WEMYSS METAL MINE, CEREDIGION, GROUND INVESTIGATIONS II: ARCHAEOLOGICAL WATCHING BRIEF

DAT Archaeological Services

Prepared by Dyfed Archaeological Trust
For: Natural Resources Wales

REGISTERED ORGANISATION CIfA

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WEMYSS METAL MINE, CEREDIGION
GROUND INVESTIGATIONS II
ARCHAEOLOGICAL WATCHING BRIEF

Client	Natural Resources Wales
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WEMYSS METAL MINE, CEREDIGION, GROUND INVESTIGATIONS II ARCHAEOLOGICAL WATCHING BRIEF

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EXECUTIVE SUMMARY

DAT Archaeological Services were commissioned to undertake a watching brief in March and April 2023 during groundworks associated with geotechnical investigation works at Wemyss Metal Mine, Ceredigion (PRN 23230, NGR SN 71579 74089).

The watching brief demonstrated that the geotechnical investigations carried out during the watching brief did not disturb or damage any significant built structures or archaeological deposits associated with the former mine.

CRYNODEB GWEITHREDOL

Comisiynwyd Gwasanaethau Archaeolegol YAD i gynnal brîff gwylio ym mis Mawrth ac Ebrill 2023 yn ystod gwaith daear sy'n gysylltiedig â gwaith ymchwilio geodechnegol yn Mwynglawdd Metel Wemyss, Ceredigion (PRN 23230, NGR SN 71579 74089).
Roedd y brîfff gwylio yn dangos nad oedd yr ymchwiliadau geodechnegol a gynhaliwyd yn ystod y brîfff gwylio yn amharu ar nac yn difrodi unrhyw strwythurau adeiledig sylweddol neu ddyddodion archeolegol yn gysylltiedig â'r hen fwynglawdd.

1.1 INTRODUCTION

1.1 Project Commission

1.1.1 DAT Archaeological Services were commissioned by Natural Resources Wales to undertake an archaeological watching brief during geotechnical investigations at Wemyss Mine, a former 19th century lead and zinc mine (PRN 23230) approximately 14.6km southeast of Aberystwyth in Ceredigion (Figures 1 and 2).

1.1.2 The proposed geotechnical investigations were required to provide information to assess the geotechnical, geo-environmental, geological and or hydrogeological ground conditions to inform the outline design of remedial engineering interventions.

1.1.3 Following discussions with the archaeological curator Dyfed Archaeological Trust-Development Management (DAT-DM) it was recommended that an archaeological watching brief should be carried out during the geotechnical investigations, as several of the proposed inspection test pits were situated within archaeologically sensitive areas of the mine. However, not all the proposed geotechnical test pits were deemed to lie in archaeologically sensitive areas, and Test Pit Nos 101-107 shown in the drawings within the approved WSI were not monitored during their excavation.

1.1.4 Test Pit No 109 could not be excavated because of the amount of surface water at this location and was abandoned.

1.1.5 Test Pit No 116 was abandoned as the sides of the pit kept collapsing.

1.1.6 Two further test pits, Test Pit Nos 120-121, were excavated in addition to those shown in the WSI.

1.1.7 Therefore, the excavation of ten geotechnical test pits were monitored during the watching brief.

1.1.8 The area of Wemyss Mine was the subject of a Historic Environment Desk-Based Assessment by DAT Archaeological Services in 2016 (Bell et al 2016), which was later updated in 2020 to include two new areas (Bell 2020).

1.2 Scope of the Project

1.2.1 A Written Scheme of Investigation (WSI) for an archaeological watching brief was prepared by DAT Archaeological Services prior to the commencement of the works (Appendix I). The WSI outlined the project objectives as:

- Provision of a written scheme of investigation to outline the methodology for the watching brief which DAT Archaeological Services will undertake:
- To monitor ground works in order to identify the presence/absence of any archaeological deposits;
- To establish the state of preservation, character, extent and date range for any archaeological deposits identified;
- Production of a report and an archive of the results.

1.2.2 The aim of the watching brief is to provide information on the character and significance of any below ground archaeological remains that may be revealed within the trial trenches and inspection pits. Should any

significant archaeological deposits be present, then a programme of further mitigation can be formulated and potentially implemented prior to development.

1.2.3 The archaeological works were undertaken in accordance with the Chartered Institute for Archaeologists *Standard and Guidance for Archaeological Watching Briefs* and their codes of conduct (CIfA 2014).

1.3 Report Outline

1.3.1 This report provides a summary and discussion of the archaeological watching brief and its results.

1.4 Illustrations

1.4.1 Printed map extracts are not necessarily reproduced to their original scale. On maps, north is towards the top of the page unless otherwise indicated.

1.5 Timeline

1.5.1 The following timeline (Table 1) is used within this report to give date ranges for the various archaeological periods that may be mentioned within the text.

Table 1: Archaeological and Historical Timeline for Wales.

Period	Approximate date	
Palaeolithic –	*c.*450,000 – 10,000 BC	**Prehistoric**
Mesolithic –	*c.* 10,000 – 4400 BC	
Neolithic –	*c.*4400 – 2300 BC	
Bronze Age –	*c.*2300 – 700 BC	
Iron Age –	*c.*700 BC – AD 43	
Roman (Romano-British) Period –	AD 43 – *c.* AD 410	**Historic**
Post-Roman / Early Medieval Period –	*c.* AD 410 – AD 1086	
Medieval Period –	1086 – 1536	
Post-Medieval Period[1] –	1536 – 1750	
Industrial Period –	1750 – 1899	
Modern –	20th century onwards	

[1] The post-medieval and Industrial periods are combined as the post-medieval period on the Regional Historic Environment Record as held by Dyfed Archaeological Trust

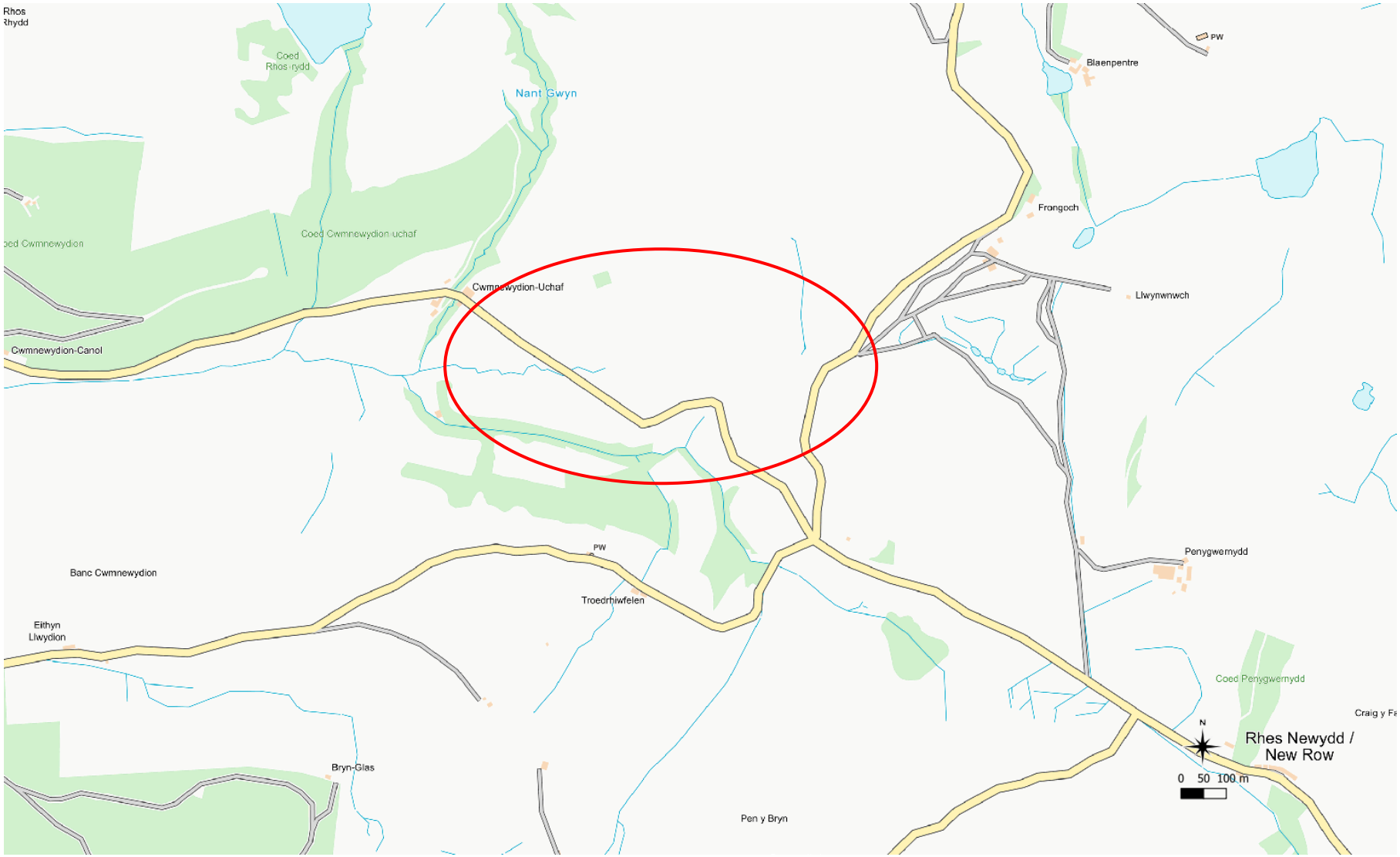

Figure 1: Location of watching brief (circled in red) Map data from OpenStreetMap (OSM) eshttps://www.openstreetmap.org/copyright 24/10/2023..

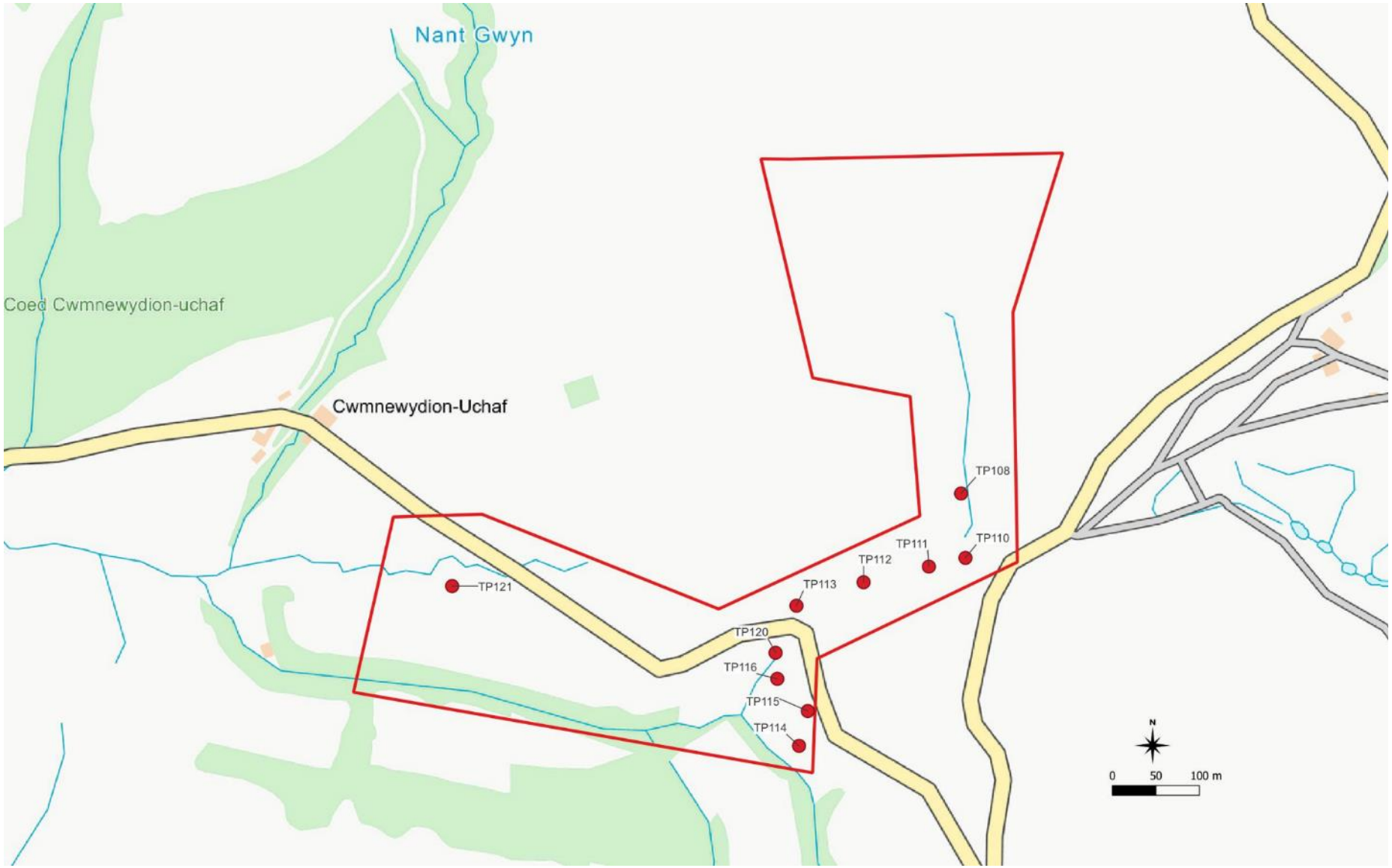

Figure 2: Plan of the ten test pits whose excavation was monitored during the watching brief. Development boundary shown in red.

