

OD and on the west, Holne Chase side, to 625m above OD. The west-facing slopes of Ausewell Wood contain some dramatic geological features including a vertical outcrop at Raven Rock with massive associated scree running from the rocks down to the edge of the river floodplain. A little further to the east, the summit of the slopes is crowned by a further outcrop at Ausewell Rocks. To the south, Cleft Rock, also originally a small outcrop, forms a high, rocky knoll overlooking an eastward bend in the River Dart.

On the west side of the river lies Holne Chase; a large, north-facing spur of land formed by a sharp curve in the River Dart. The Chase is surmounted by a prehistoric earthwork of probable Iron Age date (Riley 1995, 91-5). Holne Chase has also been long associated with metal mining including tin and iron. Iron Age currency bars were discovered here in the late 19th century (Amery 1873).

The main evidence of mining activity on the Ausewell side of the valley is at the so-called Cleft Rock at SX 7269 7090. This comprises an impressive rock-cut open gunnis, with many associated shafts and several adits opening on to the west-facing slope. Two ruined buildings are also visible at the site. A smaller openwork, along with shafts and prospecting pits is located to the north of Cleft Rock. All this evidence of extraction has never been surveyed, much of the detail being omitted by the OS. Some of the evidence lies within impenetrable conifers and the full extent will not be appreciated until a detailed survey is conducted.

Reconnaissance of the lower slopes, as part of the RCHME survey has also revealed the existence of several charcoal burning platforms and others should come to light on further investigation. It is tempting to link these with the iron smelting episode at Ausewell, though the possibility of supplies to other local users of charcoal has to be considered. No evidence of coppicing or other aspects of former woodland management appear to have survived, probably due to the use of the area for intensive conifer plantation since the 1940s.

Access to the site is, and probably always was, by a track from Holne Bridge, which is marked on the OS 1st edition map and all subsequent editions. Although now adopted by the forestry industry, the track was originally constructed to allow transport of ore from the Cleft Rock down to the processing site and thence to the main road at Holne Bridge. Sections of the track, high above the river have been hewn from the solid rock to form a narrow ledge along the slope. The extension up to the mine is still in place. It has a sharp hairpin at one point so that wheeled vehicles and horses could negotiate the gradient and terminates near some shafts at SX 7275 7100

The smelting works and other ore processing features are located on a narrow strip of alluvium adjacent to the River Dart, 600m long by a maximum of 60m in width, centred SX 7270 7140.

**FIELD EVIDENCE**

(letters in brackets refer to features on the main plan Figs 2,5 & 6)

*Smelting*

Identification of the site or part of it as an iron smelting works, relies mainly on the existence of two heaps of iron slag.

**Slag heap 1 (SH1), centred SX 7271 7148**

This heap appears to consist exclusively of iron bloomery slags, including both furnace and tap slags. It is sited to the south of a large artificial channel(AC1) and is not so much a heap as a spread and the vegetation prevents quantification of its full extent from earthwork evidence alone. Fragments of the slag are also visible on the north side of the channel, though their deposition may be secondary. Two modern vehicle tracks cut through the heap making an evaluation of the dumping regime difficult. Fragments of a wall which indicate the possibility of a structure (B7) are visible on the north-west corner of the heap at SX 7271 7149. The remains are almost totally covered with loam and insufficient masonry is visible to determine if this is a building.

**Slag heap 2 (SH2), centred SX 7268 7119**

Sited near the southern extremity of the site, slightly south-west of the furnace, this substantial mound, standing to height of approximately 3m in places appears to consist exclusively of blast furnace slags. The slag is of a glassy character, varying in colour including greens and blues. Analysis instigated both by Amery (1928) and Crombie (1992) have concluded that this is almost certainly iron slag, though detailed analysis using modern techniques and a more rigorous sampling method is yet to be carried out.

The morphology of the heap demonstrates that the material was dumped approximately from north-east to south-west, placing its source to the north-east. This is consistent with the position of the known furnace (BF).

The northern edge of the heap has been cut through by a channel which consists of a wheelpit and tailrace (DF1), from a later episode. The northernmost edge of the original heap is now isolated along the edge of the channel and consists of a low mound of slag.

Other fragments of blast furnace slag are scattered elsewhere over the site, particularly near the dressing floor wheelpit (DF2) and a small amount near (DF3).

**Iron smelting mill and blast furnace (BF), SX 7270 7120**

The iron smelting mill consists of a totally ruined and badly disturbed structure, its function being identifiable only by the walls of the blast furnace which are extant. This was excavated by Amery earlier this century (Amery 1924). The west and south walls of the furnace building remain visible though the latter has a suspiciously level top surface and may have been remodelled as a launder when the dressing floor wheelpit (DF1) was installed at a later date. To the east of the furnace is a large hollow, which probably is not an original feature. The location of the entrance and wheelpit, if it had one, together with the former location of the bellows, are not apparent and there are no further clues as to layout.

The furnace itself survives as two slightly concave sides made from substantial rocks, spaced 0.7m apart on the north and south sides, visible to a height of 1.5m. The rocks show clear evidence of heat damage and several further large fragments lie in the base of the furnace. Small pieces of lute are also visible around the area of the furnace. Amery's published plan shows an intact circular crucible, positioned between two walls. A trench, presumably a result of Amery's excavation, enters the crucible on one side. However, his accompanying drawing is not oriented so it now not possible to deduce which side this trench lay.

