

TEMPLE MINE SURVEY (2007)



40 foot wheel-pit – Temple Mine

Edited by Graham Levins



**Welsh Mines Preservation Trust
Yr Ymddiriedolaeth Cadwraeth
Mwynfeydd Cymru**

TEMPLE MINE SURVEY

LOCATION:-

Temple Mine, Ysbyty Cynfyn, near Devil's Bridge, Ceredigion.
Grid reference SN 749 793.

DATE OF SURVEY:-

31st March / 1st April 2007

SURVEY CARRIED OUT BY:-

Site survey - Nigel Chapman, Professor David James and Graham Levins assisted by members of the Welsh Mines Preservation Trust.

Desktop historical survey – Graham Levins, with additional material and assistance from Simon Hughes.

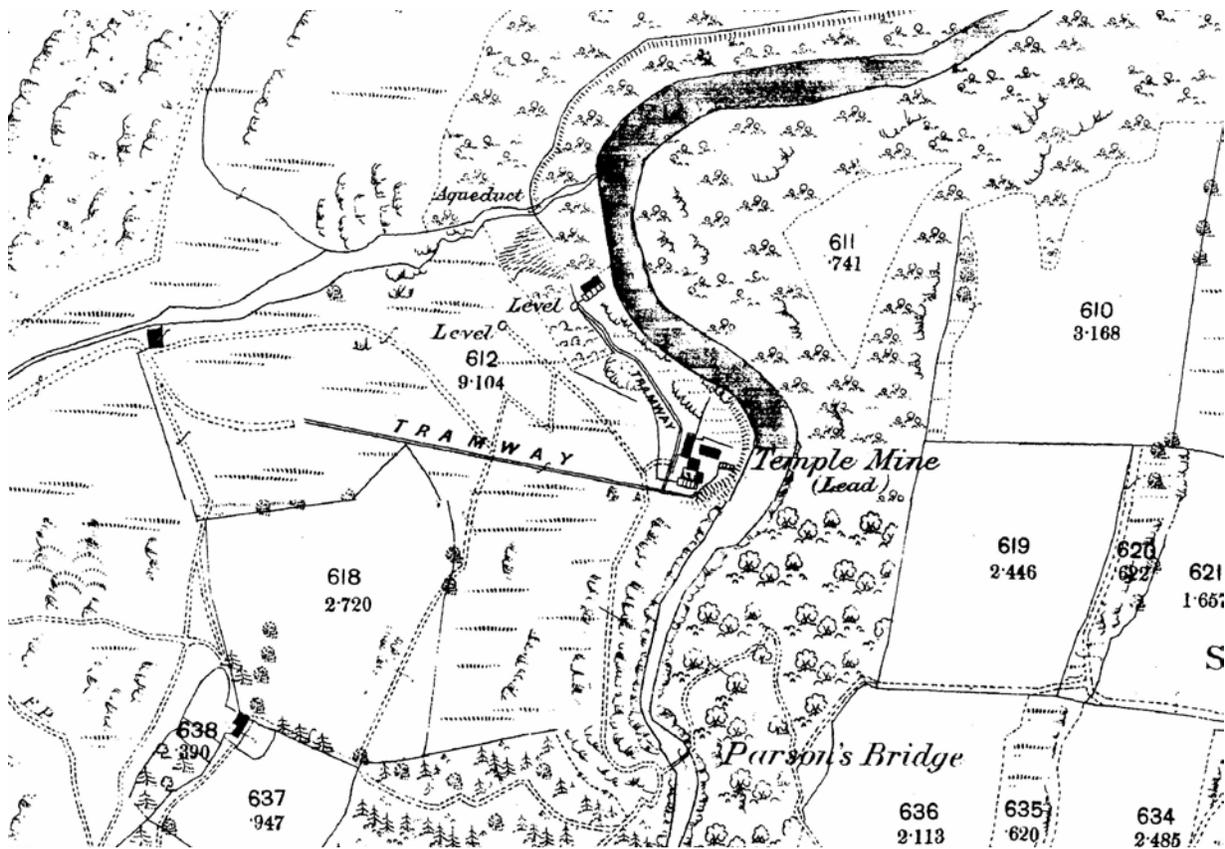
Photographs by Graham Levins, Nigel Chapman

PURPOSE:-

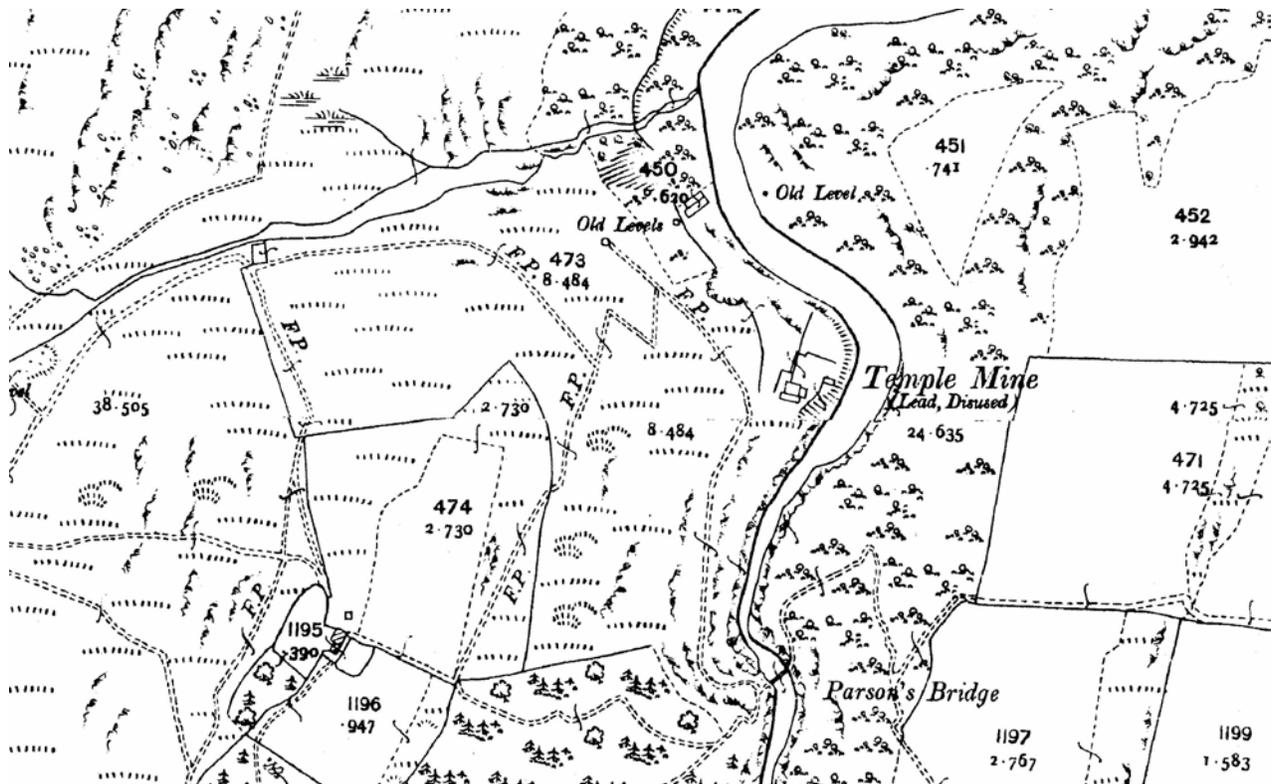
The survey was carried out at the request of the owners of the site The Countryside Council for Wales, due to concerns over the long term stability of the 40 foot wheel-pit. They wished to have the site surveyed and recorded while the wheel-pit was still standing.