Map data from OpenStreetMap (OSM) eshttps://www.openstreetmap.org/copyright 24/10/2023.

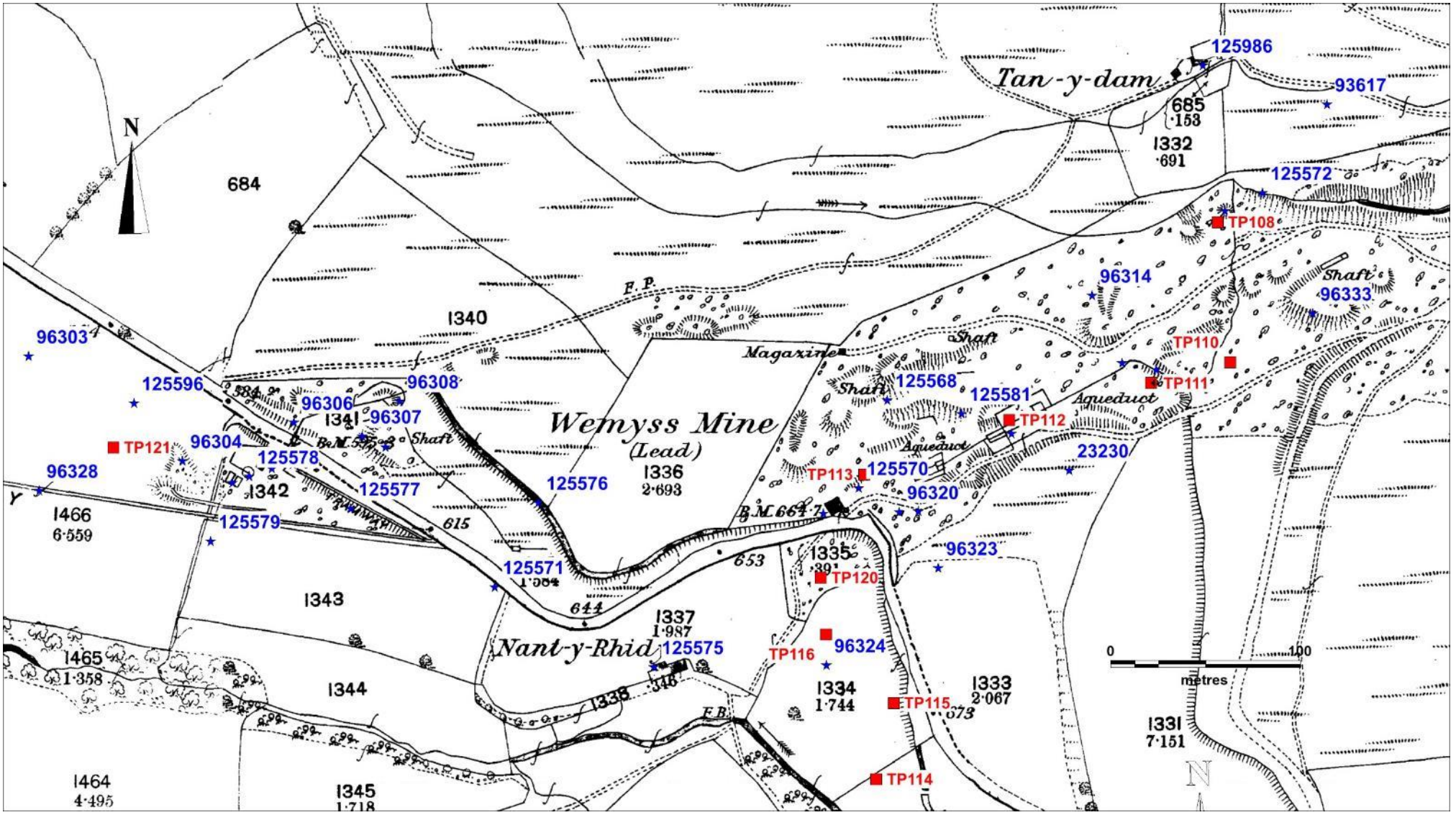

Figure 3: Extract of the OS 1st edition 1:2500 map published in 1905 showing the archaeological sites recorded on the HER within the area of Weymss mine (blue stars), and the locations of the excavated test pits. Sites listed in Table 2.

Table 2: Archaeological assets within the area of Wemyss mine (shown in Figure 3).

PRN	Site Name	Summary	Period	Type	NGR
96307	Wemyss; Lisburne	Coarse tips with much vein stuff (Protheroe-Jones 1993, mine 159, no.7). See PRN 23230 for additional references.	POST MEDIEVAL	Spoil Heap	SN 71328 74226
96333	Frongoch Lead Mine; Lisburne; Llwynwnwch	Development tips protruding from grassy hummocky area (Protheroe-Jones 1993, mine 158, no.6). See PRN 9151 for additional references.	POST MEDIEVAL	Spoil Heap	SN 7183 7428
96334	Frongoch Lead Mine; Lisburne; Llwynwnwch	Boundary shaft: stonewalled collar; blocked with refuse; well preserved balance bob pit to south west with set of steps entering from north (to aid greasing of bearings) (Protheroe-Jones 1993, mine 158, no.7). See PRN 9151 for additional references.	POST MEDIEVAL	Shaft	SN 7183 7428
125596	Frongoch West	Possible stone lined field drain exposed in east facing bank of small watercourse/burst leat now erodiing fine dumps PRN 96304	POST MEDIEVAL	Mine Drainage/ Ventilation Site	SN 71208 74246
125986	Tan-yr-dam	Small farmstead "Tan-Yr-Dam" visible on 1888 25inch OS map.	POST MEDIEVAL	Farmstead	SN 71775 74412
125568	Wemyss	Ruined stone building emerging from eroding spoil tips in the northern area of the site and is level with a trackway runs parallel to its front. Component of Wemyss lead and zinc mine (PRN 23230).	POST MEDIEVAL	Industrial Building	SN 71605 74239
125569	Wemyss	Site of Launder, component of Wemyss Lead and Zinc mine.	POST MEDIEVAL	Metal Industry Site	SN71729 74256
125570	Wemyss	Site of "Office & Workshop" depicted on 1896 Crosswood plan of Wemyss mine; not shown on any other mapping. No visible trace on ground.	POST MEDIEVAL	Mine Office	SN 71589 74193
125571	Wemyss	"Old Lime kiln" identified on 1905 OS map, Structure visible on modern AP.	POST MEDIEVAL	Lime Kiln	SN 71396 74145
125572	Wemyss	Leat northeast of "Glanville's Shaft" running east-west.	POST MEDIEVAL	Leat	SN 71805 74344

PRN	Site Name	Summary	Period	Type	NGR
125573	Wemyss	Remains of "Aqueduct" or leat feeding wheel pit PRN 96318 as depicted on historic OS maps. Earthwork remains still visible.	POST MEDIEVAL	Leat	SN 71747 74252
125574	Wemyss	Possible remains of old trench or shaft. Shown on historic OS maps but not annotated as such.	POST MEDIEVAL	Mine Drainage/ Ventilation Site	SN 71762 74264
125575	Wemyss	Remains of Nant-y-Rhidyll farm house as shown on the 1888 1st edition OS map. Structural remains visible on modern AP	POST MEDIEVAL	Farmhouse	SN 71479 74101
125576	Wemyss	Curvilinear feature shown on 1888 1st edition OS map, 1896 Crosswood plan and 2nd edition 1905 OS map. Also visible as earthwork with bank on southern side with flat bottomed channel. Starts at Adit (PRN 96308) and ends at the Smithy building (PRN 96321).	POST MEDIEVAL	Leat	SN 71420 74189
125577	Wemyss	Narrow gauge tramway shown on 1888 1st edition OS map at Western end of Wemyss site. Disused by 1905 2nd edition OS map. Likely part of PRN 96395	POST MEDIEVAL	Tramway	SN 71321 74188
125578	Wemyss	One possible buddle shown on 1st edition 1888 OS map. Three then shown on 1905 2nd edition OS map. On 1st ed OS, buddle appears to be fed by launder/leat.	POST MEDIEVAL	Buddle	SN 71268 74206
125579	Wemyss	Possible leat or launder shown on 1st edition 1888 OS map feeding possible buddle PRN 125578	POST MEDIEVAL	Launder	SN 71269 74221
125580	Wemyss	Two rectangular structures shown on 1st edition 1888 OS map.	POST MEDIEVAL	Slime Pit	SN 71259 74203
125581	Wemyss	Small "adit" marked on 1896 working plan map.	POST MEDIEVAL	Adit	SN 71644 74231
125582	Wemyss	Wheel pit shown on southern side of road on both 1888 and 1905 1:2500 OS maps. Possible leats and launders connected to it. As part of PRN 96306	POST MEDIEVAL	Wheel Pit	SN 71291 74212

PRN	Site Name	Summary	Period	Type	NGR
23230	Wemyss; Lisburne	The Wemyss mine was a lead and zinc mine which operated in conjunction with Frongoch Mine intermittently from 1861 to 1899. In 1899 a dressing mill was built on the site to process ore from Frongoch Mine. Modernised and provided with electric power from the Pont Ceunant generator house at the end of the 19th century.	POST MEDIEVAL	Lead Mine; Zinc Mine	SN 717 742
93617	Wemyss; Lisburne	Well defined leat (Protheroe-Jones 1993, mine 159, no.18). See PRN 23230 for additional references.	POST MEDIEVAL	Leat	SN 7184 7439
96303	Wemyss; Lisburne	Virtually no trace of waterwheel apart from a brick quoined masonry tailrace culvert just to south at base of vegetated tips (Protheroe-Jones 1993, mine 159, no.3). See PRN 23230 for additional references.	POST MEDIEVAL	Wheel Pit	SN 71153 74272
96304	Wemyss; Lisburne	Fines dumps (Protheroe-Jones 1993, mine 159, no.4). See PRN 23230 for additional references.	POST MEDIEVAL	Spoil Heap	SN 71233 74215
96305	Wemyss; Lisburne	No remains at all of dressing floor (Protheroe-Jones 1993, mine 159, no.5). See PRN 23230 for additional references.	POST MEDIEVAL	Dressing Floor	SN 7128 7421
96306	Wemyss; Lisburne	Bobpit; fairly good condition; no other trace of route of flat rods (Protheroe-Jones 1993, mine 159, no. 6). See PRN 23230 for additional references.	POST MEDIEVAL	Balance Pit	SN 71292 74234
96308	Wemyss; Lisburne	Deep Adit level: rockcut; open; very wet; fairly large (Protheroe-Jones 1993, mine 159, no.8). See PRN 23230 for additional references.	POST MEDIEVAL	Level	SN 71348 74244
96314	Wemyss; Lisburne	Gulley- probable site of level (Protheroe-Jones 1993, mine 159, no.15). See PRN 23230 for additional references.	POST MEDIEVAL	Level	SN 71714 74292
96315	Wemyss; Lisburne	Glanville's Shaft: run in crater; vegetated tip to south (Protheroe-Jones 1993, mine 159, no.16). See PRN 23230 for additional references.	POST MEDIEVAL	Shaft	SN 71785 74335
96318	Wemyss; Lisburne	Large, well-built waterwheel pit; east part much filled by stream washing gravel in. Minimal remains of balance bob pit to east;	POST	Wheel Pit	SN 7167 7422

PRN	Site Name	Summary	Period	Type	NGR
		no trace of structure to west (Protheroe-Jones 1993, mine 159, no.20). See PRN 23230 for additional references.	MEDIEVAL		
96319	Wemyss; Lisburne	Masonry arched entrance, fairly small, to a level. Open (Protheroe-Jones 1993, mine 159, no.21). See PRN 23230 for additional references.	POST MEDIEVAL	Level	SN 71619 74200
96320	Wemyss; Lisburne	Slight remains of water wheel pit although virtually entirely washed away by stream (Protheroe-Jones 1993, mine 159, no.22). See PRN 23230 for additional references.	POST MEDIEVAL	Wheel Pit	SN 71610 74180
96321	Wemyss; Lisburne	Ruined building (Protheroe-Jones 1993, mine 159, no.23). See PRN 23230 for additional references.	POST MEDIEVAL	Building	SN 7157 7418
96322	Wemyss; Lisburne	Mixed coarse and crushed tips (Protheroe-Jones 1993, mine 159, no.24). See PRN 23230 for additional references.	POST MEDIEVAL	Spoil Heap	SN 7162 7418
96323	Wemyss; Lisburne	Well-preserved ruins of dressing mill on 5 levels, great deal of loadings etc. (Protheroe-Jones 1993, mine 159, no.25). See PRN 23230 for additional references.	POST MEDIEVAL	Dressing Mill	SN 7163 7415
96324	Wemyss; Lisburne	Fine dumps - large (Protheroe-Jones 1993, mine 159, no.26). See PRN 23230 for additional references.	POST MEDIEVAL	Spoil Heap	SN 7157 7410
96328	Wemyss; Lisburne	Only trace of route of tramway from West Frongoch (160) mine is hedge bank alignment (Protheroe-Jones 1993, mine 159, no.30). See PRN 23230 for additional references.	POST MEDIEVAL	Tramway	SN 71157 74201
96329	Wemyss; Lisburne	Cratered, run in shaft (Protheroe-Jones 1993, mine 159, no.31). See PRN 23230 for additional references.	POST MEDIEVAL	Shaft	SN 7134 7422