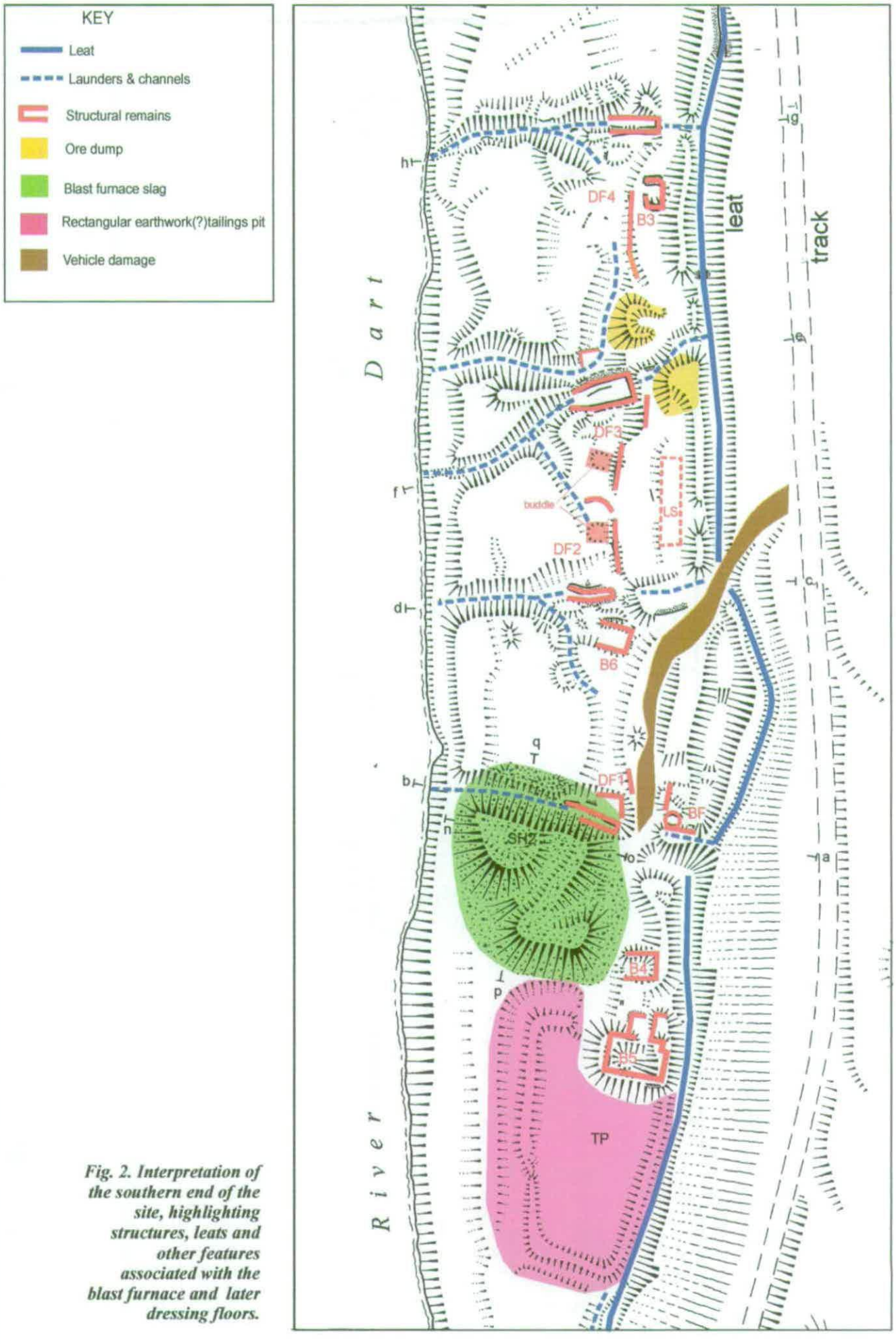


*Fig. 2. Interpretation of the southern end of the site, highlighting structures, leats and other features associated with the blast furnace and later dressing floors.*

*Wheelpits and dressing floors*

To the north and north-west of the iron smelting mill is a range of four wheelpits with other associated structural remains, including level terraces with retaining walls to one or both sides of each wheelpit. All four are oriented east to west with tailraces so positioned to conduct water back into the River Dart. They are equally spaced with approximately 30m between the wheelpits. Water to all four was fed from the substantial leat which runs the full length of the site(see L1 below). Each would require a short wooden launder to divert water