CONTENTS:-

- Site survey report
- Desktop historical survey report
- Maps, diagrams, plans
- Photo gallery of site survey
- Photo gallery of my previous visits to Temple
- Historical photo gallery



Extract from 1st Edition 25 inch map (1888), showing Temple Mine.



Extract from 2nd Edition 25 inch map (1905), showing Temple Mine.

WELSH MINES PRESERVATION TRUST SURVEY OF TEMPLE MINE – SN 749 793

Over weekend 31 March / 1 April 2007, members of the Welsh Mines Preservation Trust carried out a survey at Temple Mine. This survey was carried out due to concerns about the long term stability of the 40 foot wheel-pit and a desire by the land owners the Countryside Council for Wales that it should be fully recorded and surveyed while it is still standing. The site was previously surveyed by Robert Protheroe Jones in February 1993 (copy included). A desk top survey was carried out before the weekend to collate all available published information and details, plans and photographs from other sources. A brief history of the mine and copies of all information is included in this report, which begins with the site survey and is followed by the desk top survey.

I am pleased to report that the condition of the south east corner of the 40 foot wheel-pit has not deteriorated any further since my visit in July 2006, this was probably due in part to the mild winter. There is still concern over the long term future of this magnificent structure, which is unique in Mid Wales. The Trust is anxious that a project can be organised that will ensure its survival.

Features that were not surveyed and examined on this occasion were the rock-cut level part way up Nant Y Moch, the leat, East Llwyn Teify Mine and the level at Dolgamfa Farm, (although I was present in 1993 when the level was drained and surveyed, I have added the survey and photographs to this report). We are planning to return in the future and survey the items above.

The following report of the survey is written by Trust Director Nigel Chapman:-

Dressing Floors.

A wheel pit of 1878 aligned west to east for a 30 feet by 4 feet water wheel. Constructed of sandstone flags, it is still in good condition and complete with a round brick lined arch to the east wall. Water having driven this wheel went through the arch, was turned north along a platform to feed a further wheel of 14 feet by 2 feet on the dressing floors.

The 30 feet by 4 feet wheel was employed to drive a crushing mill with rolls of 24 inches diameter. It also drove a Blake's stone breaker which was probably placed on the tapered stone plinth to the west of the wheel pit. Against the north wall of the wheel pit are the substantial stone walls of the crushing mill. In the north corner of the east wall a doorway opening was noted. Further to the east, built into the junction of the wheel pit and the crusher is a small building of unknown use. To the north of the mill is an extensive area of levelled crushed waste forming the site of the jiggers and ore separating plant. Most of these machines would have been powered by a 14 feet by 2 feet water wheel placed at the eastern edge of the levelled area and just above the river Rheidol. To house the wheel a rough cutting was made into the underlying rocks and pockets cut into the rocks to carry timbers supporting the wheel axle above ground level. At the eastern end of the cutting a drill hole was found. Further north, probably in alignment with the axle of this wheel are the stone cut foundations of a circular buddle most likely powered by the wheel. A further buddle is said to be located on this levelled area but nothing was noted on the surface. The area of the buddle is about a metre below the level of the ore separating plant and would have been fed by gravity. A stone wall aligned east to west was found to separate these two areas of the dressing floors. On the same alignment was found a timber box section channel probably to feed slimes from the ore separating plant to the buddles. North of this area a large dump of fine sand remains above the river, being the waste left at the end of the dressing processes.