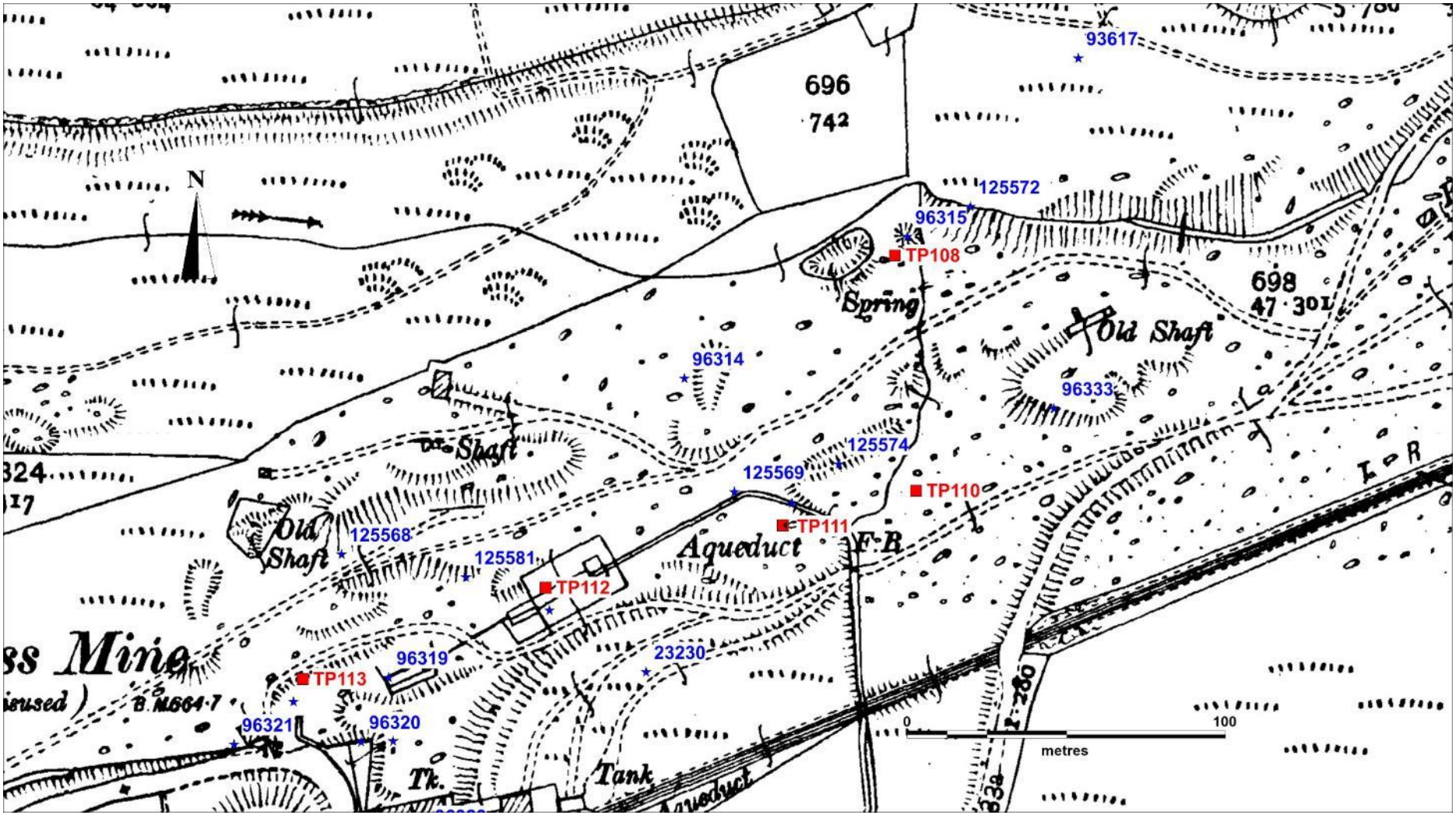

Figure 4: Extract of OS 2nd edition map (1905) showing approximate location of Test Pit Nos 108-113 and HER points in the vicinity.

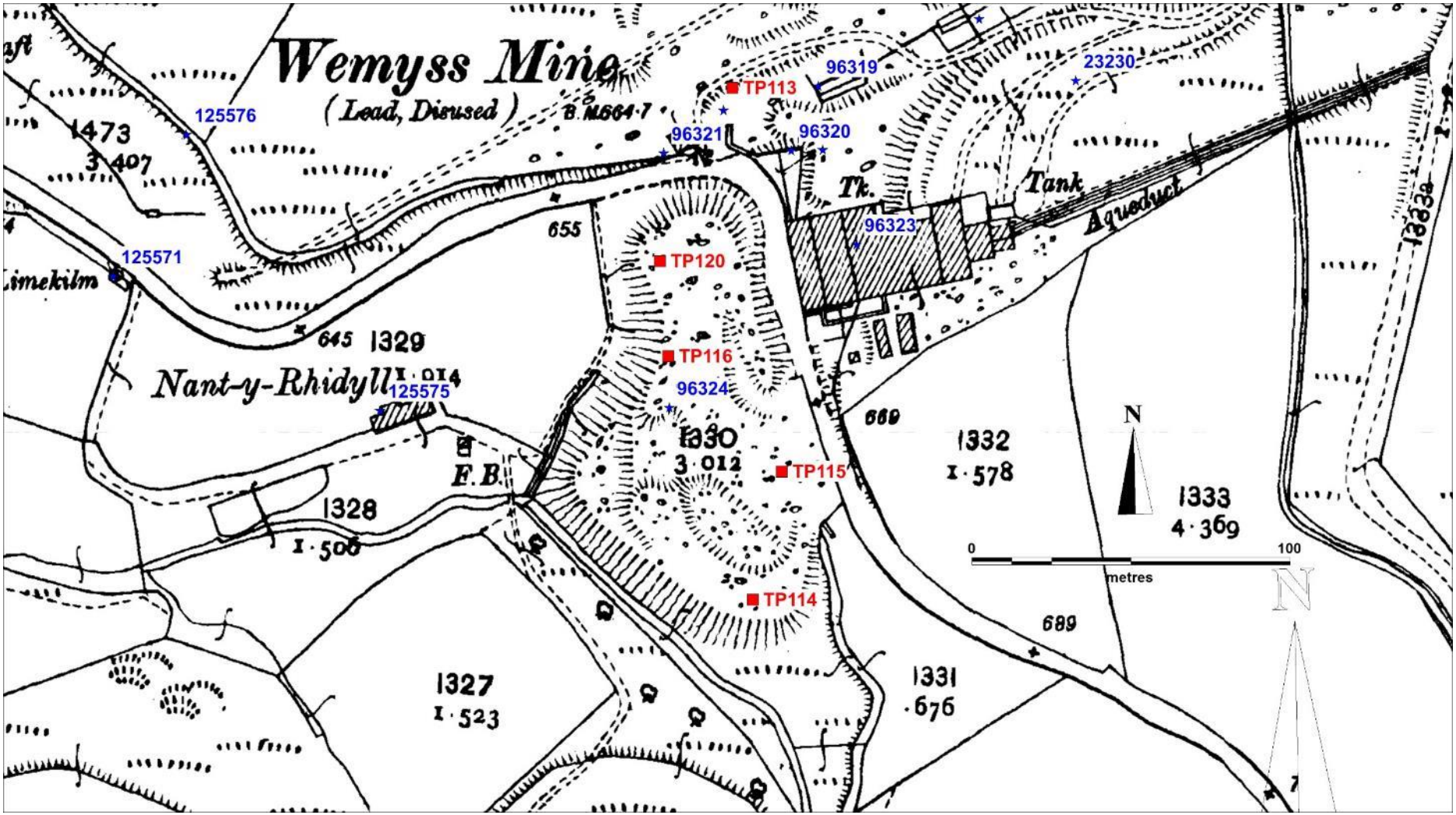

Figure 5: Extract of the OS 2nd edition map (1905) showing approximate locations of excavated Test Pit Nos 113-116 and 120, and HER points in the vicinity.

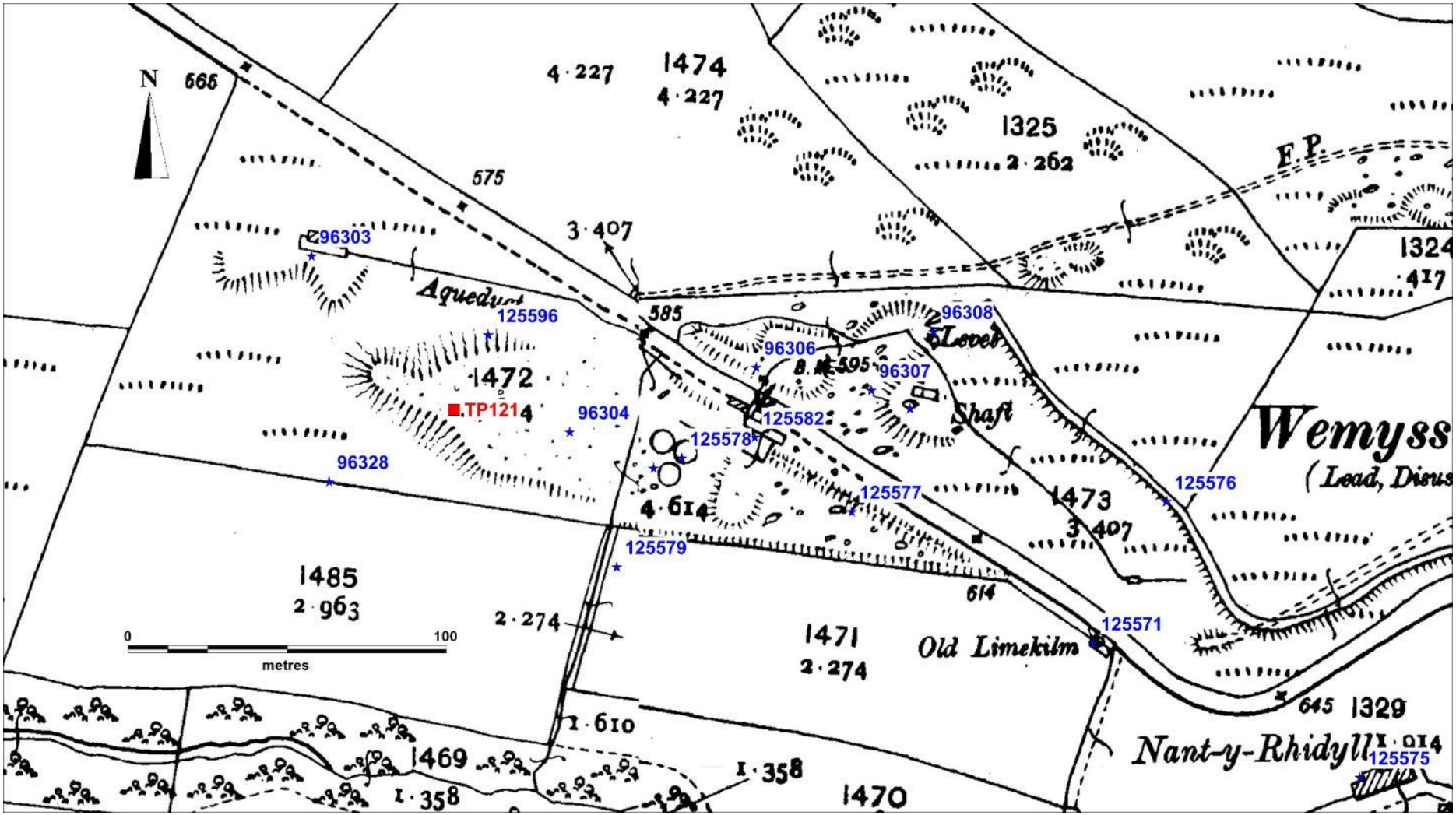

Figure 6: Extract of the OS 2nd edition map (1905) showing approximate locations of excavated Test Pit No 121, and HER points in the vicinity.

2. THE SITE

2.1 Location and Topography

2.1.1 Wemyss former lead and zinc mine occupies the southwest facing slopes of Cwm Newidion valley with a maximum elevation of 295m at its northern extreme and a minimum elevation of 185m beside the banks of Nant Cwm Newidion. The town of Aberystwyth lies 14.6km to the northwest and the village of Pontrhydfendigaid approximately 2.5km to the southeast.

2.1.2 The mine workings are bisected by a minor road that runs from Pontrhydygroes to Abermagwr; to the north of the road are the upstanding remains structures associated with the mine, whilst to the south a large tip of processed waste slopes down to the stream Nant Cwm Newidion (Photo 1).

2.1.3 The underlying solid geology of the site comprises Devil's Bridge Formation; interbedded mudstone and sandstone (British Geological Survey 2020).

Photograph 1: Wemyss Mine spoil tips and former dressing mill.

2.2 Historical Development of Wemyss Mine (after Bell 2020).

2.2.1 Wemyss lead and zinc mine (PRN 23230) is immediately southwest of Frongoch mine (PRN 9151) and is located around 3.5km southwest of Devil's Bridge, Ceredigion. The Frongoch mineral lode ran through both Frongoch and Wemyss mines and was worked independently until 1846 when Wemyss was purchased by John Taylor & Sons Company; owners of Frongoch mine. Thereafter, Wemyss was operated in conjunction with Frongoch until the closure and sale of both mines in 1903.