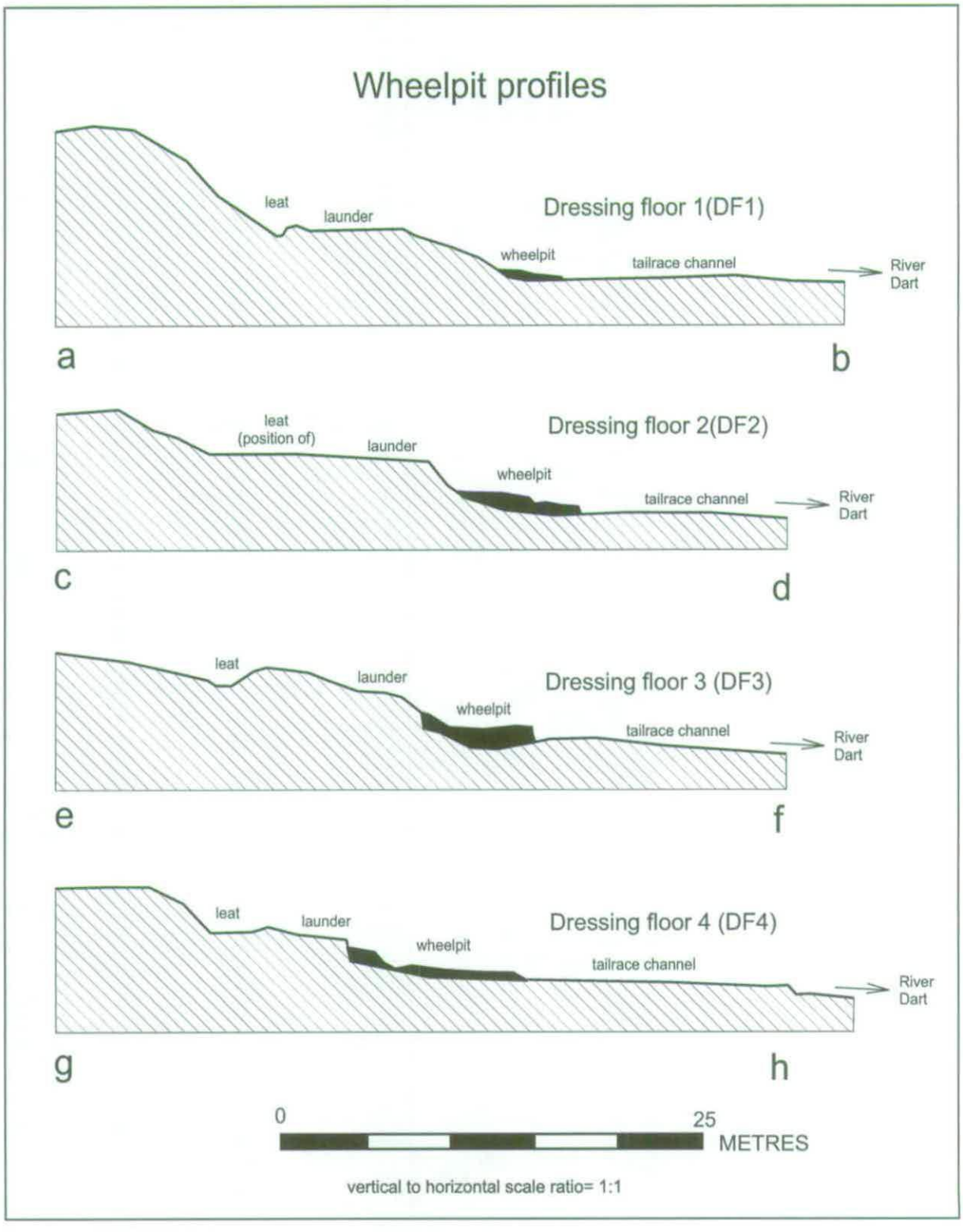


***Fig. 3 Profiles of the four wheelpits, showing sructure(black), leats, launders and tailrace***

through 90° onto the overshot wheels. The wheels almost certainly powered crushing equipment in the form of stamps which were located to either side of the wheelpits. These stamps were associated with a later phase of activity at the site when copper and, just possibly, tin were mined beneath Ausewell Woods. The layout, which includes two probable buddles, where finely crushed ore was refined in water, closely resembles tin dressing floors found elsewhere on Dartmoor, usually having a date range from the mid-18th century to the early 20th century (Newman 1998, 58). Such evidence is not common at copper mines on Dartmoor, though in Cornwall, William Pryce describes the use of dressing floors and stamping mills for processing lower grades of copper ore (Pryce 1778). Many Cornish mines exploited copper and tin and although copper ore usually needed less intensive processing, the harder ores were often processed using stamps and buddles as for tin. There is documentary evidence for copper being worked and processed at Ausewell 1725 (Hamilton Jenkin ) and in 1791 the site was leased for the exploitation of copper and tin, when the construction of stamping mills 'in the same Place and Places as have been done heretofore' (Brown, 1997) was clearly described.

**Dressing floor 1 (DF1), SX 7269 7120**

This dressing floor lies just to the west of the iron furnace and its construction probably disturbed the iron furnace building, when its south wall was remodelled to serve as a leat embankment, at right angles to the leat. Interestingly this 90° kink in the leat is depicted on the early OS maps in precisely this position (OS 1:2500 scale, 1884). The wheelpit was approximately 5m long by 1m wide and masonry from the walls survives on the north side and in patches on the south side. The tail race consists of a 'V'-shaped gully which conducted water directly back into the river. Both the wheelpit and the tailrace have cut through the edge of the earlier heap of blast furnace slag (SH2). A level stance on the north side of the wheelpit, measuring approximately 3.2m by 4.2m, has vestiges of a masonry revetment along two sides, and a low internal foundation wall. This is likely to be the position of machinery associated with the wheel, almost certainly a stamping mill. North of this is a level area with traces of a retaining wall on the east; additional dressing apparatus could have been housed here.

**Dressing floor 2 (DF2), SX 7269 7123**

Both sides of this wheelpit survive and it has internal dimensions of 6.7m by 0.9m. Where the wheelpit meets the tailrace the structure kinks slightly suggesting it may have been built into an existing channel, or that the wheelpit was modified at some point. A substantial, flat-topped leat embankment with partial stone edging stands immediately east of the wheelpit which would have connected to the leat just beyond. Adjacent to the south side of the wheelpit are remains of a probable rectangular building(B6). Three walls are visible, all ruined to just above foundation level. The internal dimensions would have been approximately 3m by 2.5m. To the north of the wheelpit is a level terrace with a retaining wall on the eastern side. The wall curves around to the west at ground level, probably defining the outline of the dressing floor. Set on the level terrace is a shallow depression of approximately 2.5m by 2.5m which is likely to be the outline of a buddle.

A level stance (LS) with vestiges of a low stone revetment on the west side is the possible site of a temporary timber building. It is approximately 15m long by 3m and is sited between (DF2) and (DF3), just west of the leat, above the dressing floor.