FEATURES AT TEMPLE MINE

Possible Blacksmith's Shop

40 foot wheel-pit

Cart Track to Bwlchwyn

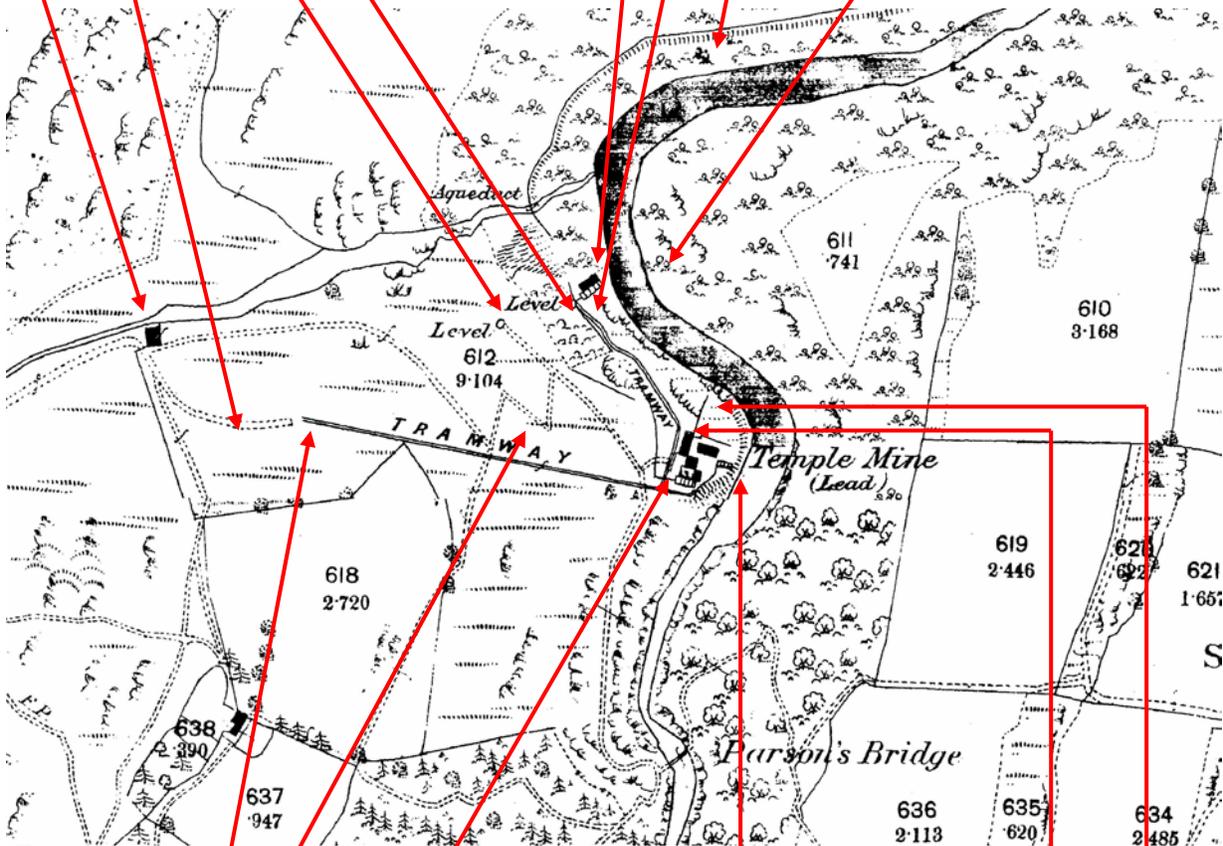
Deep Adit

Middle Adit

Leat

East Llwyn Teify Adit

Top Adit



Inclined Tramway

Zig Zag Track

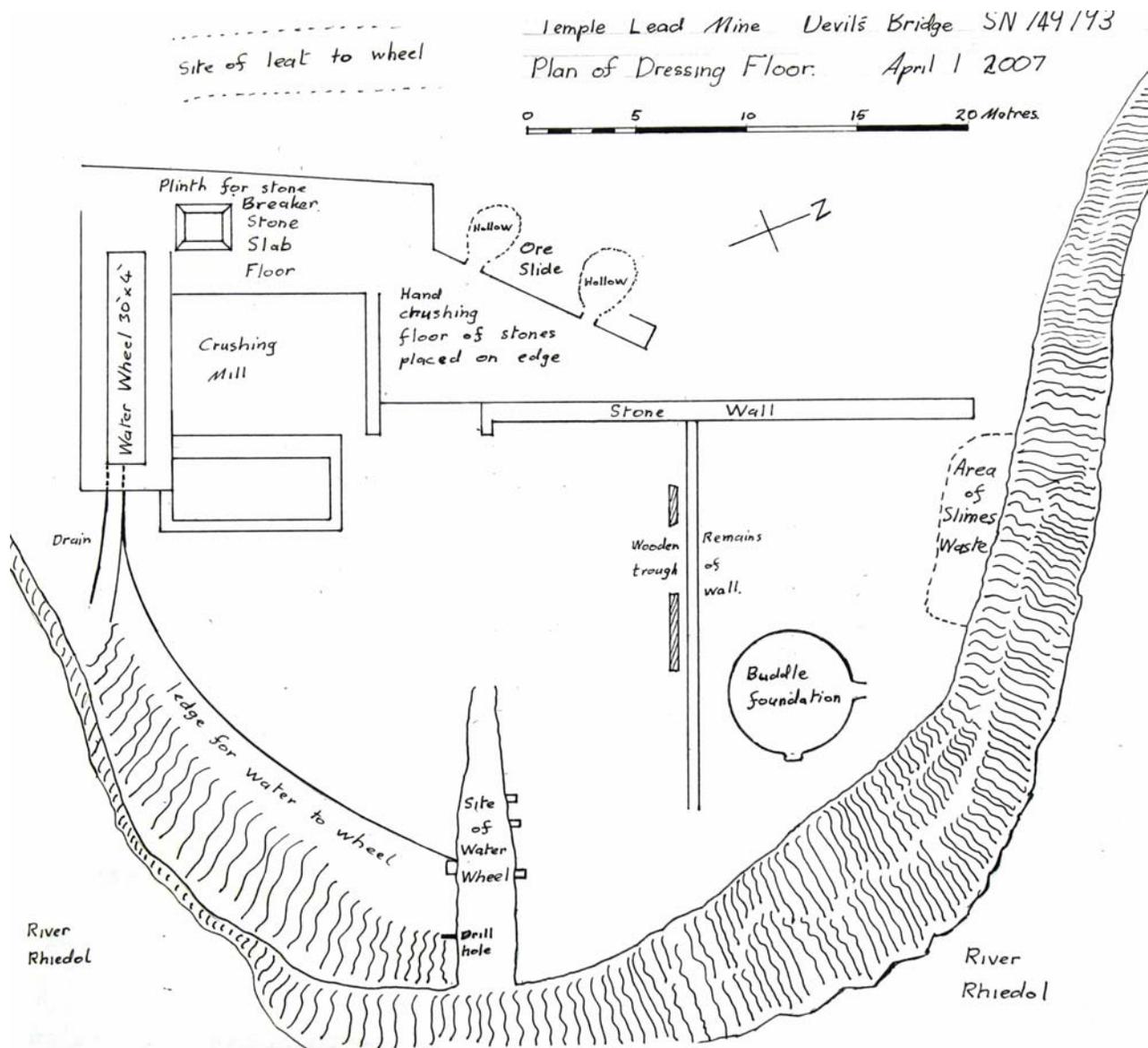
30 foot wheel-pit
and Blake's Stonebreaker

14 foot wheel-pit

Ore Bins

Buddles

West of this platform is a long stone wall of about 3 metres high forming the edge of a platform for the breaking down of large lumps of lead ore prior to crushing. To the south near the crushing mill this platform is paved with large flat stones to permit the feeding of the crushing mill by wheel barrows. To the north small stone have been placed on edge to form a "Bucking" or hand hammering area for the first reduction of the large lumps of ore from the mine. Placed to the west of this area and on a slightly different alignment is a two celled Ore Slide. Much of the front wall has fallen while the two cone-shaped ore slides are filled with rock and waste. West of this feature is the foundation of a tramway used to bring ore in trams from the mine to the dressing floors. On a similar alignment to the tramway and further west is a well marked section of the leat, formerly supplying water to the dressing floors. Slightly uphill and to the west at this point is a levelled platform not shown on any of the maps, probably the site of a timber building of unknown use. Either a tool store or office would seem likely.



Incline.

To the south of the 30 feet wheel pit and on a similar alignment was an incline up the steep side of the Rhiedol Valley to more gentle gradients and a railhead in a rough field. Apart from a slight hump which could be natural nothing remains of the railway in the field while the rough cart track it meets can be traced over the hill top to Ystumtuen. On the hillside a shallow track forming the incline was

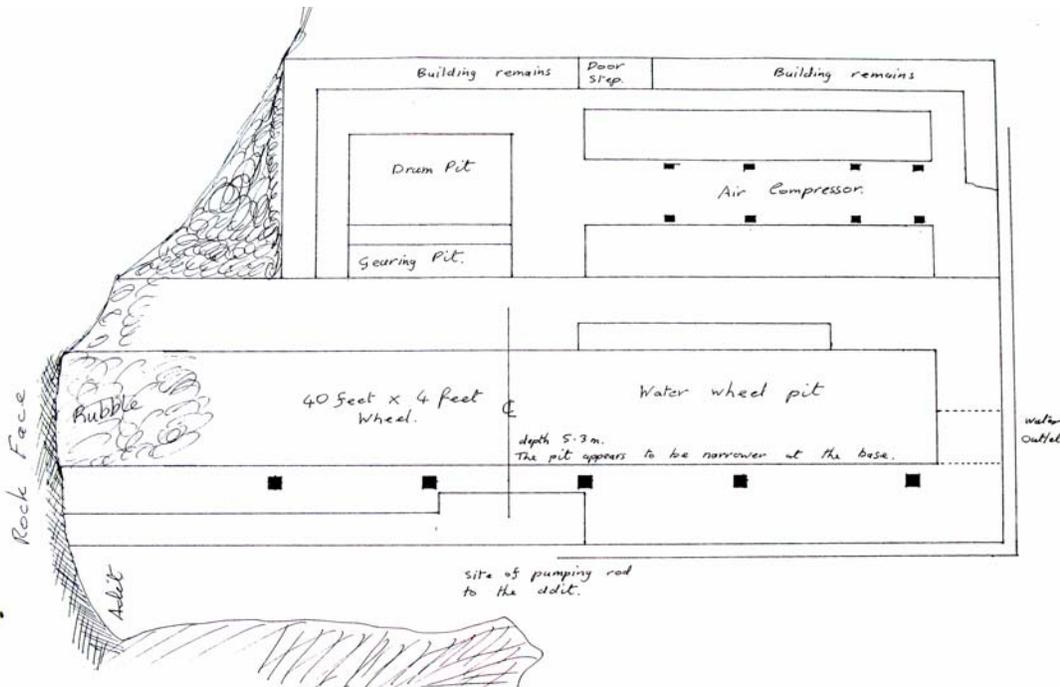
found, but nothing else. It suggests the tramway was of light construction or never got passed the basic earthwork stage. To operate the incline a wire was said to have been taken from the huge water wheel housing placed to the north west of the dressing floors. Some form of wheel would have been used in the field to draw up the incline the wagons of processed ore from the mine, again nothing was found.