2.2.2 Shortly after its procurement by John Taylor the Wemyss adit was extended eastwards to serve the Frongoch workings. By 1848 the Wemyss adit had holed through to the Frongoch adit at the 24 fathom level, subsequently becoming the deep ("Frongoch") adit that purportedly extended for 3 miles (Bick, 1986). The *"adit began on the main lode near the road* [northern side presumably]*, but after about 150 fathoms turned northeast for about 25 fathoms before continuing eastwards on a north*

lode which outcrops on surface about 20 fathoms north of Boundary Shaft [at Frongoch]" *(Bick, ibid:14).*

2.2.3 During this period in the mid-nineteenth century the mines were both profitable and productive while the operations continued to exploit deeper levels. In 1863 new dressing floors were constructed at Wemyss to process the ore from Frongoch. Sometime during the 1870s Ball's Shaft, the first of two principal shafts at Wemyss was cut into the lode at 76 fathoms (Bick, *ibid*).

2.2.4 However, by the latter half of the nineteenth century the mines began to struggle as the productivity of the lode began to dwindle. Meanwhile the prices of metal fluctuated against ever increasing working costs. In 1878, the mines made their first loss and the Taylor Company sold their lease of both mines.

2.2.5 In the same year of 1878 the lease was obtained by Messrs Henry Davey and Alexander Kerby of London, and John Kitto from Llanidloes. By all accounts Kitto, a competent and successful mining engineer, was the primary agent and motivator of this venture. It was during the early years of this leasehold that Glanville's Shaft; the second of the principal shafts was cut into the lode. Unlike Ball's shaft, Glanville's Shaft was much shallower at only 16 fathoms (Bick, *ibid*). Kitto was also responsible for the construction of the pit for a 56ft waterwheel (later replaced by a 55ft wheel) at the lower levels of the site which was fed by a circuitous leat that carried water from the dressing floors (Bick, *ibid*). The later 55ft wheel turned a line of flat rods connected to the machinery at Vaughan's New Shaft at Frongoch (Bick, *ibid*).

2.2.6 In 1898 both sites were leased by the Belgian company *"Société Anonyme Minière".* The new lease holders endeavored to modernize the site by constructing a hydro-electric power station at nearby Pont Ceunant to power the machinery and mining operations. The five tiered, stone built dressing mill which now dominates the site, was built in 1899 to process the ore from Frongoch. Built on the side of the slope, each tier was occupied by a machine which was supported by a series of platforms and walls, with the dressing process becoming finer downslope. The mill was fed from material from Vaughan's New Shaft at Frongoch via a chain operated tramway which passed under the road by means of a cutting (Bick, *ibid*).

2.2.7 In spite of such optimistic investments, the venture proved to be ill fated and terminally brief. The metal markets continued to be volatile but were fleetingly favorable between 1898 and 1900. However, full production was not underway until 1902, and even then, the yields paled in comparison to what Kitto had previously achieved in spite of the absence of modern intervention (Bick, *ibid*). It would seem that during this time production at Wemyss was solely focused on processing the waste dumps from Frongoch. The new dressing mills proved to be highly efficient in this task, producing a dump of tailings and fine waste, of monumental proportions which is still visible today.

2.2.8 Full mining operations ceased at Frongoch in June 1903 although the dressing mill at Wemyss continued processing ore until August of the same year. Finally, the mines and machinery were sold at auction to Messrs R.A King & Company in November 1903 (Bick, *ibid*). Thereafter, much of the substantial spoil tips at Frongoch were re-processed during the early twentieth century, whilst Wemyss was left to quietly decay and erode.

3. WATCHING BRIEF METHODOLOGY

3.1 Fieldwork

3.1.1 The watching brief was undertaken in accordance with the Chartered Institute of Archaeologists' (CIfA) *Standard and Guidance for an Archaeological Watching Brief* (2014).

3.1.2 A written scheme of investigation was prepared by DAT Archaeological Services detailing the proposed archaeological works, this is included in Appendix I.

3.1.3 Recording of all archaeological features or deposits conformed to best current professional practice and was carried out in accordance with the Recording Manual[2] used by DAT Archaeological Services. A written, drawn and photographic record was maintained throughout this watching brief. All contexts encountered during this watching brief were recorded.

3.2 Timetabling of Fieldwork

3.2.1 The watching brief took place between March 28th and April 12th, 2023. The weather comprised periods of heavy rain interspersed with drier conditions.

3.3 Post-Fieldwork Reporting and Archiving

3.3.1 All data recovered during the fieldwork will be collated into a site archive structured in accordance with specifications in Archaeological Archives: a guide to best practice in creation, compilation, transfer and curation (Brown 2011), and the procedures recommended by the National Monuments Record, Aberystwyth.

3.3.2 The results of the fieldwork have been assessed in local, regional and wider contexts. The report includes a desk-based research element to ensure that the site is placed within its wider archaeological context.

3.3.3 A report fully representative of the results of the fieldwork has been prepared.

[2] DAT Archaeological Services have adopted the Recording Manual developed by English Heritage Centre for Archaeology. A copy will be available on-site for inspection if required.

Photograph 2: Hand digging the geotechnical test pits in 2023.

4. WATCHING BRIEF RESULTS

4.1 Geotechnical Investigations

4.1.1 Following discussions with the archaeological curator Dyfed Archaeological Trust-Development Management (DAT-DM) it was recommended that an archaeological watching brief should be carried out during the geotechnical investigations, as several of the proposed trial hand dug inspection pits were situated within archaeologically sensitive areas of the mine. However, not all the proposed geotechnical test pits were deemed to lie in archaeologically sensitive areas, and Test Pit Nos 101-107 shown in the drawings within the approved WSI were not monitored during their excavation.

4.1.2 Test Pit No 109 could not be excavated because of the amount of surface water at this location and was abandoned.

4.1.3 Test Pit No 116 was abandoned as the sides of the pit kept collapsing.

4.1.4 Two further test pits, Test Pit Nos 120-121, were excavated in addition to those shown in the WSI.

4.1.5 Test Pit Nos 113 and 115 were excavated by machine. The remaining eight test pits were hand excavated.

4.1.6 Due to the presence of surface water of the vicinity of known mine structures it was necessary to relocate some of the test pits slightly, albeit keeping them as close as possible to their original proposed positions.

4.1.7 Of the ten geotechnical investigations, none revealed archaeological features other than a sequence of accumulated mine-waste or natural deposits.

4.1.8 Below are the results for all 10 geotechnical pits excavated over the course of the groundworks (for individual locations please see Figures 4 to 6).

TP108 (Location shown in Figure 4)

TP108 (0.65m long x 0.3m wide x 0.9m deep) Located south of water filled disused shaft (PRN 96315).		
Context Number	Description	Depth
1003	Made ground and mine waste/tailings.	0.4m
1004	Greyish silty clay gravel with mudstone.	0.9m

Photograph 3: View east: TP108 fully excavated. 1m scale

Photograph 4: View north: showing water filled shaft (PRN 96315). 1m scale

Photograph 5: View northwest: showing water filled shaft (PRN 96315) and TP108 (outlined in red). 1m scale

TP110 (Location shown in Figure 4)

TP110 (0.65m x 0.30m x 0.90m deep) Located east of wheel pit (PRN96318) and south of stream.		
Context Number	Description	Depth
1005	Fine mine tailings.	0.40m
1006	Possible bedrock.	0.90m

Photograph 6: View northwest showing TP110 fully excavated. 1m scale

Photograph 7: View northwest of TP110 fully excavated. 1m scale

TP111 (Location shown in Figure 4)

TP111 (0.6m x 0.3m x 0.2m deep) Located north of stream - the test pit was abandoned due to water ingress.		
Context Number	Description	Depth
1007	Humic topsoil.	0.2m

Photograph 8: View north of TP111 that was abandoned due to water ingress. 1m scale

TP112 (Location shown in Figure 4)

TP112 (0.4m x 0.4m x 0.9m deep) Location moved to north of wheel pit (PRN 96318) to avoid archaeologically sensitive area.		
Context Number	Description	Depth
1008	Mixed medium brown silty/sandy gravelly mixture with broken mudstone.	0.9m

Photograph 9: View northeast of TP112 fully excavated. 1m scale

Photograph 10: View northeast of TP112 during excavation. 1m scale

TP113 (Location shown in Figure 4)

TP113 (3.0m x 2.0m x 3.4m deep) Located northeast of gate into site. Machine excavated.		
Context Number	Description	Depth
1001	Very fine dark grey deposit mine tailings. Tailing filled every depression and crevice with no archaeology.	3.4m depth.

Photograph 11: View west of TP113 fully excavated showing depth of tailings that extended to 3.4m depth, at which point sides of test pit became unstable.

Photograph 12: View southwest showing location of TP113.

TP114 (Location shown in Figure 5)

TP114 (0.6m x 0.6m x 0.4m deep) Located west of road within mine waste spoil heaps (PRN 96324). Abandoned due to collapsing sides.		
Context Number	Description	Depth
1009	Fine mine tailings, collapsed.	0.4m

Photograph 13: View north of TP114 during excavation showing mine tailings collapsed into test pit. 1m scale.

Photograph 14: View north of TP114 during excavation. 1m scale.

TP115 (Location shown in Figure 5)

TP115 (2.5m long x 2m wide x roughly 2.5m deep) Located west of road within mine waste spoil heaps (PRN 96324). Machine excavated.		
Context Number	Description	Depth
1002	Dark brown reddish clay seen towards bottom but tailings collapsing and obscuring bottom. No structures or archaeological deposits recorded.	2.5m

Photograph 15: View south of TP115 during excavation.

Photograph 16: View north of TP115 during excavation.

TP 120 (Location shown in Figure 5)

TP 120 (0.4m x 0.4m x 1.2m deep) Located southwest of road within mine waste spoil heaps (PRN 96324).		
Context Number	Description	Depth
1010	Compacted tailings.	1.2m

Photograph 17: View east of TP120 fully excavated. 1m scale

Photograph 18: View south showing excavation of TP120.

TP 121 (Location shown in Figure 6)

TP 121 (0.4m x 0.4m x 1.2m deep) Located at western end of Wemyss mine complex, south of road within mine waste spoil heap (PRN 96304). .		
Context Number	Description	Depth
1011	Compacted tailings.	1.2m

Photograph 19: View north of TP121 fully excavated. 1m scale

Photograph 20: View northeast showing location of TP121.

5. CONCLUSIONS

5.1 An archaeological watching brief was undertaken during the excavation of ten individual geotechnical pits located within the area of the former Wemyss Metal Mine in Ceredigion.

5.2 Following discussions with the archaeological curator Dyfed Archaeological Trust-Development Management (DAT-DM) it was recommended that an archaeological watching brief was carried out during the ground investigations, as several of the proposed inspection test pits were situated in archaeologically sensitive areas of the mine. The aim of the watching brief was to provide information on the character and significance of any below ground archaeological remains that may be revealed within the inspection pits.

5.3 In some instances, due to the presence of surface water of the vicinity of known mine structures it was necessary to relocate some of the test pits slightly, albeit keeping them as close as possible to their original proposed positions.

5.4 Due to the small dimensions of the investigative pits, and the depth of deposits encountered, it was occasionally difficult to ascertain whether an exposed layer within the trench or pit was natural ground, redeposited natural or mine waste.

5.5 Overall the watching brief has demonstrated that the geotechnical investigations, did not encounter any significant structures or archaeological deposits associated with the former mine. The only semi substantial archaeological deposits were mine tailings and gravelly made ground.

6. SOURCES

Cartographic

1888 - First edition Ordnance Survey 25-inch map of Cardiganshire.

1905 – Second edition Ordnance Survey 25-inch map of Cardiganshire

Un-Published

Bell, M, Meek, J and Murphy, F, 2016, *Metal Mine Remediation Project Part 3: Wemyss Archaeological Assessment*, DAT Unpublished Report No 2016/05 (Part 3)

Bell, M, 2020, *Wemyss Metal Mine Archaeological Desk-Based Assessment Update,* DAT Unpublished Report No 2020/55

Database

Dyfed Archaeological Trust Historic Environment Record, housed with Dyfed Archaeological Trust in The Corner House, 6 Carmarthen Street, Llandeilo, Carmarthenshire, SA19 6AE.

Websites

British Geological Survey mapping portal. Accessed on the 16/02/21

APPENDIX I :

WEMYSS MINES

SURFACE WATER AND SPOIL MANAGEMENT PROJECT

WRITTEN SCHEME OF INVESTIGATION

FOR ARCHAEOLOGICAL WATCHING BRIEF

1 INTRODUCTION

1.1 This written scheme of investigation (WSI) has been prepared by DAT Archaeological Services (the contracting arm of Dyfed Archaeological Trust) to provide a methodology for an archaeological watching brief at Wemyss Mine, near Pont-rhyd-y-groes, Ceredigion (centred on NGR SN71579 74089; Figure 1, Photos 1 & 2).

1.2 The watching brief will be undertaken during groundworks associated with remediation necessary for surface water and spoil management in an area with extensive remains of former lead and zinc mining.