**Dressing floor 3 (DF3), SX 7269 7125**

The third dressing floor lies immediately north of (DF2). All three sides of the wheelpit walling survive and the dimensions of the pit are 8m by 2.5m, tapering to 1.5m at the western end. This would apparently have housed an extremely wide waterwheel with a breast of approximately 2m, far larger than any other late 18th-century Dartmoor mines, so far recorded. A lengthways internal division in the wheelpit alternatively suggest that either the wheelpit housed two wheels, for which there is no known precedent on Dartmoor, or that it was modified at some point to house a smaller wheel. Adjacent to the south side of the wheelpit is a shallow hollow, which could have housed the stamps pit and a level terrace with rear retaining wall, similar to and adjoining that of (DF2), also contains a shallow depression which is also likely to be a buddle. To the north of the wheelpit is a rectangular, stone-lined depression which is probably another settling pit or buddle. Nearby is a mound of rubble which appears to be mined stone, containing quartz and other gangue material but it includes some copperous rocks also. This heap could be either very low grade ore awaiting processing, or it had already been rejected before processing. A mound of similar material lies immediately east of the wheelpit. This has a level top surface which adjoins the bank of the leat to the rear of the stamps pit.

**Dressing floor 4 (DF4), SX 7270 7129**

The northernmost dressing floor wheelpit has stone walling surviving on its south side only. The north side has been breached for drainage purposes at a later date and no stone is now visible in place. The wheelpit has internal dimension of approximately 6m by 1m. Adjacent to the south side of the wheelpit is a shallow depression, with vestiges of a masonry lining. This seems likely to have been the stamps pit. South of this is a level terrace and retaining wall upon which is a semi-circular arrangement of earthfast boulders, with a diameter of 3m. This may be the base or outline of some item of processing apparatus, or settling equipment. Standing above to the east of the dressing floor is a small shelter type building (see B3 below).

It is notable that for each dressing floor, in addition to the tailrace outflow from the waterwheel, each of the floors themselves have outflow channels, giving weight to the suggestion that buddles and/or other such settling apparatus using water, were in use here. From (DF1) a channel leads north into the tailrace of (DF2) and a channel from (DF2) leads north into the tailrace of (DF3).The floors associated with (DF3) used its own tailrace and a channel from (DF4) runs south into a broad channel which turns into the river just north of (DF3).

*The leats*

**The main leat (L1)**

Water to power all later waterwheels and processing operations was supplied by a single leat which drew from the River Dart to the north of the site. The headweir was probably sited just downstream of the prominent bend in the River Dart at SX 7285 7178 where a natural channel runs off the east side of the river forming an island of c.160m long. Although no distinct remains of the leat channel survive further north than the southern tip of the island, there is a definite level step running along the foot of the slope adjacent to the channel, which meets the leat proper at the correct level just south of the island at SX 7278 7162