A noticeable feature of this hillside is the zig-zag track from the 40 foot wheel pit and a second branch from the Top Level adit of the mine. While narrow suggesting the use only by walkers, it is possible that horses would have been able to use the track. It could be that in the early days of the mine, any ore would have been transported by horses up this track.

One of the major questions left is how the machinery was transported down the hillside to be erected on the mine. The opposite would have happened when the mine finally closed.

Blacksmith's Shop.

Placed near the cart track to Ystumtuen, on a north south alignment is a single storey stone built possible workshop. The east wall has a widow opening and two doorways, all now blocked up. Inside built against the north gable end wall is a large stone structure which could be the remains of a Blacksmith's hearth. Noted in the gable wall above this feature is a chimney flue. Probably the miners would have walked from Ystumtuen over the hills to the mine, getting their tools sharpened here ready for the next day.



Forty Foot wheel pit.

Further to the north up the Rheidol Valley was erected the main power plant of the mine. Placed on the course of a major vein system, originally the plant consisted of a 40 feet by 4 feet wide water wheel operated by a leat drawn from the River Rheidol about a mile to the east. At first the wheel was used to pump water from the mine. Later a winding drum in a stone built pit with a long narrow pit for the gearing was constructed. Probably by the 1880's a further pair of pits with a long engine bed in the middle was built. On the bed a single horizontal cylinder air compressor was constructed. Compressed

air for the mine to drive drills, pumps and winches was taken underground and held in a large air receiver.

It has been stated that the wheel powered two drums, one for winding from a shaft in the Middle Level and one for working the incline. While the incline is noted as requiring over 400 yards of wire rope, the underground winding would have used a much shorter rope. For these two incompatible winding systems to work would have required the de-clutching of one drum while the other was working. Another problem would have been the need for two different sizes of drum, while the drum pit is a "one size fits all" construction.

Underground.

The workings are centred on three levels. Deep Adit is at the south side of the wheel pit and contains the pumping plant. Middle Adit comes to day in front of the wheel pit and at the level of the surface tramway. Top Adit is up the hillside with a large rock tip at its portal. Underground Middle Level has plenty of timber sleepers in place, being apparently the major haulage road for the huge stope found several hundred yards in from the surface. Much of the level is built on timber stemples over the open stope and has in places collapsed. This logically would have been the main haulage road for the Deep Adit to bring the output up to the tramway level. However no evidence for such a use was found. Deep Adit goes in along side the wheel pit with timber and ironwork left from the pumping plant. A series of horizontal iron rods were suspended from timber and iron strapped vertical posts arranged so that movement of about 5 feet was possible. Kept up in the roof space this flat rod system terminated in a large timber inverted "T" or Quadrant standing over a 20 fathom shaft sunk in the floor of the level. The quadrant is mounted on a horizontal timber beam above the level to permit a tramway to pass underneath. The shaft is now filled with rubbish with an iron Rising Main from the pump still in place. From the nose of the quadrant a chain still disappears into the rising main, connected to the pump in the bottom of the pipe. Probably of the Bucket type the pump only needed to lift the water which would stood on a non-return valve in the base of the pump. On the shaft edge was an iron bar bent over ninety degrees with a chain secured to it. The chain disappeared into the filling of the shaft and could have supported the pump or something else suspended in the shaft. Along the Deep Adit a 2 feet gauge tramway was laid using bridge rail. It would appear that the waste rock from the shaft sinking was trammed out along the level and dumped beside the wheel pit to be washed away by the river.

The pumping quadrant while still on its timber beam has lost the King post which is laid in the level and the tie rods complete with the iron King post cap have slid down towards the floor. The quadrant has nose dived onto the rising main, but is still basically complete and connected to the pump. The rod from the water wheel is connected to the King post cap and has a couple of sections of iron rod complete with a vertical timber hanger in place. From these items a reconstruction of the shaft top pumping plant could be done. No evidence of a balance box either on the surface or underground was found.