1.3 Investigations on behalf of Natural Resources Wales have revealed that over 2 tonnes of harmful metals enter the Nant Cwmnewydion and the Ystwyth annually. Their report states that,

The mine is contributing to the Cwmnewydion, Magwr and Ystwyth failing to achieve the environmental quality standards for zinc, lead and cadmium required by the European Water Framework Directive (WFD). Fish population surveys carried out on the Cwmnewydion in 2009 showed the stream to be virtually fishless downstream of the mine to its confluence with the Magwr (NRW 2016).

1.4 A remediation project led by Natural Resources Wales aims to reduce and prevent the current extent of metal discharge from the site.

1.5 The main elements of the mine water capture construction are:

- Creation of an upper earth bund to enable the formation of an upper pond. This is required to maximise the amount of retention of 'clean water' as part of the natural catchment which will regulate water flow down the hillside, and to reduce the requirement for harder engineering solutions downstream.
- Creation of main lined channel. This channel will originate from the upper pond and will flow along a similar trajectory to the existing Upper Mill Race Stream, and through the footprint of the principal Wemyss mine area which includes the remnant wheel pit and structures. The channel will pass beneath a culvert below the road and into a field where it will then discharge into the Nant Cwmnewydion. The primary purpose of this channel is to remove the interface between water at the top of the catchment (captured and retained at the upper pond) and the mining spoil associated with the Wemyss

mine area, allowing for 'clean water' to directly discharge to the Nant Cwmnewydion.

- Creation of a series of filter drains that will capture 'dirty water' from the catchment that has had contact with mining spoil. These filter drains will discharge into a separate channel, which will subsequently flow into the Nant Cwmnewydion without treatment (although the overall volume of 'dirty water' entering the catchment will have been reduced).
- Slope stability of existing spoil tips associated with the 'Main Spoil' and the 'Frongoch Spoil'.

1.6 A programme of intrusive geotechnical investigation, including test pitting, is required prior to these works commencing (Figure 2). Figures 3–4 show the proposed locations of test pits overlying an extract of the 1st edition OS 1:2500 map published in 1888. Figure 5 shows the test pit locations in relation to known mining features recorded in the Historic Environment Record, the details of which are listed in Table 1.

1.7 The site of Wemyss Mine has been subject to a Historic Environment Desk-Based Assessment that included a walkover survey (Bell et al. 2016; Bell 2020). This noted that the surface archaeology at the site is in relatively good condition and identified the presence of several archaeological constraint areas within the proposed development area. Figure 6 shows the locations of the proposed test pits in relation to archaeological constraint areas identified by Bell.

1.8 A watching brief conducted in 2022 confirmed that archaeological features relating to mining activity also survived below ground across the site (Jones 2022).

1.9 The aim of the monitoring through an archaeological watching brief or targeted recording during works is to provide information on the character and significance of any below ground archaeological remains that may be revealed during the enabling works. Should any significant archaeological deposits be revealed, then a programme of further mitigation can be formulated and potentially implemented prior to or during development.

1.10 This written scheme of investigation (WSI) details the methodology of the watching brief which will be undertaken by DAT Archaeological Services and has been prepared in accordance with the Chartered Institute for Archaeologists (CIfA) Standard and guidance for an archaeological watching brief (CIfA 2014, revised 2020). A copy will be sent to the archaeological advisors to the local planning authority for their approval.

1.11 DAT Archaeological Services has considerable experience of this type of project and always operates to best professional practice. DAT Archaeological Services has its own Health and Safety Policy, and all works are covered by appropriate Employer's Liability and Public Liability Insurances. Copies of all are available on request.

1.12 **Dyfed Archaeological Trust is a CIfA Registered Organisation, and all permanent staff are CSCS registered**

Photo 1: View showing the remains of former mine buildings and tips at Wemyss © DAT

Photo 2: Aerial photograph of Wemyss Mine taken in 1992 © DAT

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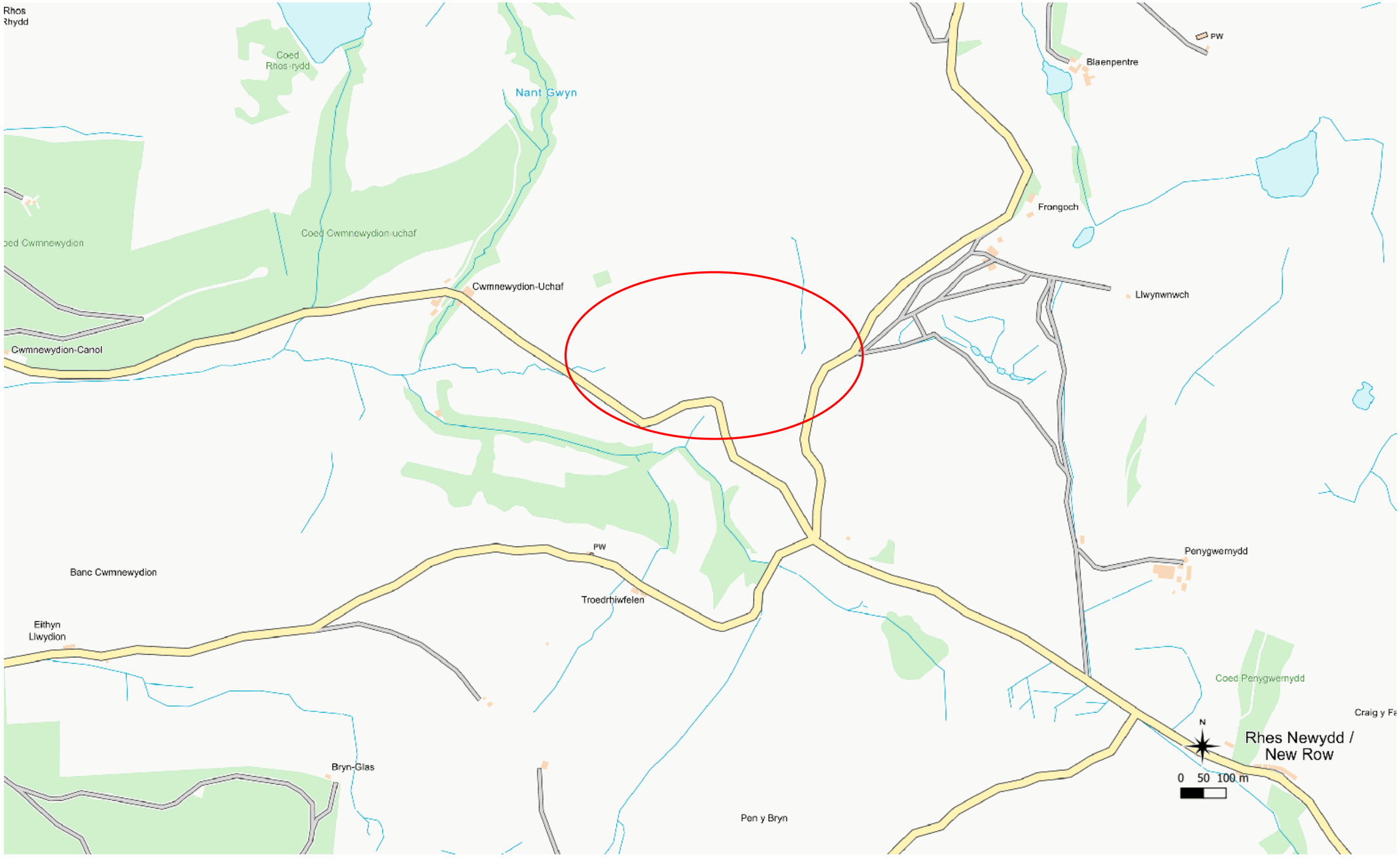

Figure 1: Location of watching brief (circled in red) Map data from OpenStreetMap (OSM) eshttps://www.openstreetmap.org/copyright 24/10/2023..

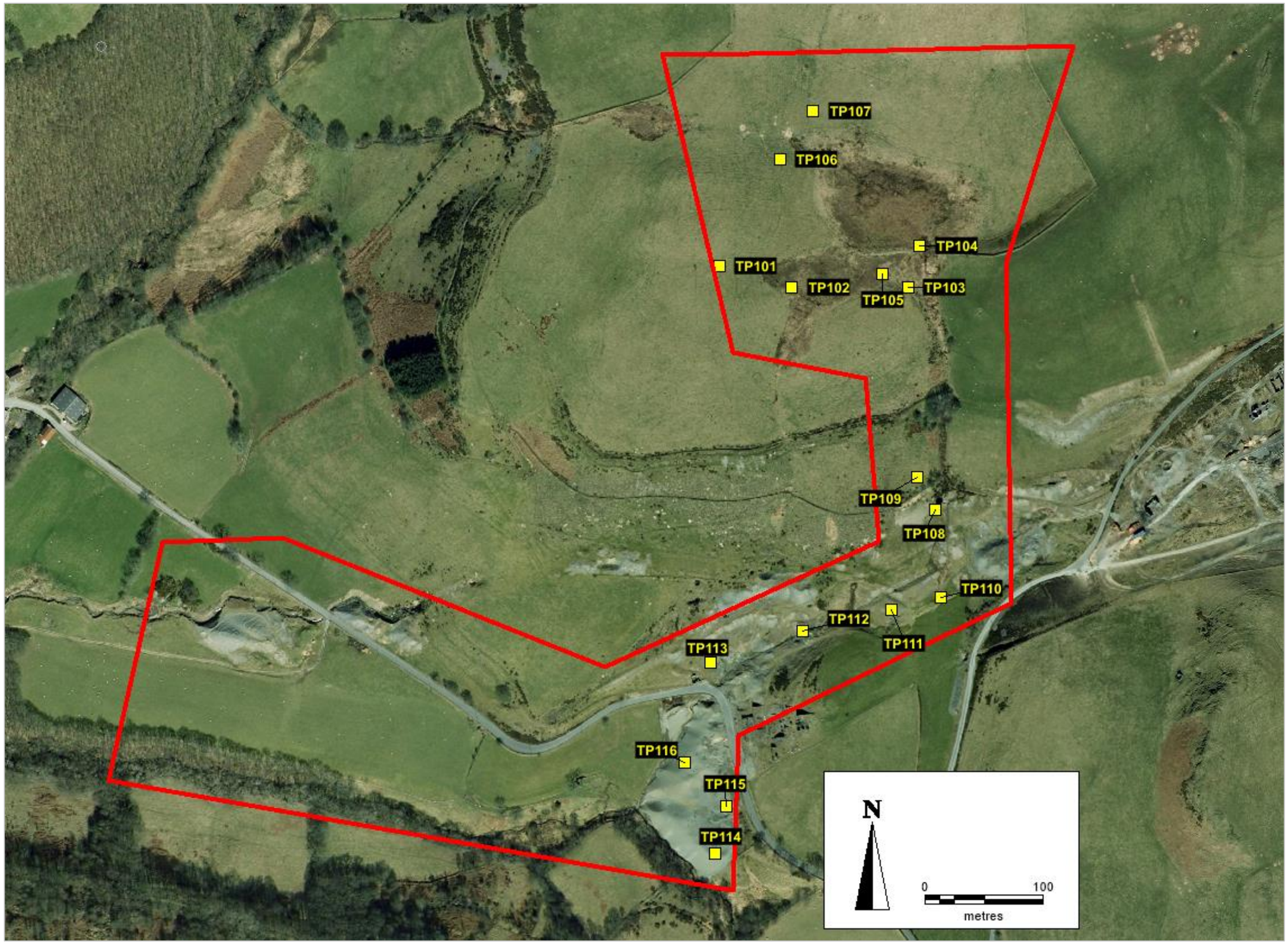

Figure 2: Showing the extent of the works and proposed locations of test pits mapped over satellite imagery – boundary and test pit locations supplied by client.