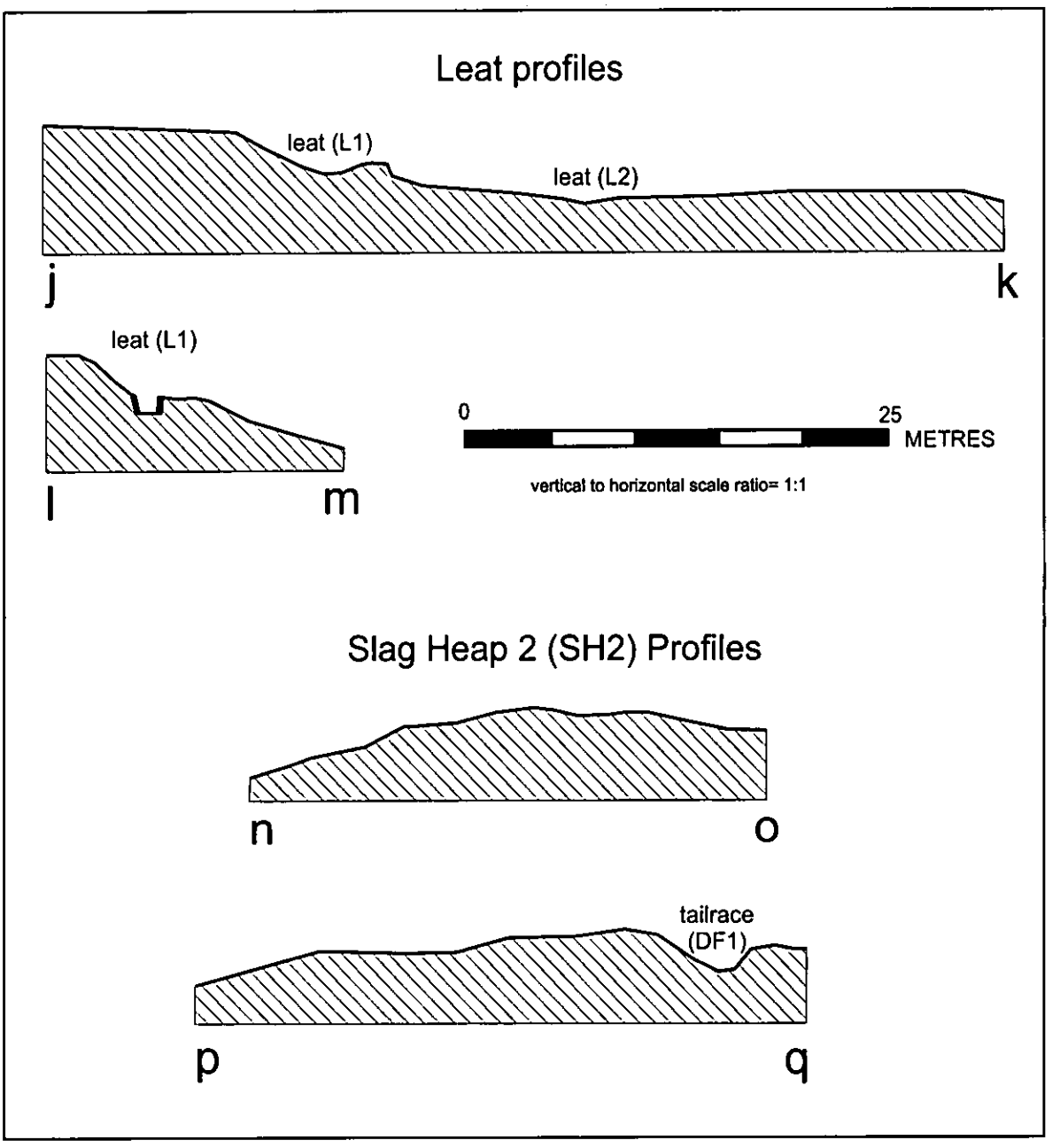


*Fig. 4. Profiles of the main leat (L1) and the blast furnace slag heap (SH1).*

The leat itself forms an artery running the entire length of the site and beyond, where the base of the slope meets the level plane on which the mills are located. It is quite massive in comparison with leats serving similar purposes at other small mines and processing sites on Dartmoor, and clearly also served as a reservoir, probably to regulate the flow of water from the copious though unpredictable River Dart. It would also have allowed more than one wheel to be supplied at one time as the flatness of the site prevented water from one wheel being reused on others, as was common practice at sloping sites, such as Eylesbarrow Mine in the Plym Valley. Although now filled with forest floor debris and loam, the channel still survives to a depth of 1m in places and the retaining bank is up to 6m thick. Substantial stretches of the bank are reinforced with a stone revetment, both on the interior and exterior and at least two points the channel has masonry lining on both interior sides, suggesting the positions of a bridge.

Where the leat transects the wide artificial channel(AC1) at SX 7272 7150 a stone wall, some 1.5m thick has been constructed to retain the water along this stretch for about 6m. The channel is likely therefore to predate the leat. However, where the leat meets the south side of the channel, beyond a natural mound which divides the channel in two, the wall curves inwards and is then breached for approximately 3m, suggesting that water was diverted into the channel for some reason. This seems likely to have been the position of a sluice for regulating the flow of water by conducting it into this channel which was probably by then disused, keeping surplus water away from the working area to the south.

It is tempting to believe this very large leat would have been constructed in its present form to serve the four wheelpits during the later period of activity at Ausewell. However, a substantial watercourse is clearly drawn in the exact same position on the 1605 map . It branches from the island, which is also depicted, and includes what appears to be one of the east-west artificial channels, probably (AC1).

**Leat 2 (L2)**

A shallow but very definite leat channel runs parallel with the river, traceable between the bloomery slag heap (SH1) and the upper wheelpit (DF4), where the side of the wheelpit is now breached allowing floodwaters to flow from the leat into the river. The function and source of this leat is far from clear. At the northern end it appears to diverge from the larger leat (L1) where any relationship has unfortunately been destroyed by a vehicle track which has disturbed the area. It is unlikely to be a branch of the larger leat but it is possibly earlier and the larger leat was built over part of its upper course. Its destination, if it ever continued beyond its present terminal point, is equally uncertain as the later dressing floors seem to have been built over it. However, any extension of its present course would mean it may have passed by the furnace area and could have been associated with the iron smelting period although the wheelpit and water supply arrangements for the smelting mill are unfortunately not clear. The average width of the channel is 2.5m with a low bank of upcast on the western side 2m wide by 0.3 high. The dry channel is heavily silted and filled with loam.

*Miscellaneous buildings*

**Building 1 (B1), SX 7269 7150**

Remains of a probable rectangular building sited on the floor of the broad, east-west gully (AC1), adjacent to the bloomery slag mound (SH1). The building now totally ruined, comprises an earth and loam covered, sub-rectangular mound of tumbled stone, measuring 3.9m wide by an undefined length. Slight vestiges of the inner wall face are visible on the south side, revealed during recent clearance work, which display a rough-stone construction incorporating killas and granite, including water-worn boulders. The western end of the structure and its immediate exterior have been disturbed by forestry vehicles. Growing from the northern wall of the building is a tall, mature oak tree with a girth of 2.7m, suggesting an age of at least 150 years. There is no visible evidence to indicate the function of this building. Although a water channel originating from the main leat, runs close by the southern wall, no wheelpit is visible and the position of an entrance or other structural or diagnostic details are not apparent.