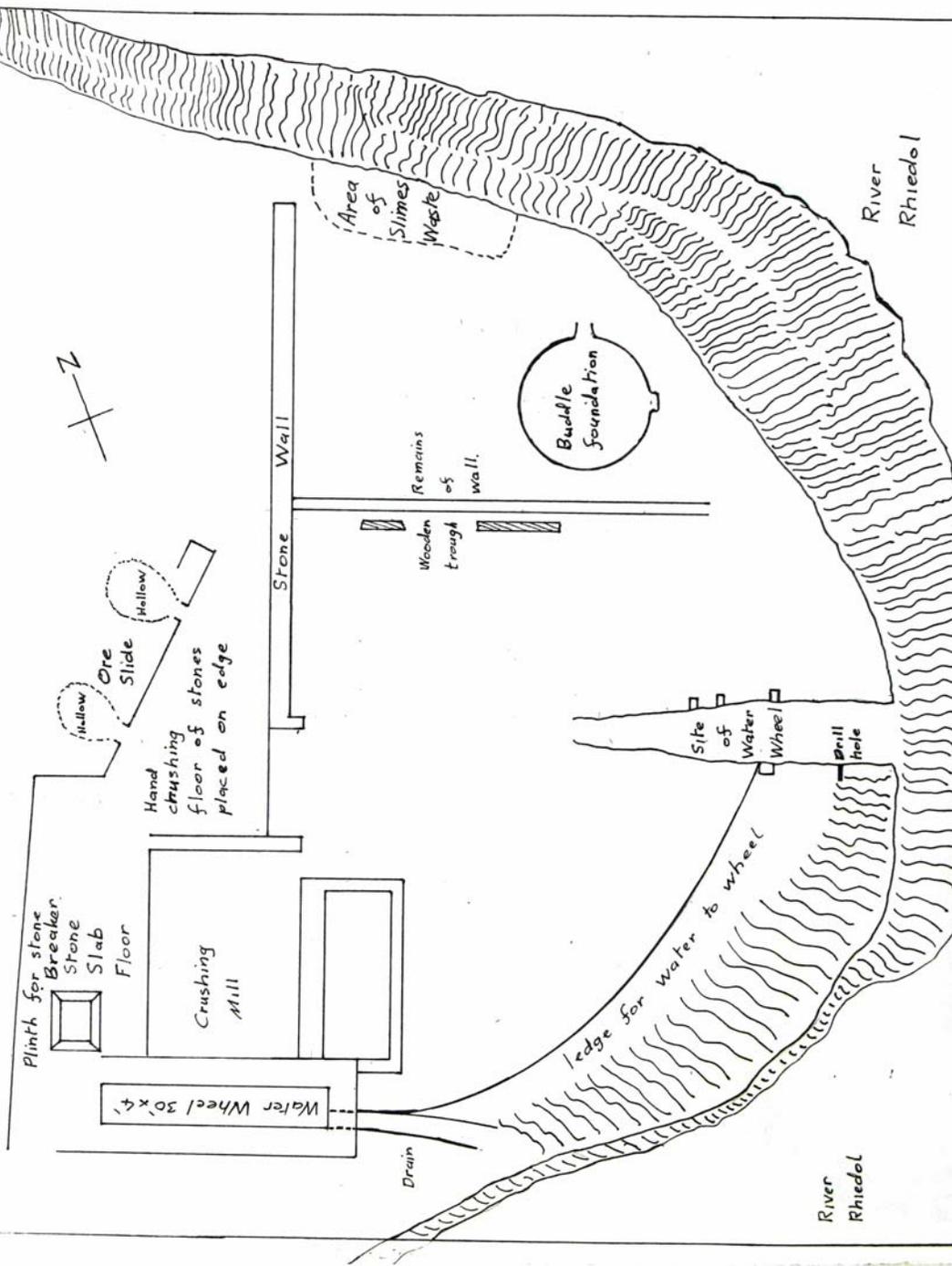
Nigel Chapman April 2007

PLAN OF DRESSING FLOOR APRIL 2007 – NIGEL CHAPMAN

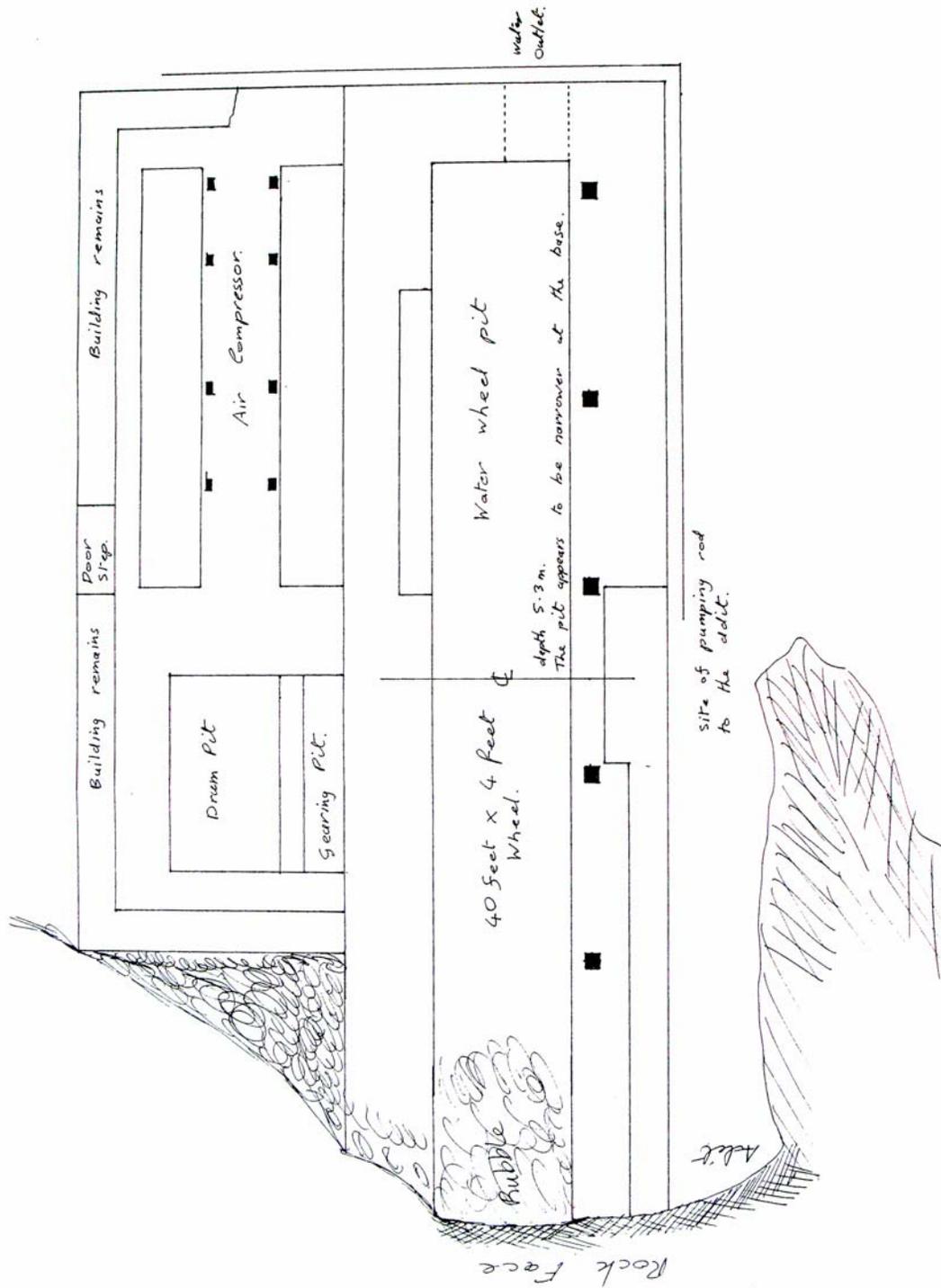
Temple Lead Mine Devils Bridge SN 149193