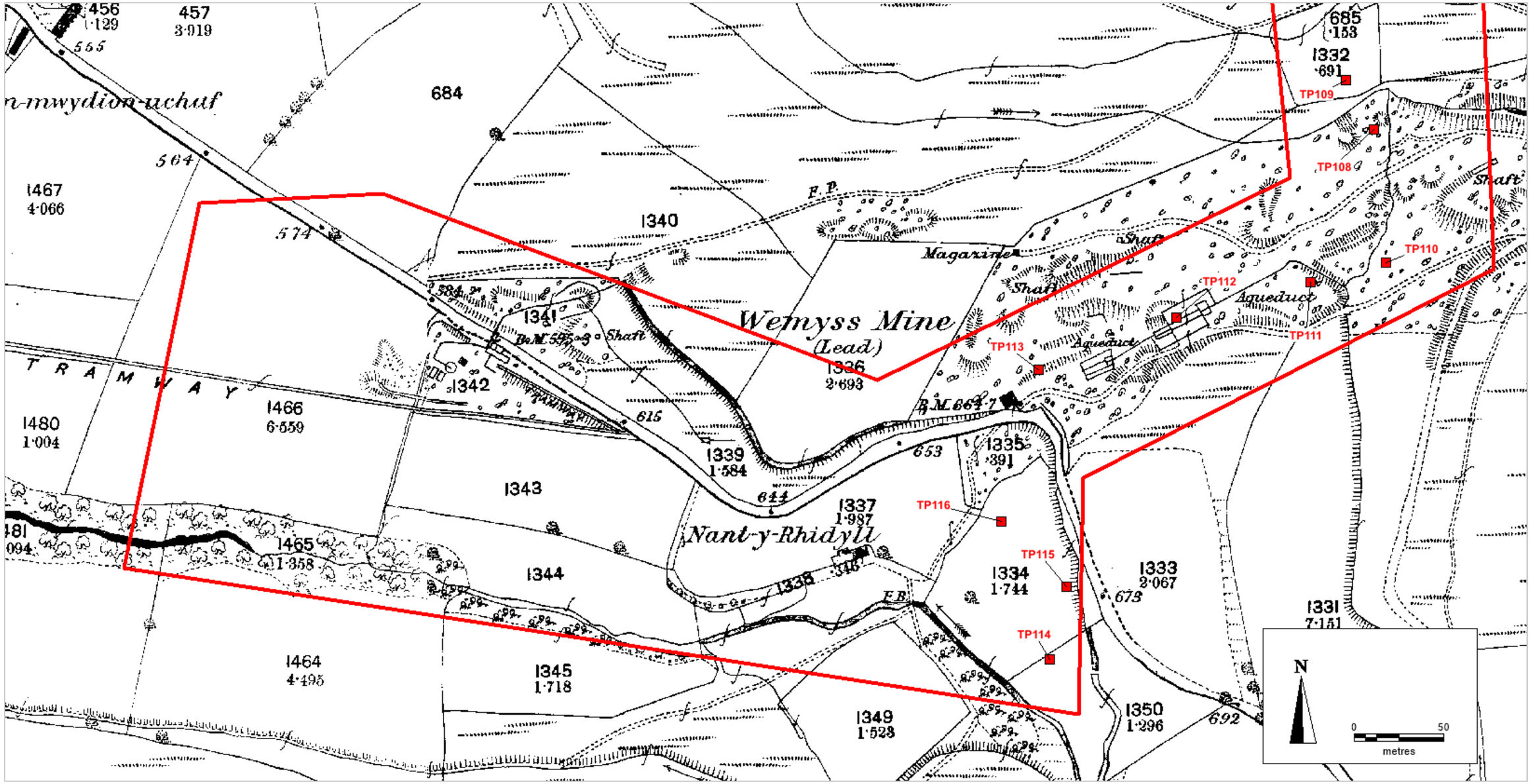

Figure 3: The southern test pit locations (red squares) overlying an extract of the 1st edition 25" Ordnance Survey map published in 1888.

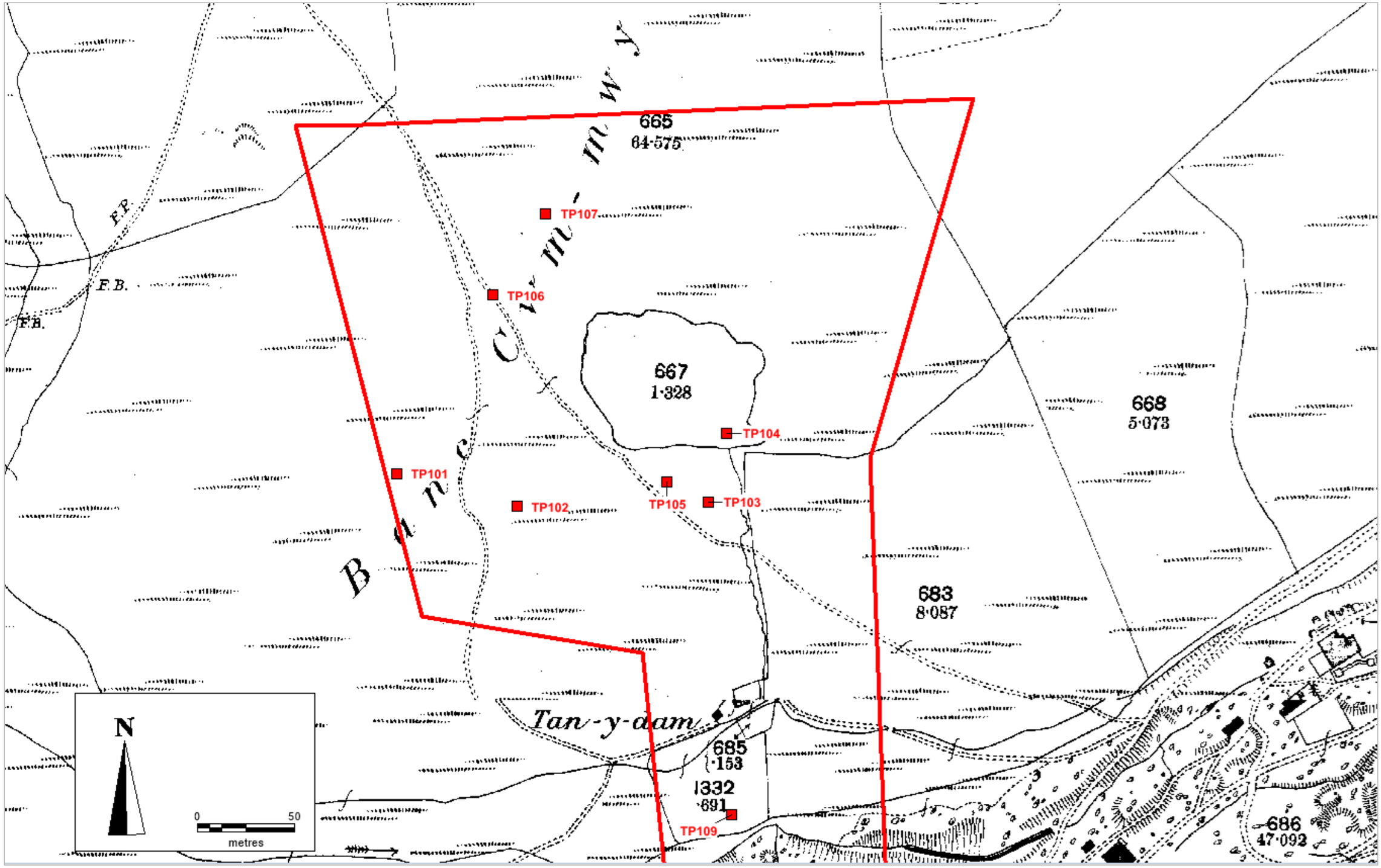

Figure 4: The northern test pit locations (red squares) overlying an extract of the 1st edition 25" Ordnance Survey map published in 1888.

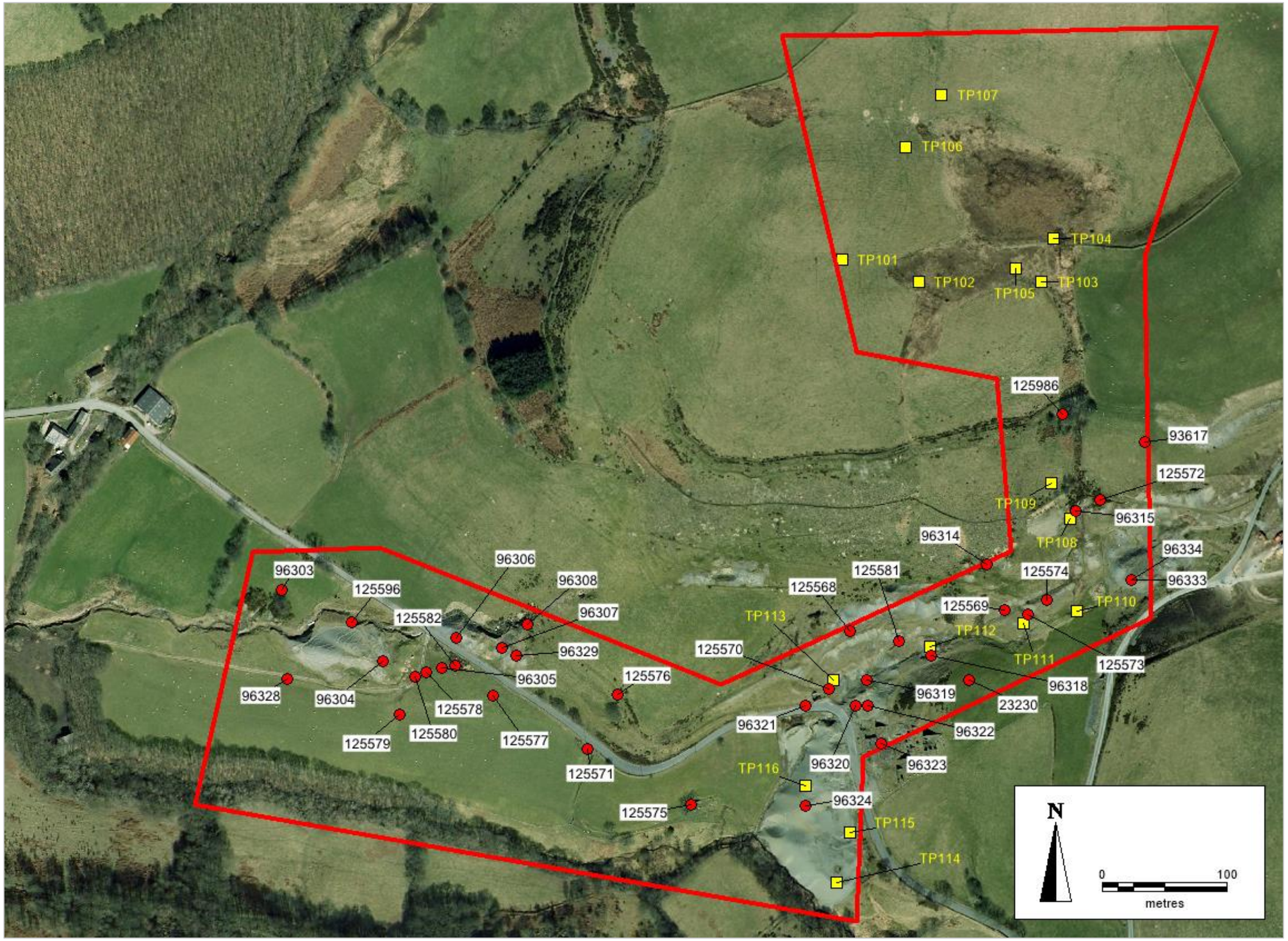

Figure 5: Showing the test pit locations (yellow squares) in relation to known mining features recorded in the HER (red dots). See Table 1 for details of these features.

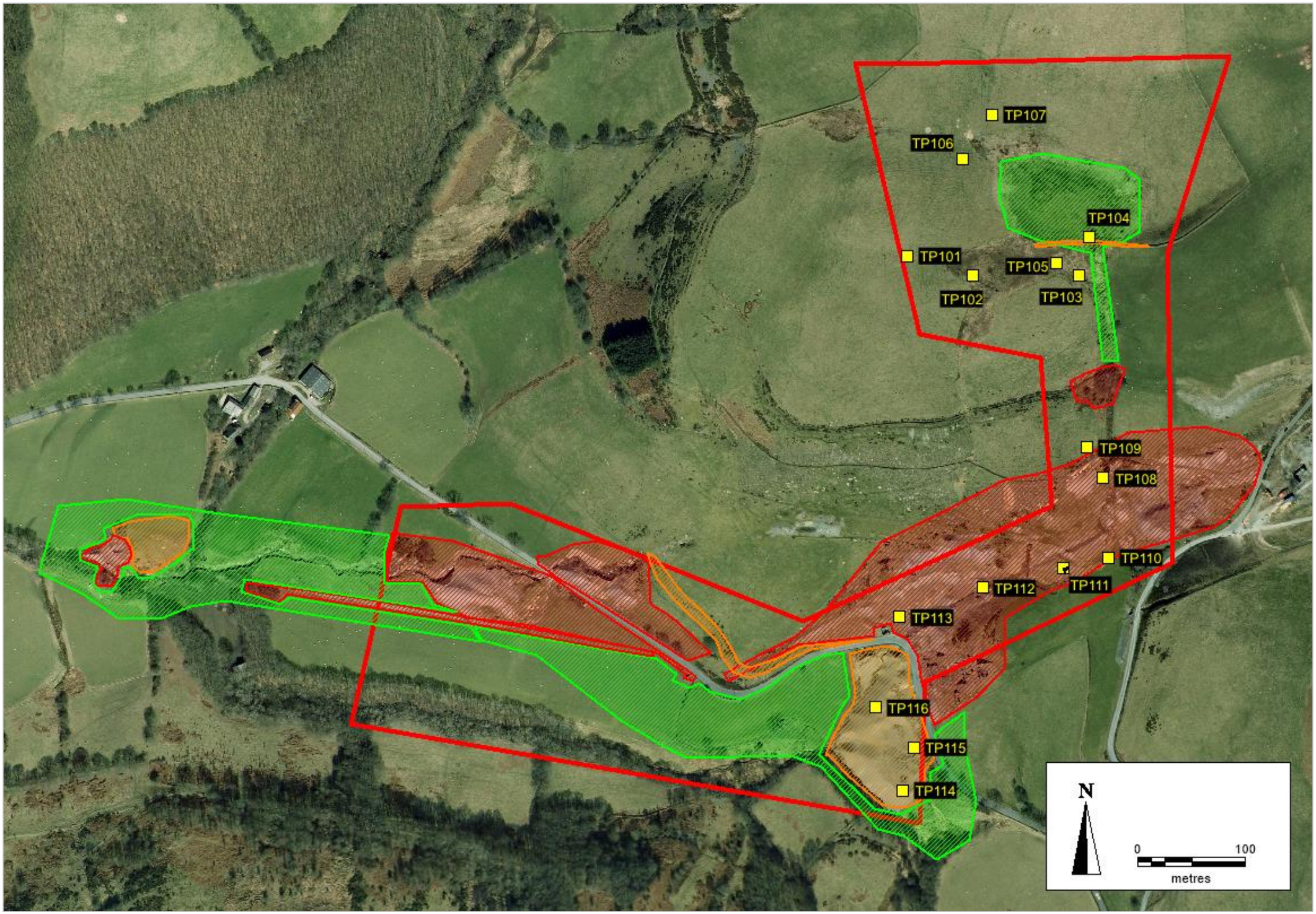

Figure 6: Showing the locations of proposed test pits in relation to archaeological constraint areas identified by Bell (2020, Figure 15) Red= high potential, Orange = medium potential, Green = low potential.