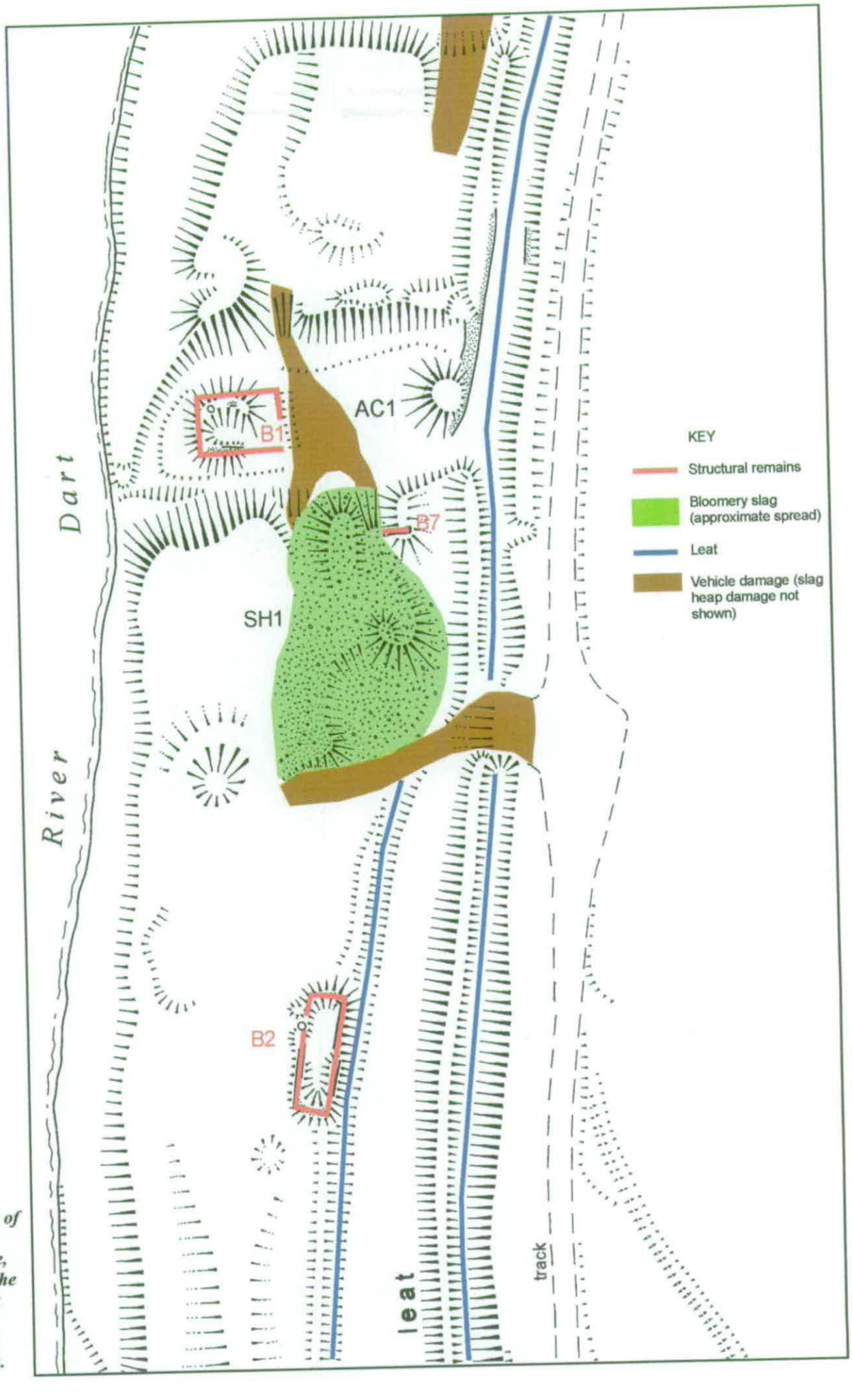


*Fig. 5. Interpretation of the northern part of the site, highlighting the bloomery slag heap, the leat and buildings (B1) and (B2).*

**Building 2 (B2), SX 7270 7143**

A narrow rectangular building aligned approximately north-south is sited on the level flood plain of the River Dart, 25m from the river and 25m south of the bloomery slag heap (SH1). The outline of the wall is clear along both long sides, with wall fabric standing to a maximum height of 0.7m. Approximate internal dimensions are 12m by 3.4m. Some tumbled stone surrounds the building and a small quantity covers the floor. However, the total quantity of fallen material suggest that the walls originally stood to no great height, and their slight construction, only 0.5m thick, could indicate that these remains represent the foundations of either a low-roofed building or support for a timber structure. The entrance was probably on the north-west corner, a position now occupied by a tree stump. Fragments of furnace lining lie within the tumbled stone suggesting the walls were constructed in part from remains from an earlier smelting phase, though it is unlikely that this building itself housed a furnace. A shallow leat channel(L2) passes adjacent to the east side of the building. The alignment of the two features, revealed on the earthwork survey, demonstrates that the leat is likely to have been constructed first though it could still have functioned after the construction of the building. However, tumbled stone from the building now obscures any relationship between the two and it is difficult to be certain of this.

**Building 3 (B3), SX 7270 7128**

A small, approximately square building of 2.5m and of unknown function, sited above the terrace of the northernmost dressing floor (DF4). The walls, constructed into the slope, from rough-hewn stones, stand to a maximum height of 0.7m and up to 0.8m thick. There is some tumbled stone but insufficient to have provided anything other than a low, turf-roofed shelter, similar to the tinners' huts of the high moors.

**Building 4 (B4), SX 7269 7118**

Sited just to the north of (B5), the vestiges of walling including an internal corner, are visible amid a crescentic heap of rubble. Internal dimensions would have been very approximately 4m by 2m.

**Building 5 (B5), SX 7269 7117**

A rectangular building with an annex on the north side. The walls, constructed from killas, are badly collapsed and the interior is now filled with rubble. Patches of walling are visible and the internal dimensions are 6.5m by 4.9m, standing to a maximum height of 1m. The annex which is probably an entrance porch, measures 2m by 3m and is ruined to foundation level. A fragment of a slate roof tile was noted as a surface find within the ruins of the main building. A short section of what might be a buried stone-lined conduit is exposed just outside and to the north of the building. It measures 0.2m by 0.2m in section. Its origin and destination are not known though it appears to run into or under the building.

*Miscellaneous features*

**Artificial channels**

**(AC1), SX 7270 7150**

To the north of the bloomery slag area (SH1) is a wide, apparently artificial channel which cuts across the alluvial plain at right angles to the river. It is approximately 20m wide and up to 2m deep. Although the area to the south of the channel consists of slag mounds, to the north, mounds of similar appearance are more likely to consist of river gravels and boulders

only, suggesting they are the spoil from the original excavation of the channel. At the eastern end of the channel, its relationship with the leat suggests it pre-dates the leat (see L1 above). A ruined building (B1) is located on the floor of the channel, towards the western end. The function of the channel is not obvious, although it is marked on the map of 1605 (Amery 1924) which confirms its date to be that of the iron smelting phase or earlier, rather than the 18th/19th century ore processing episode.

**(AC2), SX 7271 7154**

A second, smaller artificial channel, also running east to west, is located 30m north of the (AC1). It is approximately 6m wide by 1.2m deep. It connects with the leat on its eastern end, where the leat is breached in part. The channel may have served as a relief channel for the leat to regulate the flow of water.