Plan of Dressing Floor. April 1 2007

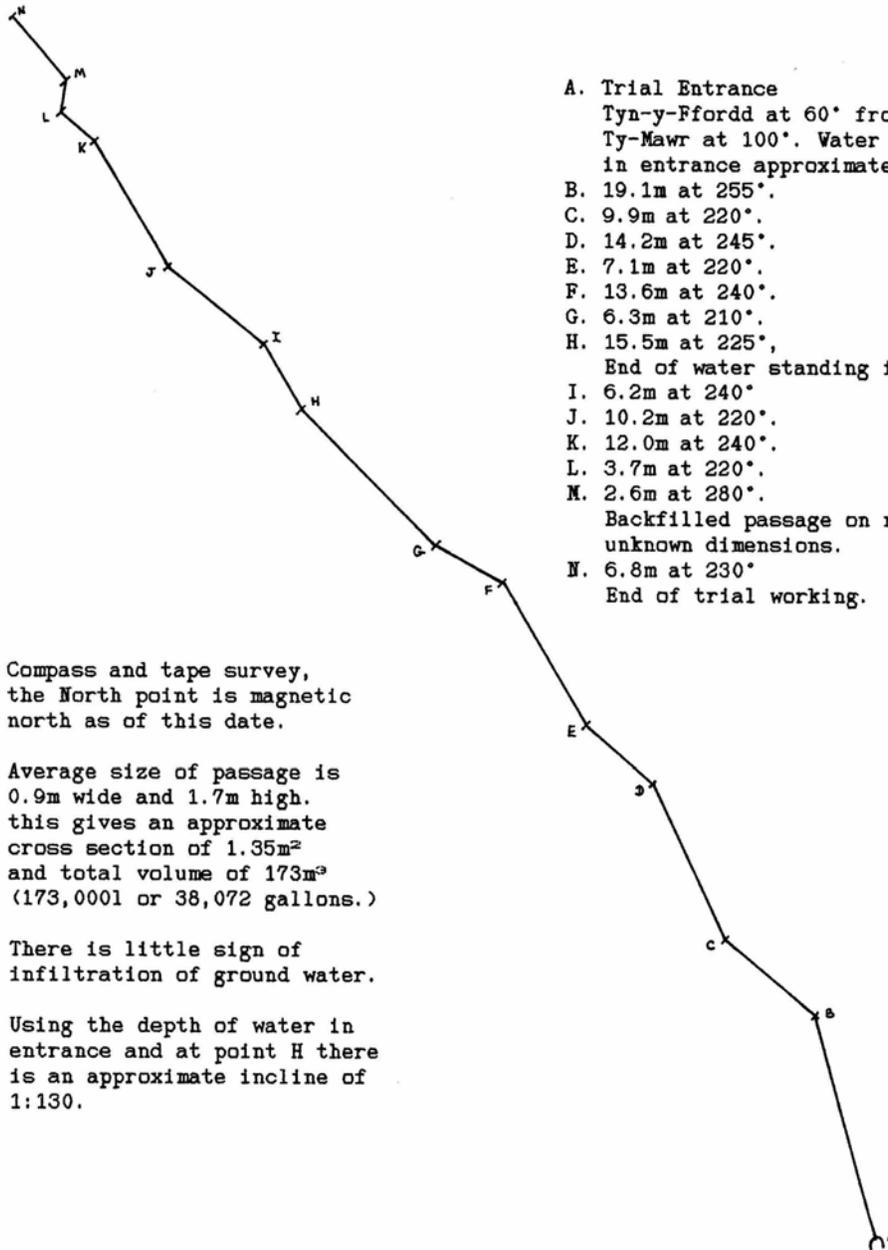
site of lead to wheel



PLAN OF 40 FOOT WHEEL-PIT APRIL 2007 – NIGEL CHAPMAN



Survey of Upper Trial Level, (Llwynteifi Eastern Adit) Temple Mine SN 7466 7821 10/07/1993.



- A. Trial Entrance
Tyn-y-Ffordd at 60° from A,
Ty-Mawr at 100°. Water depth
in entrance approximately 0.65m.
- B. 19.1m at 255°.
- C. 9.9m at 220°.
- D. 14.2m at 245°.
- E. 7.1m at 220°.
- F. 13.6m at 240°.
- G. 6.3m at 210°.
- H. 15.5m at 225°,
End of water standing in tunnel.
- I. 6.2m at 240°
- J. 10.2m at 220°.
- K. 12.0m at 240°.
- L. 3.7m at 220°.
- M. 2.6m at 280°.
Backfilled passage on right,
unknown dimensions.
- N. 6.8m at 230°
End of trial working.

1. Compass and tape survey,
the North point is magnetic
north as of this date.
2. Average size of passage is
0.9m wide and 1.7m high.
this gives an approximate
cross section of 1.35m²
and total volume of 173m³
(173,000l or 38,072 gallons.)
3. There is little sign of
infiltration of ground water.
4. Using the depth of water in
entrance and at point H there
is an approximate incline of
1:130.

Surveyed:-
Kelvin Davies, Colin Broadbent

Drawn:- CMB, Scale 1:500.

Date:- July 10th 1993.

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SMR N° 9342

CERIDIGION UPLAND ARCHAEOLOGY: METAL MINES.

Name of Mine: Temple

N.G.R.: SN 749 793

Synonyms:

Estimated Output in tons:

Lead Concentrates:

300

Altitude: 600' ~~600'~~

Zinc Concentrates:

50

1:2,500 County

Sheet Number:

7.16

Copper Concentrates:

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Known Early

Mining Site?:

References (see introductory sheet for full details of the first eleven works):

J.R. Foster Smith "Mines of Cardiganshire" Mine no. 142, Page No. 62-3

D.E. Bick "Mines of Mid Wales" Vol. 2, Page 27-8

G.W. Hall "Mines of Southern Wales" Page _____

O.T. Jones "Lead & Zinc Ores of N. Cards. & W. Montgom." Page 148-9

T. Spargo "Mines of Wales" Page _____

A. Francis "History of the Cardiganshire Mines" Page _____

Liscombe & Co. "The Mines of Cards, Montgom., & Shrops." Page _____

W. J. Lewis "Lead Mining in Wales" Page 193

F. J. North "Mining for Metals in Wales" Page _____

T. M. Thomas "The Mineral Wealth of Wales and its Exploitation" Page _____

R. Burt, P. Waite, & R. Burnley: "The Mines of Cardiganshire" Page 85

Other References (an asterix indicates that full details of the work are on the introductory sheet):

R.H. Bird: p. 26 in "Notes on Mining Leats", pp 19-45 in British Mining

N° 37, Northern Mine Research Society, Sheffield, 1988.