Table 1: Details of mining features recorded in the HER within the area of proposed remediation works.

PRN	Site Name	Summary	Period	Type	NGR
96307	Wemyss; Lisburne	Coarse tips with much vein stuff (Protheroe-Jones 1993, mine 159, no.7). See PRN 23230 for additional references.	POST MEDIEVAL	Spoil Heap	SN 71328 74226
96333	Frongoch Lead Mine; Lisburne; Llwynwnwch	Development tips protruding from grassy hummocky area (Protheroe-Jones 1993, mine 158, no.6). See PRN 9151 for additional references.	POST MEDIEVAL	Spoil Heap	SN 7183 7428
96334	Frongoch Lead Mine; Lisburne; Llwynwnwch	Boundary shaft: stonewalled collar; blocked with refuse; well preserved balance bob pit to south west with set of steps entering from north (to aid greasing of bearings) (Protheroe-Jones 1993, mine 158, no.7). See PRN 9151 for additional references.	POST MEDIEVAL	Shaft	SN 7183 7428
125596	Frongoch West	Possible stone lined field drain exposed in east facing bank of small watercourse/burst leat now erodiing fine dumps PRN 96304	POST MEDIEVAL	Mine Drainage/ Ventilation Site	SN 71208 74246
125986	Tan-yr-dam	Small farmstead "Tan-Yr-Dam" visible on 1888 25inch OS map.	POST MEDIEVAL	Farmstead	SN 71775 74412
125568	Wemyss	Ruined stone building emerging from eroding spoil tips in the northern area of the site and is level with a trackway runs parallel to its front. Component of Wemyss lead and zinc mine (PRN 23230).	POST MEDIEVAL	Industrial Building	SN 71605 74239
125569	Wemyss	Site of Launder, component of Wemyss Lead and Zinc mine.	POST MEDIEVAL	Metal Industry Site	SN71729 74256
125570	Wemyss	Site of "Office & Workshop" depicted on 1896 Crosswood plan of Wemyss mine; not shown on any other mapping. No visible trace on ground.	POST MEDIEVAL	Mine Office	SN 71589 74193
125571	Wemyss	"Old Lime kiln" identified on 1905 OS map, Structure visible on modern AP.	POST MEDIEVAL	Lime Kiln	SN 71396 74145
125572	Wemyss	Leat northeast of "Glanville's Shaft" running east-west.	POST MEDIEVAL	Leat	SN 71805 74344

PRN	Site Name	Summary	Period	Type	NGR
125573	Wemyss	Remains of "Aqueduct" or leat feeding wheel pit PRN 96318 as depicted on historic OS maps. Earthwork remains still visible.	POST MEDIEVAL	Leat	SN 71747 74252
125574	Wemyss	Possible remains of old trench or shaft. Shown on historic OS maps but not annotated as such.	POST MEDIEVAL	Mine Drainage/ Ventilation Site	SN 71762 74264
125575	Wemyss	Remains of Nant-y-Rhidyll farm house as shown on the 1888 1st edition OS map. Structural remains visible on modern AP	POST MEDIEVAL	Farmhouse	SN 71479 74101
125576	Wemyss	Curvilinear feature shown on 1888 1st edition OS map, 1896 Crosswood plan and 2nd edition 1905 OS map. Also visible as earthwork with bank on southern side with flat bottomed channel. Starts at Adit (PRN 96308) and ends at the Smithy building (PRN 96321).	POST MEDIEVAL	Leat	SN 71420 74189
125577	Wemyss	Narrow gauge tramway shown on 1888 1st edition OS map at Western end of Wemyss site. Disused by 1905 2nd edition OS map. Likely part of PRN 96395	POST MEDIEVAL	Tramway	SN 71321 74188
125578	Wemyss	One possible buddle shown on 1st edition 1888 OS map. Three then shown on 1905 2nd edition OS map. On 1st ed OS, buddle appears to be fed by launder/leat.	POST MEDIEVAL	Buddle	SN 71268 74206
125579	Wemyss	Possible leat or launder shown on 1st edition 1888 OS map feeding possible buddle PRN 125578	POST MEDIEVAL	Launder	SN 71269 74221
125580	Wemyss	Two rectangular structures shown on 1st edition 1888 OS map.	POST MEDIEVAL	Slime Pit	SN 71259 74203
125581	Wemyss	Small "adit" marked on 1896 working plan map.	POST MEDIEVAL	Adit	SN 71644 74231
125582	Wemyss	Wheel pit shown on southern side of road on both 1888 and 1905 1:2500 OS maps. Possible leats and launders connected to it. As part of PRN 96306	POST MEDIEVAL	Wheel Pit	SN 71291 74212

PRN	Site Name	Summary	Period	Type	NGR
23230	Wemyss; Lisburne	The Wemyss mine was a lead and zinc mine which operated in conjunction with Frongoch Mine intermittently from 1861 to 1899. In 1899 a dressing mill was built on the site to process ore from Frongoch Mine. Modernised and provided with electric power from the Pont Ceunant generator house at the end of the 19th century.	POST MEDIEVAL	Lead Mine; Zinc Mine	SN 717 742
93617	Wemyss; Lisburne	Well defined leat (Protheroe-Jones 1993, mine 159, no.18). See PRN 23230 for additional references.	POST MEDIEVAL	Leat	SN 7184 7439
96303	Wemyss; Lisburne	Virtually no trace of waterwheel apart from a brick quoined masonry tailrace culvert just to south at base of vegetated tips (Protheroe-Jones 1993, mine 159, no.3). See PRN 23230 for additional references.	POST MEDIEVAL	Wheel Pit	SN 71153 74272
96304	Wemyss; Lisburne	Fines dumps (Protheroe-Jones 1993, mine 159, no.4). See PRN 23230 for additional references.	POST MEDIEVAL	Spoil Heap	SN 71233 74215
96305	Wemyss; Lisburne	No remains at all of dressing floor (Protheroe-Jones 1993, mine 159, no.5). See PRN 23230 for additional references.	POST MEDIEVAL	Dressing Floor	SN 7128 7421
96306	Wemyss; Lisburne	Bobpit; fairly good condition; no other trace of route of flat rods (Protheroe-Jones 1993, mine 159, no. 6). See PRN 23230 for additional references.	POST MEDIEVAL	Balance Pit	SN 71292 74234
96308	Wemyss; Lisburne	Deep Adit level: rockcut; open; very wet; fairly large (Protheroe-Jones 1993, mine 159, no.8). See PRN 23230 for additional references.	POST MEDIEVAL	Level	SN 71348 74244
96314	Wemyss; Lisburne	Gulley- probable site of level (Protheroe-Jones 1993, mine 159, no.15). See PRN 23230 for additional references.	POST MEDIEVAL	Level	SN 71714 74292
96315	Wemyss; Lisburne	Glanville's Shaft: run in crater; vegetated tip to south (Protheroe-Jones 1993, mine 159, no.16). See PRN 23230 for additional references.	POST MEDIEVAL	Shaft	SN 71785 74335
96318	Wemyss; Lisburne	Large, well-built waterwheel pit; east part much filled by stream washing gravel in. Minimal remains of balance bob pit to east;	POST	Wheel Pit	SN 7167 7422

PRN	Site Name	Summary	Period	Type	NGR
		no trace of structure to west (Protheroe-Jones 1993, mine 159, no.20). See PRN 23230 for additional references.	MEDIEVAL		
96319	Wemyss; Lisburne	Masonry arched entrance, fairly small, to a level. Open (Protheroe-Jones 1993, mine 159, no.21). See PRN 23230 for additional references.	POST MEDIEVAL	Level	SN 71619 74200
96320	Wemyss; Lisburne	Slight remains of water wheel pit although virtually entirely washed away by stream (Protheroe-Jones 1993, mine 159, no.22). See PRN 23230 for additional references.	POST MEDIEVAL	Wheel Pit	SN 71610 74180
96321	Wemyss; Lisburne	Ruined building (Protheroe-Jones 1993, mine 159, no.23). See PRN 23230 for additional references.	POST MEDIEVAL	Building	SN 7157 7418
96322	Wemyss; Lisburne	Mixed coarse and crushed tips (Protheroe-Jones 1993, mine 159, no.24). See PRN 23230 for additional references.	POST MEDIEVAL	Spoil Heap	SN 7162 7418
96323	Wemyss; Lisburne	Well-preserved ruins of dressing mill on 5 levels, great deal of loadings etc. (Protheroe-Jones 1993, mine 159, no.25). See PRN 23230 for additional references.	POST MEDIEVAL	Dressing Mill	SN 7163 7415
96324	Wemyss; Lisburne	Fine dumps - large (Protheroe-Jones 1993, mine 159, no.26). See PRN 23230 for additional references.	POST MEDIEVAL	Spoil Heap	SN 7157 7410
96328	Wemyss; Lisburne	Only trace of route of tramway from West Frongoch (160) mine is hedge bank alignment (Protheroe-Jones 1993, mine 159, no.30). See PRN 23230 for additional references.	POST MEDIEVAL	Tramway	SN 71157 74201
96329	Wemyss; Lisburne	Cratered, run in shaft (Protheroe-Jones 1993, mine 159, no.31). See PRN 23230 for additional references.	POST MEDIEVAL	Shaft	SN 7134 7422

2. SITE LOCATION

2.1. Wemyss former lead and zinc mine is situated between 190m and 260m above sea level in an extensive area of upland moorland in the county of Ceredigion (Figure 1). The nearest settlement is the village of Pont-rhyd-y-groes 2.5km to the south-east. The County Town of Aberystwyth is approximately 15km to the north-west.

2.2. The mine workings are bisected by a minor road that runs between Pontrhydygroes and Abermagwr. The ruinous mine buildings are to the north of this road and the spoil tips are to the south, above the valley of the Nant Cwmnewydion, a tributary of the River Ystwyth.

2.3. The scheduled site of Frongoch metal mine (CD146; PRN 9151) lies approximately 200m north-east of Wemyss Mine.

3. HISTORICAL BACKGROUND

3.1. Wemyss Mine lies in the Upland Ceredigion Landscape of Historic Interest which at 468 square kilometres, is the largest landscape on the Register of Landscapes of Outstanding Historic Interest in Wales. The silver and lead mining industry, whose period of most intense operation spanned the late nineteenth and early twentieth centuries, has left an indelible impression upon this landscape, with abandoned mines and spoil tips. Many communities, such as nearby Pontrhyfendigaid, developed to serve the lead metal mining industry.

3.2. The history of Wemyss Mine is provided in detail in the desk-based assessment update (Bell 2020) from which the following brief summary is compiled.

The mineral lode that ran through both Frongoch and Wemyss mines was worked independently until 1846, when Wemyss was purchased by the owners of Frongoch mine. Thereafter, Wemyss was operated in conjunction with Frongoch until the closure and sale of both mines in 1903. During the mid-nineteenth century the mines were both profitable and productive while operations continued to exploit deeper levels. In 1863, new dressing floors were constructed at Wemyss to process the ore from Frongoch. However, by the latter half of the nineteenth-century the mines began to struggle. In spite of optimistic investments, yields paled in comparison to what had previously been achieved. Full mining operations ceased at Frongoch in June 1903 although the dressing mill at Wemyss continued processing ore until August of the same year. Finally, the mines and machinery were sold at auction in November 1903 (Bick 1986). Thereafter, Wemyss was left to quietly decay (Bell 2020, 13–14).

4. WATCHING BRIEF

5.1 The definition of archaeological watching brief, taken from the Chartered Institute for Archaeologists' *Standard and Guidance for an archaeological watching brief* (CIfA 2014) is a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.

5.2 The purpose of a watching brief, as defined by CIfA (2014) is:

to allow, within the resources available, the preservation by record of archaeological deposits, the presence and nature of which could not be established (or established with sufficient accuracy) in advance of development or other potentially disruptive works;

to provide an opportunity, if needed, for the watching archaeologist to signal to all interested parties, before the destruction of the material in question, that an archaeological find has been made for which the resources allocated to the watching brief itself are not sufficient to support treatment.

5.3 This document provides a scheme of works for:

Archaeological attendance and recording during ground works associated with remediation necessary for surface water and spoil management at the former Wemyss metal mine, Ceredigion.

4.4 The following tasks will be completed:

- To follow this approved Written Scheme of Investigation.
- To monitor ground works in order to identify the presence/absence of any archaeological deposits
- To establish, where possible, the state of preservation, character, extent and date range for any archaeological deposits disturbed
- Appropriate investigation and recording of any significant archaeological remains will be undertaken if revealed
- Production of a report and an archive of the results

5. WATCHING BRIEF METHODOLOGY

3.1 The watching brief will entail an archaeologist being present during all ground works where there is a potential for archaeological remains to be exposed, damaged or destroyed. This will include but not be limited to the excavation of trenches and pits.