**Rectangular earthwork (?)tailings pit (TP), SX 7268 7115**

South of and adjacent to the building (B5) is a low, sub-rectangular earthwork bank with an external ditch, enclosing a level silted area. The building is in fact built into the north-east corner of the earthwork. The feature measures 25m by 30m and the banks are 2.5 - 3m in width. The eastern exterior is defined by the leat running along the foot of the slope. This could be a tailings pit, used for settling waste materials suspended in the water, which could then be returned to the river. This would have been essential on this stretch of the River Dart to prevent pollution of domestic water supplies further down river. However, it is difficult to envisage how this water and waste material would have been diverted from the dressing areas to the settling pits without elaborate wooden launders running along the river edge. A water channel running from the south-east corner of the earthwork runs back into the river 35m downstream. It cuts through the lower section of leat (L1) which it would appear was redundant along this southern stretch when the possible tailings pit was in use.

It is notable that a linear gully which runs from the extractive area at Cleft Rock, down the steep slope to the track, is aligned with this rectangular feature. However, a relationship seems unlikely.

**Shafts ant trial pits**

Several (though not all) shafts and prospecting pits were recorded on the lower slopes of the woodland east of the main complex. Of the two shafts, one (S1) is sited 50m east of a possible blocked adit(BA) at SX 7276 7130. The shaft is open with a diameter of 2.5m and has a crescentic heap of spoil on the downslope side. The second shaft (S2) is adjacent to the track at SX 72717112 near where a linear gully meets the track, it is very similar to S1 though is now blocked.

**Possible blocked adit(BA), SX 7270 7130**

A possible blocked adit is visible emerging from the retaining bank of the large leat, north of the dressing floors. It comprises a cutting, which is walled off on the eastern side and is likely to have been filled and blocked off before the leat was constructed. A shallow water channel runs from the adit down to the river in a south-easterly direction. The adit is likely to be associated with the small open shaft (S1).

**Charcoal burning platforms (CBP1& CBP2)**

Three charcoal burning platforms were recorded on the lower slopes to the east of the main survey area (CBP3 noted but not surveyed). Each consists of a circular platform, terraced into the slope, measuring on average 5m in diameter. Soil removed to form the platform is deposited on the downslope side creating a crescentic bank. Large quantities of charcoal are visible on the surface and in the vicinity of the platforms.

**Pillow mound (PM), SX 7276 7125**

A possible pillow mound is sited 3m west of the mine track on the wooded slopes. The sub-rectangular mound measures 5m by 3m with a maximum height of 0.5m. It is surrounded on three sides by a shallow ditch of up to 2.5m wide. There is a tradition that Dartmoor miners, especially tin miners, would keep rabbits as a source of fresh meat to be consumed at the mine. This mound, if associated with the mine, would seem to authenticate this idea. A similar example may be seen at Wheal Chance on south-west Dartmoor (SX 597 700)

**DISCUSSION**

The extant field remains of the processing complex at Ausewell Wood almost certainly represent the processing of two separate types of ore and at least two phases of activity. The iron smelting which is documented in 1605 but could have even earlier origins, is represented by the blast furnace and blast furnace slag at the southern end of the site, and the bloomery slag at the northern end. Whether there is any chronological sequence within these two slightly different technologies at this site is yet to be established for certain and to do so would require excavation and scientific analysis. Traditionally however, bloomery smelting is believed to have been superseded by blast furnace technology and its possible that this site bears witness to this transition which would be exciting indeed. Unfortunately this survey has been unable to offer any new evidence to help clarify this relationship although several new observation may aid future enquiries. The site of a possible structure within the bloomery heap gives one fresh lead and the fact that the blast furnace has been interfered with during later episodes helps explain why the furnace evidence appears incomplete. Also important is the recognition of the dressing floors as a later imposition for processing copper and just possibly tin ores. This is supported by documentary evidence, giving a second phase to the site in the early 18th-century probably after the disuse of the iron smelting mill. Fragments of furnace lining built into other structures at the site offer tantalising glimpses into the remodelling of the site, though there is no certainty as to which episodes some of the miscellaneous buildings fit into. The fact that the bloomery and blast furnace evidence are placed at opposite ends of the site, some distance apart remains a mystery and the precise position of the bloomery furnace is yet to be identified.

The large leat(L1) remains something of an enigma. It certainly existed in 1605, though apparently only supplying the one iron furnace, and would therefore have been unnecessarily large in its present form. After passing the furnace the leat at one time continued downstream supplying features as yet unknown in the vicinity of the Lodge, though this extension may later have become disused when the dressing floors were constructed. The large volume of water the leat was capable of supplying was certainly needed for the four later wheelpits and may have been enlarged to cope with increased demand. The smelting mill appears to have been bypassed and modified so that water could be diverted onto the wheel of the dressing

floor (DF1). The smaller leat (L2) could be earlier than L1, being superseded by the latter. Unfortunately not enough of it survives to be certain.

The dressing floors were first recorded by Crombie (1982) though he did not term them as such and believed them to be associated with iron crushing but this seems unlikely. The RCHME survey has provided a fuller picture of these remains and their layout reveals they are almost certainly dressing floors for either tin or copper. They strongly resemble the layout of dressing floors at many Dartmoor tin mines of the late 18th - early 19th century such as those at Wheal Fortune (SX 5493 7540) and Keaglesborough (SX 5737 7012). Copper was usually processed in a slightly different way to tin, the ore often being crushed or 'spalled' using hammers near the place of extraction though low grade ores were stamped and occasionally processed in buddles as for tin. Although copper production is recorded for certain at Ausewell from Cleft Rock, there is also the possibility of tin production. However, the supporting documentary evidence for the working of tin, is in the form of a lease which does not necessarily mean that any tin was ever mined or processed. There is also the possibility that tin processing works were constructed in the expectation that tin may be exploited but was not actually used. This would not be untypical for Dartmoor mining enterprises of this period.