* Palmer & Neaverson 1989a pp. 23-4, 38

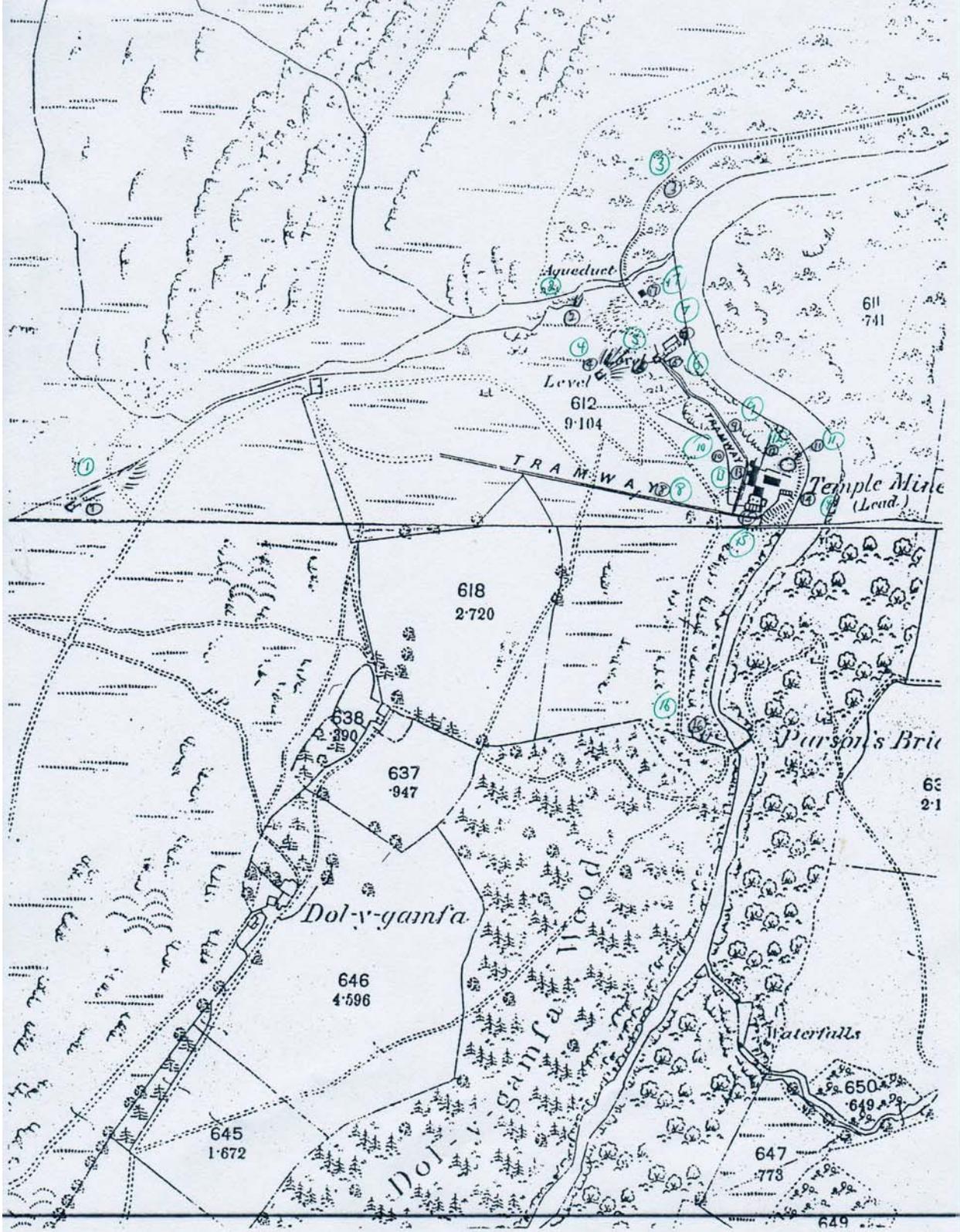
* Roes 1975 p. 239

* Palmer & Neaverson 1989 b pp. 320-321, 323, 340, 347

Protheroe Jones, September 1992.

42 TEMPLE 1ST EDN.

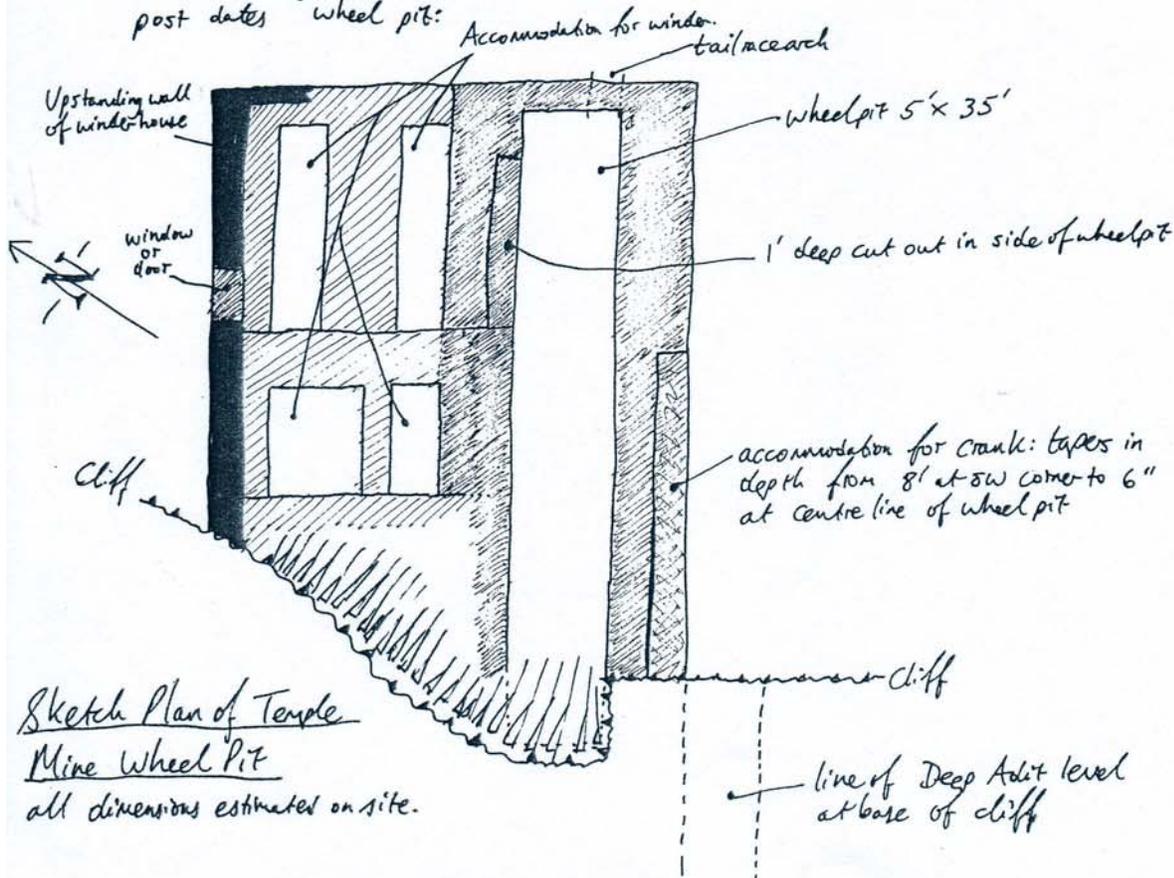
N 9342



142 Temple.

Visited 6.II. 1993.

- ① Rock cut level: just open; very wet. Plus associated grassy tip.
- ② Rock cut level.
- ③ Leat in good condition
- ④ Rock cut level: open; and associated development rock tip.
- ⑤ Rock cut level beside tramway: open.
- ⑥ Rock cut level below tramway and beside wheelpit. Entrance very high to accommodate flat rods (to underground pumping shaft) from crank on south side of wheelpit)
- ⑦ Large good condition wheelpit and winder to north - probably wound underground shaft in Deep Adit via Middle Level. Winder post dates wheel pit:



No trace of Incline.

PRN 4.34 L Temple (142) page 2 of 2

- ⑨ Tramway formation remains in good condition.
- ⑩ Leat remains in fair condition.
- ⑪ Outline of budolte cut into rock.
- ⑫ Retaining wall 6' high.
- ⑬ Two ore bins, completely filled in. East faces somewhat ruinous. No remains of building to east but pitched bucking floor survives.
- ⑭ Only remains of small waterwheel is a cleft in the rock. No remains of building shown in centre of dressing floors.
- ⑮ Wheelpit in fairly good condition; crusher house very ruinous; building to east virtually disappeared; building to north has left no trace.
- ⑯ Small rock cut level.
- ⑰ Flooded rock cut shaft.