3.2 It is essential that coordination between the site contractors and archaeologist is established at the outset to avoid any potential disturbance to the site without an archaeologist being present, or unnecessary visits to the site when works are being carried out that do not require the presence of an archaeologist.

3.3 Adequate time must be made available to the visiting archaeologist to ensure that appropriate recording can be undertaken of any archaeological features or deposits exposed during ground works.

3.4 Recording of all archaeological features or deposits will conform to best current professional practice and be carried out in accordance with the Recording Manual[3] used

[3] ***DAT Archaeological Services has adopted the Recording Manual developed by English Heritage Centre for Archaeology. A copy will be available on-site for inspection if required.***

by DAT Archaeological Services. Significant archaeological features or deposits will be drawn at a suitable scale (no less than 1:20) and photographed in an appropriate format.

3.5 All archaeologically significant finds will be retained and, where possible, related to the contexts from which they derived. Finds will be temporarily stored by DAT Archaeological Services in stable conditions. All finds, except those deemed to be Treasure Trove, will remain the property of the landowner. It is assumed that permission will be granted for any finds recovered to be stored within the site archive for the project or within a local museum or other suitable repository.

3.6 Under the 1996 Treasure Act, "Treasure" is defined as:

- Any object other than a coin containing at least 10% gold or silver and at least 300 years old;
- Any prehistoric assemblage of base metal;
- Coins found together which contain 10% gold or silver (but no single coins) and groups of at least 10 coins of other metals, provided they are at least 300 years old;
- Any object found associated with treasure except unworked natural objects; and
- Any object which would have been Treasure Trove before the 1996 Act but not covered above.

5.7 In the event that unforeseen archaeological discoveries are made during the development, or that archaeological remains of high significance are exposed, DAT Archaeological Services shall have the power to halt any ground works and shall inform the site agent/project manager and the curatorial officer and prepare a written statement with plan detailing the archaeological evidence. Following assessment of the archaeological remains by the curatorial officer, DAT Archaeological Services shall, if required, implement on behalf of the Client a contingency scheme for salvage excavation of affected archaeological features. In these instances, it would be necessary to employ extra resources to record such features to an appropriate standard.

5.8 In the very unlikely event that human remains are encountered, the District Coroner's Office and the Police will be notified immediately. All human remains will, where possible, be left *in situ*. If preservation *in situ* is not possible all statutory permissions will be obtained in writing before removal begins.

6 POST-FIELDWORK REPORTING AND ARCHIVING

6.1 Following the completion of all phases of fieldwork an archive will be prepared if it meets the requirements of the Dyfed Archaeological Trust archive retention policy (2018). If it does, then data recovered during the watching brief will be collated into a site archive structured in accordance with the specifications in Archaeological Archives: a guide to best practice in creation, compilation, transfer and curation (Brown 2011), and the procedures recommended by the National Monuments Record, Aberystwyth.

6.2 A Data Management Plan (DMP) (Appendix I) for this project has been produced in accordance with the Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives (Chartered Institute for Archaeologists 2014, updated 2020).

6.3 The National Standards for Wales for Collecting and Depositing Archaeological Archives produced by the Federation of Museums and Art Galleries of Wales will also be adhered to. Digital archives will be collated using the Royal Commission on the Ancient and Historical Monuments of Wales systems (2015) and deposited with the RCAHMW. The Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs) shall be followed.

6.4 The results of the fieldwork will be assessed in local, regional and wider contexts.

6.5 A report that is fully representative of the results of the fieldwork will be prepared and copies will be sent to the client for dissemination to all relevant parties.

6.6 A summary of the project results, excluding any confidential information, may be prepared for wider dissemination (e.g. Archaeology in Wales and special interest and period-specific journals).

6.7 The project archive, including all artefacts and ecofacts (excepting those which may be deemed to be Treasure Trove) will be deposited with an appropriate body following agreement with the landowner.

6.8 A copy of the final report will be deposited with the regional HER at Dyfed Archaeological Trust within six months of the completion of the project.

6.9 Appropriate specialists to be used by DAT Archaeological Services include:

- **Industrial Archaeology** –Jennifer Protheroe-Jones, Principal Curator – Industry, National Waterfront Museum, Swansea
- **Post-medieval / medieval pottery** – Dee Brennan (local independent specialist)
- **Prehistoric Pottery** – Dr Alex Gibson (formerly of University of Bradford / now independent pottery specialist)
- **Prehistoric Flint** – Dr Andrew David (formerly of English Heritage, now independent lithics specialist)
- **Radiocarbon dating** - Beta Analytic
- **Animal Bones** – Worcester Archaeology
- **Fish bones** – Jennifer Browning (University of Leicester Archaeological Services
- **Environmental / Pollen analysis** – Worcester Archaeology

7 STAFF

7.1 This project will be managed by Fran Murphy, Head of DAT Archaeological Services.

7.2 Archaeological attendance during the watching brief will be undertaken by staff drawn from the team of archaeologists employed by DAT Archaeological Services.

8 QUALITY ASSURANCE

8.1 DAT Archaeological Services has considerable experience of undertaking all categories of archaeological fieldwork and always operates to best professional practice; adhering to CIfA guidelines where appropriate. The Trust is a Registered Organisation with CIfA and all staff abide by their code of conduct and adhere to their relevant standards and guidance.

8.2 DAT Archaeological Services operate robust internal monitoring procedures that ensure that the standard of each project is maintained from commencement to completion.

9 MONITORING

9.1 The fieldwork may need to be monitored by Dyfed Archaeological Trust – Development Management (DAT-DM) in their capacity as archaeological curator, who should be provided access to the site at any time during the archaeological works. The Head of DAT Archaeological Services may also monitor the on-site works intermittently.

10 HEALTH AND SAFETY

10.1 All permanent DAT Archaeological Services staff are CSCS[4] registered.

10.2 DAT Archaeological Services will carry out a health and safety risk assessment to ensure that all potential risks are minimised.

10.3 All known health and safety risk and the presence of any services etc must be made known to the attending archaeologist at the start of any groundworks by the client/site contractor.

10.4 All relevant health and safety regulations must be followed, including compliance with Welsh Government guidelines on working practices during the current Covid-19 Pandemic, and guidance issued by CIfA.

10.5 CIfA advise that Registered Organisations should ensure they are familiar with the latest *Site Operating Procedures*, published by the Construction Leadership Council (Version 4, updated 18th May 2020) and the latest *Covid-19 Working Advice Ver.1.1*, published by Prospect (5th May 2020), which addresses potential issues relating to archaeological site work. These procedures will be attached to the project risk assessment. If the site cannot operate in line with this guidance, then the project archaeologist will not be allowed to attend.

10.6 The project risk assessment details the precautions put in place to reduce the spread of Covid-19 Coronavirus during fieldwork.

10.7 All site inductions, H&S procedures and site rules of the site contractor will be made known to DAT Archaeological Services staff prior to them commencing work on-site.

10.8 Safety helmets, high visibility vests and boots are to be used by all site personnel as necessary. The site contractors will make all archaeological staff aware of any other PPE[5] that may be required and provide them. Archaeological staff must not enter any area where there is a considered to be a health and safety risk that has not or is not being appropriately mitigated against.

10.9 DAT Archaeological Services staff must ensure that their presence on site is communicated to all relevant site staff, especially machine operators.

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[4] ***Construction Skills Certification Scheme (Health and Safety Tested)***

[5] ***Personal Protection Equipment***

11 ARBITRATION

11.1 Any dispute or disagreement arising out of a contract in relation to this work shall be referred for a decision to the Chartered Institute of Archaeologist's arbitration scheme.

12 SOURCES

Bell, M. et al., 2016, *2Metal Mines Remediation Project Part 3: Wemyss Archaeological Assessment*, DAT Report No 2016/05 (Part 3)

Bell, M., 2020, *Wemyss Metal Mine Archaeological Desk Based Assessment Update,* DAT Report No 2020-55

Bick, D., 1986*, Frongoch Lead & Zinc Mine, British Mining No 30,* Northern Mine Research Society Monograph

Brown, D. H., 2011, *Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation*, Archaeological Archive Forum [online] available at <https://archaeologydataservice.ac.uk/archiveDS/archiveDownload?t=arch-799-1/dissemination/pdf/AArchives_v2.pdf> Accessed 02.02.2023

CIfA, 2014, *Standard and guidance for an archaeological watching brief*, Reading, Chartered Institute for Archaeologists, updated June 2020, [online] available at <https://www.archaeologists.net/sites/default/files/CIfASGWatchingbrief.pdf> Accessed 02.02.2023

NRW, 2016, *Abandoned Mine Case Study: Wemyss Lead & Zinc Mine,* [online] available at <https://cdn.cyfoethnaturiol.cymru/media/679806/wemyss-mine-case-study_2016_06.pdf> Accessed 02.02.2023

Jones, R. S., 2022, *Wemyss Lead & Zinc Mine, Pontrhydygroes, Ceredigion : Archaeological Watching Brief,* HRS Wales report no. 253

APPENDIX I:

DATA MANAGEMENT PLAN

This Data Management Plan (DMP) is produced in accordance with the *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives (Chartered Institute for Archaeologists 2014, updated 2020).* The table below is based on the Work Digital / Think Archive guidance for digital archives prepared by DigVentures, on behalf of Archaeological Archives Forum and in partnership with the Chartered Institute for Archaeologists. The project was funded by Historic England (Project No. 7796).

Section 1: Project Administration

Project Ref. No and name
FS22-041 – Wemyss Mine Phase II Geotech Works
ERN (if known)
129727
Project Type
Watching Brief
Client
Natural Resources Wales
Project Manager / Data Contact
Fran Murphy
Principal Archaeologist on site
Marion Shiner
Date DMP created
02/02/23
Date DMP last updated
02/02/23
Related data management policies
Written Scheme of Investigation Chartered Institute for Archaeologists (CIfA) *Standards & Guidance* Dyfed Archaeological Trust, 2018, archive retention policy Brown 2011, Archaeological Archives: a guide to best practice in creation, compilation, transfer and curation NPAAW, 2017, The National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales 2017 RCAHMW, 2015, RCAHMW guidelines for Digital Archives, Version 1 WAT, 2018, Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)

Section 2: Data Collection

Data Type (Delete as appropriate)
Documents Written Scheme of Investigation, Risk Assessment – Word doc & PDFs Context sheets, site registers, site notes - paper copies, scanned and saved as PDFs. Site plans – permatrace, scanned and saved as PDFs. Final report – Word doc & PDF Illustrations – Adobe Illustrator/Affinity Designer files, PDFs Specialist assessments (Finds, Environmental etc) – Word doc, PDF, Excel Spreadsheet **Images** Site photographs – Jpeg & Tiff (for archive) Other collected data (scans, archive material, social media images etc) – Jpegs **Survey** In house surveys - .dxf files, GIS files (see below) External surveys – Dependent on external contractor, eg .dxf, .dwg, .rwv etc **GIS** Mapinfo files, Esri Shapefiles.

Data acquisition
All data will be collected as per the methodologies and guidance stated in the WSI (Fieldwork / Methodology).

Section 3: Documentation and metadata

Documentation and metadata accompanying the data
All data recovered will be archived in accordance with the guidance stated in the WSI (Post Fieldwork Reporting & Archiving)

Section 4: Ethics and legal compliance

Management of any ethical, copyright and Intellectual Property Rights (IPR) issues
All personal data collected during the course of the project will be handled in accordance with Dyfed Archaeological Trust's *Personal Data Protection Policy* (2018, revised 2020) and current *Code of Practice*. Licence agreements will be established, and Copyright permissions will be sought as appropriate (eg reproduced mapping extracts, archive material, specialist reports) prior to the submission of the data and/or inclusion in the publication of the project results.

Section 5: Data Security: Storage and Backup

Data storage, accessibility, and safety during research
All site-produced data will be stored digitally at the first available opportunity. All digital information is stored on the DAT server, accessible by members of the staff. This will be checked regularly by the Project Manager. All digital data on the server is backed-up at regular intervals. The server contains ample capacity for all anticipated site data, and appropriate protocols are in place to manage any potential digital malfunction or cyber attack.

Section 6: Selection and Preservation

Data retention, sharing, and preservation
Data will be retained as per Dyfed Archaeological Trust *Archive Retention Policy* (2018).
Long-term preservation plan for the dataset
The digital archive relating to the project will be deposited with the NMR, held and maintained by the RCAHMW, Aberystwyth and will be created in accordance with their practices.

The final report will be submitted to the regional Historic Environment Record in PDF format, along with any additional information they require. If a different digital repository to the NMR is used, their own procedures will be established at the outset of a project and followed. If a project includes artefacts to be deposited at a museum, arrangements will be made prior to the commencement of the project, and a copy of the digital archive will be sent with the artefacts. Archiving costs are included within the project budget.

Section 7: Data Sharing

Sharing and accessibility
The dissemination of data is detailed in the WSI (Post-Fieldwork Report and Archiving).

Section 8: Responsibilities

Rsponsibilities
Data collection, storage and manipulation will be carried out by the site team. The Project Manager will be responsible for the implementation of the data management plan.

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