There is a small possibility that tin could have been imported for processing from the opposite, west side of the River Dart. A large adit survives at SX 7263 7136, probably an outlier of Holne Chase Tin Mine, and transporting ore across the river via a ropeway or some such apparatus would not have been difficult and would have been an easier alternative than transporting ore to the Holne Chase Mine's own dressing floors which were some distance away at SX 714 711. But in the absence of any evidence, this has to remain a matter for conjecture.

**RECOMMENDATIONS FOR FURTHER RESEARCH**

1. Sampling of residues at dressing floors, i.e. tailings, settling area, tail races, tailings pit. This would help establish the precise nature of the ores being processed.

2. Accurate field survey of mines at Cleft Rock and to the east, to establish the full extent of extractive activity in the area, in conjunction with recommendation 3.

3. A geological evaluation of Cleft Rock and associated remains to establish mineralisation of the mine.

4. Establish additional functions and destination of leat (L1) to determine the chronology of surviving remains

5. Scientific analysis of the slags.

6. Exhaustive documentary research into the mines of Ausewell and Holne Chase.

## RECOMMENDATIONS FOR MANAGEMENT

The site is currently located within private land with no public access, there is therefore no threat from visitor erosion for the foreseeable future. Dense vegetation has recently been cleared from the site leaving only mature trees. Leaf mould from the trees currently provides a thick blanket of protection for the fragile remains. However, several trees are growing amidst the structures and their condition will need to be monitored to assess the risk of them falling and uprooting the remains. It would be sensible in future to avoid using vehicles on the sensitive areas of the site, which is effectively the entire area to the west of the track. Several pieces of important evidence have already been disturbed by past vehicle activity.


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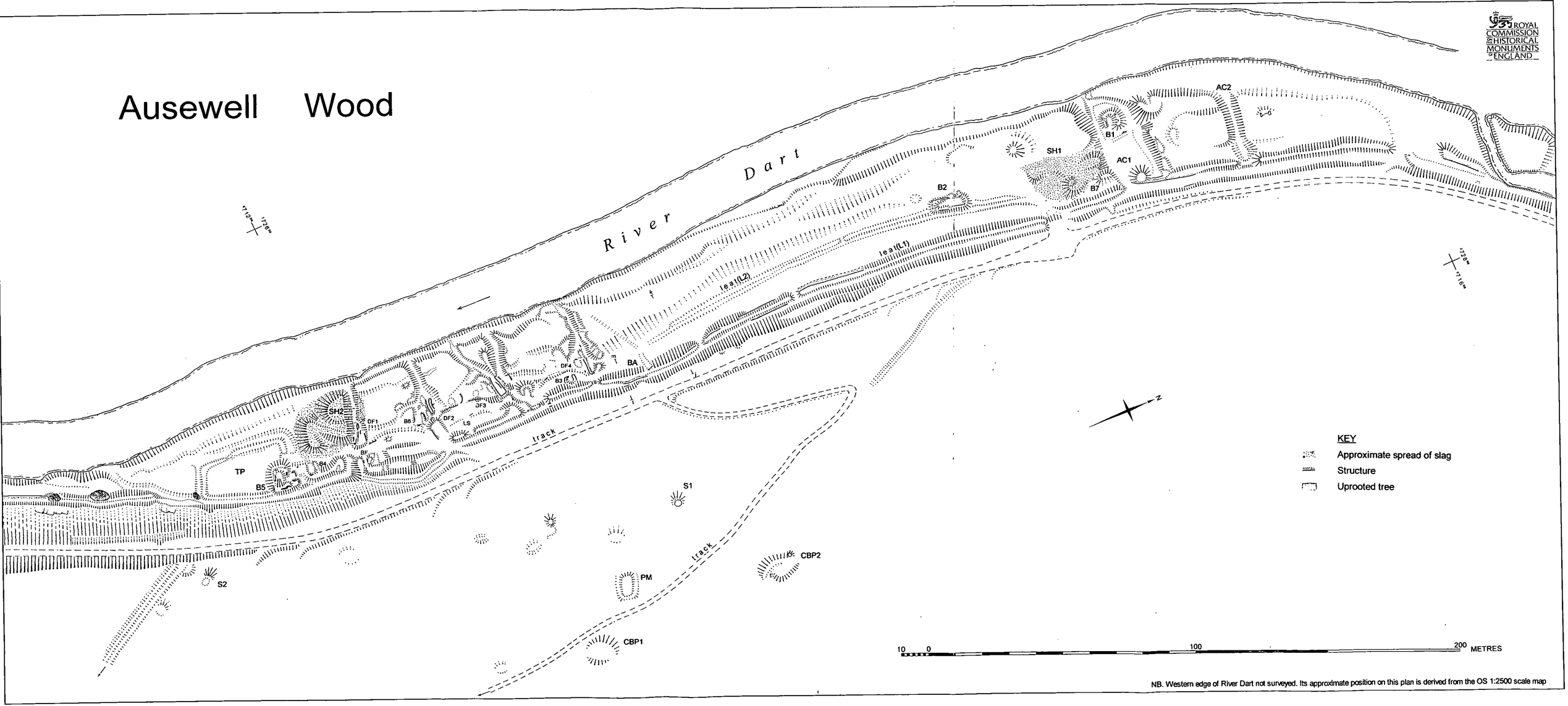
# Ausewell Wood




NB. Western edge of River Dart not surveyed. Its approximate position on this plan is derived from the OS 1:2500 scale map

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