The following Geological Report is written by Trust member Professor David James

Temple Mine, Ysptytyn Cynfyn; WMPT survey, 01/04/2007 - Geology

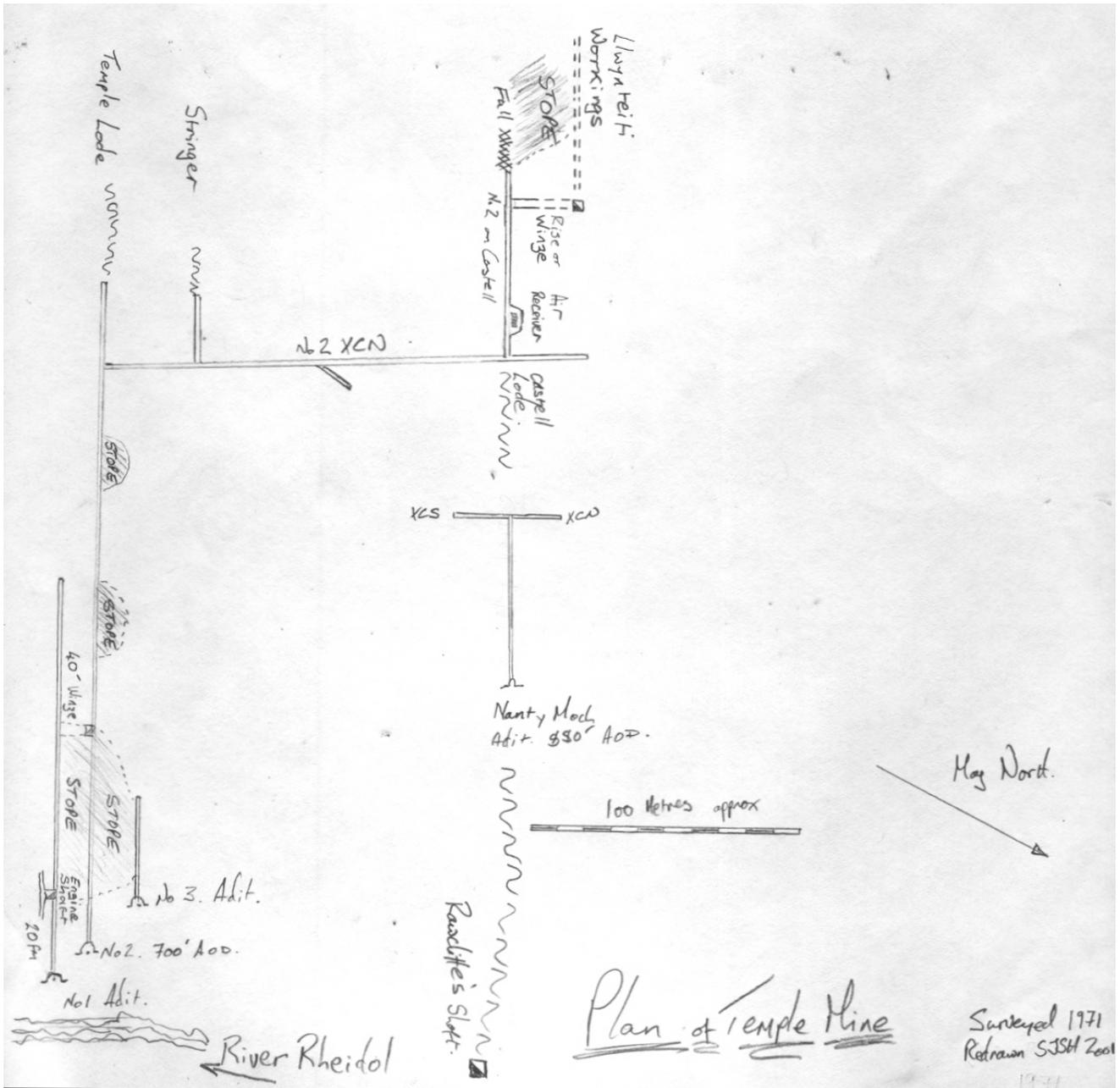
The lode at Temple is a small fracture with a fabric striking 042° - 056° and dipping southeast between 60° and 85° ; average strike is ca 048° and average dip ca 72° . It lies ca 75 metres SE of the major southeast-dipping Castell lode which was tested without success nearby at Rawcliff's shaft and which strikes ca 063° , ie. not precisely parallel. Slickensides indicate a small component of dextral strike-slip; this is also seen on the Castell lode. Throw is unknown but probably less than 20 metres. In modern terminology the lode is developed in the Derwenlas Formation, dying out upwards into the Cwmsymlog Formation and downwards into the Cwmere Formation; in the terminology of the 1922 memoir by O.T.Jones its productive portion thus lies in the basal Frongoch Formation. All these formations are of early Silurian age.

The geometry of the orebody is not precisely defined owing to incomplete access in the middle adit where a false floor has collapsed) but the best ore was worked over a vertical extent of ca 60-70 metres and a horizontal extent (in the deep adit) of ca 32 metres. The lode dies out laterally quite quickly, at deep adit portal it is a thin breccia; at ca 75 metres drivage it swells to over two metres where stoping was begun. Where stoping ended a further 24 metres was driven in an irregular fracture with little sign of mineralisation. The ore thus appears to lie in a steep shoot. A trial was begun just across the river to the northeast of the wheelpit but the fracture was clearly not worth pursuit there.

The geological value of the deep adit as affording safe access for education and research is considerable; the internal fabric of the lode is well exposed as are wall rocks. The deep adit drivage of ca 131 metres allows demonstration that the lode crosses an anticline (obliquely) and that the main oreshoot essentially lies in the fold core. The ore was stripped out very efficiently and no minerals of value to collectors remain.

David James April 2007

SIMON HUGHES PLAN OF TEMPLE MINE (1971)



I am most grateful to Robert Protheroe Jones for making his survey available; this was invaluable to our survey. I must also express my gratitude to Nigel Chapman for his survey report, to Professor David James for his geological survey report, to Simon Hughes for all the historical information and photographs he generously made available to me. My thanks also to Colin Broadbent and Kelvin Davies, for their survey of the Upper Trial Level (Llwyn Teify Eastern Adit) on Dolgamfa Farm.

Last but not least I must thank the members of the Welsh Mines Preservation Trust and representatives of Ceredigion County Council's "Spirit of the Miners" project who attended over the weekend and assisted with the survey:- Nigel Chapman, Professor David James, Robert Ireland, Jenny Gowing, Tony King, Barry and Mary Dupree, Dr Ania Skarzyenska, Barry Clarke, Geoff Fitton, Geoff Newton, Kelvin and Dalton Davies, Peter Austin, Meleri Richards, Leasa Fielding, Doreen and Trefor Levins.

Graham Levins
Secretary
Welsh Mines Preservation Trust
May 2007