

# **METAL MINES REMEDIATION PROJECT PART 1: ABBAY CONSOLS ARCHAEOLOGICAL ASSESSMENT**



Prepared by Dyfed Archaeological Trust  
For Natural Resources Wales



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## METAL MINE REMEDIATION PROJECT PART 1: ABBAY CONSOLS ARCHAEOLOGICAL ASSESSMENT

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*Paratowyd yr adroddiad yma at ddefnydd y cwsmer yn unig. Ni dderbynnir cyfrifoldeb gan Ymddiriedolaeth Archaeolegol Dyfed Cyf am ei ddefnyddio gan unrhyw berson na phersonau eraill a fydd yn ei ddarllen neu ddibynnu ar y gwybodaeth y mae'n ei gynnwys*

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ABBEY CONSOLS  
ARCHAEOLOGICAL ASSESSMENT**

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**METAL MINE REMEDIATION PROJECT PART 1:**  
**ABBAY CONSOLS**  
**ARCHAEOLOGICAL ASSESSMENT**

**SUMMARY**

*DAT Archaeological Services were commissioned by Natural Resources Wales to provide an archaeological assessment to inform an option appraisal process for environmental remediation works at three former metal mines in Ceredigion; Abbey Consols (SN 74304 66123); Esgair Mwyn (SN 75469 69293); and Wemyss (SN 71579 74089). Natural Resources Wales defined study areas for these three sites: Abbey Consols covering an area of c.3.3ha; Esgair Mwyn covering an area of c.16.2ha; and Wemyss an area of c.11.9ha.*

*This report forms Part 1 of the three assessments and specifically considers the Abbey Consols mine. The object of the assessment is to collate existing information and identify the most significant elements of the mine sites and provide a plan of each mine identifying zones of archaeological sensitivity or any specific features of high significance. In addition, this assessment is intended to identify any known archaeological remains and their significance, as well as identify the potential for hitherto unknown archaeological deposits or structures to be present within the respective mine areas, highlighting any features or areas of high sensitivity.*

*These assessments will be provided for use in the development of the scope of any potential future environmental remediation works required at the mines.*

*Abbey Consols mine is located to the northeast of Pontrhydfendigaid in Ceredigion, within the Upper Teifi Valley and is a significant source of metal pollution. This is causing a chemical and ecological impact on downstream watercourses. A discussion of potential mitigation measures in relation to all three metal mines is included in Appendix 1.*

## **1. INTRODUCTION**

### **1.1 Project Proposals and Commission**

- 1.1.1 DAT Archaeological Services were commissioned by Natural Resources Wales (NRW) to provide an archaeological assessment to inform an option appraisal process for environmental remediation works at three former metal mines in Ceredigion; Abbey Consols (SN 74304 66123); Esgair Mwyn (SN 75469 69293); and Wemyss (SN 71579 74089).
- 1.1.2 Natural Resources Wales defined study areas for these three sites: Abbey Consols covering an area of c.3.3ha; Esgair Mwyn covering an area of c.16.2ha; and Wemyss an area of c.11.9ha.
- 1.1.3 This report forms Part 1 of the overall study and specifically considers the Abbey Consols mine. A discussion of potential mitigation measures in relation to all three metal mines is included in Appendix 1.
- 1.1.4 A written scheme of investigation was prepared for the Metal Mine Remediation Project, covering all three mines. The scope was agreed with NRW prior to the commencement of the reports. The object of the assessments as outlined in the Written Scheme of Investigation (Appendix 2) is to:

***...."collate existing information and identify the most significant elements of the mine sites and provide at least one plan of each mine identifying zones of archaeological sensitivity or any specific features of high significance. The assessments will be provided for use in the development of the scope of future environmental remediation works required at the mines."***

- 1.1.4 In addition, this assessment is intended to *"identify any known archaeological remains and their significance, as well as identify the potential for hitherto unknown archaeological deposits [or structures] to be present within the respective mine areas, highlighting any features or areas of high sensitivity"*.

### **1.2 Scope of the project**

- 1.2.1 This assessment is presented as a fulfilment of the Written Scheme of Investigation (Appendix 2) as approved by Natural Resources Wales.
- 1.2.2 This assessment is primarily a desk-based study of the Abbey Consols mine study area as defined by NRW (Figure 2). The aim of this assessment is to establish how the mine developed over time and where structures were located. The results of this assessment including an illustrative plan of archaeological constraint are intended to identify the extent and character of the archaeological resource.
- 1.2.3 In addition to the desk-based study, this assessment included consultation with members of the Welsh Mines Preservation Trust (namely, Graham Levins, Robert Ireland, Peter Cloughton and David Sables), and Robert Protheroe-Jones, Curator of Heavy Industries at Amgueddfa Cymru National Museum of Wales.
- 1.2.4 The mine site was visited to assess and verify the presence or absence of archaeological remains, and to identify any new features within the bounds of each study area. These site visits were undertaken with Tom Williams of Natural Resources Wales and members of the Welsh Mines Preservation Trust.

- 1.2.5 The assessment should be seen only as the first stage of the archaeological process and does not preclude the possibility that further archaeological mitigation may be required prior to, or during, any programme of remediation works.
- 1.2.6 The report complies with the Standard and Guidance for an Archaeological Desk-Based Assessment (Chartered Institute for Archaeologists (CIfA), 2014) and abides by their Codes of Conduct (CIfA 2014).

### 1.3 Abbreviations used in this report

- 1.3.1 All sites recorded on the regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Sites recorded on the National Monument Record (NMR) held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) are identified by their National Primary Record Number (NPRN). Scheduled Ancient Monuments (SAMs) are recorded by a SAM number. Altitude is expressed to Ordnance Datum (OD). References to cartographic and documentary evidence and published sources will be given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

### 1.4 Illustrations

- 1.4.1 Printed map extracts are not necessarily reproduced to their original scale and are illustrative only.

### 1.5 Timeline

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

| 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 <sup>1</sup> –  | 1536 – 1750           |             |
| Industrial Period –                  | 1750 – 1899           |             |
| Modern –                             | 20th century onwards  |             |

**Table 1:** Archaeological and Historical Timeline for Wales.

<sup>1</sup> 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

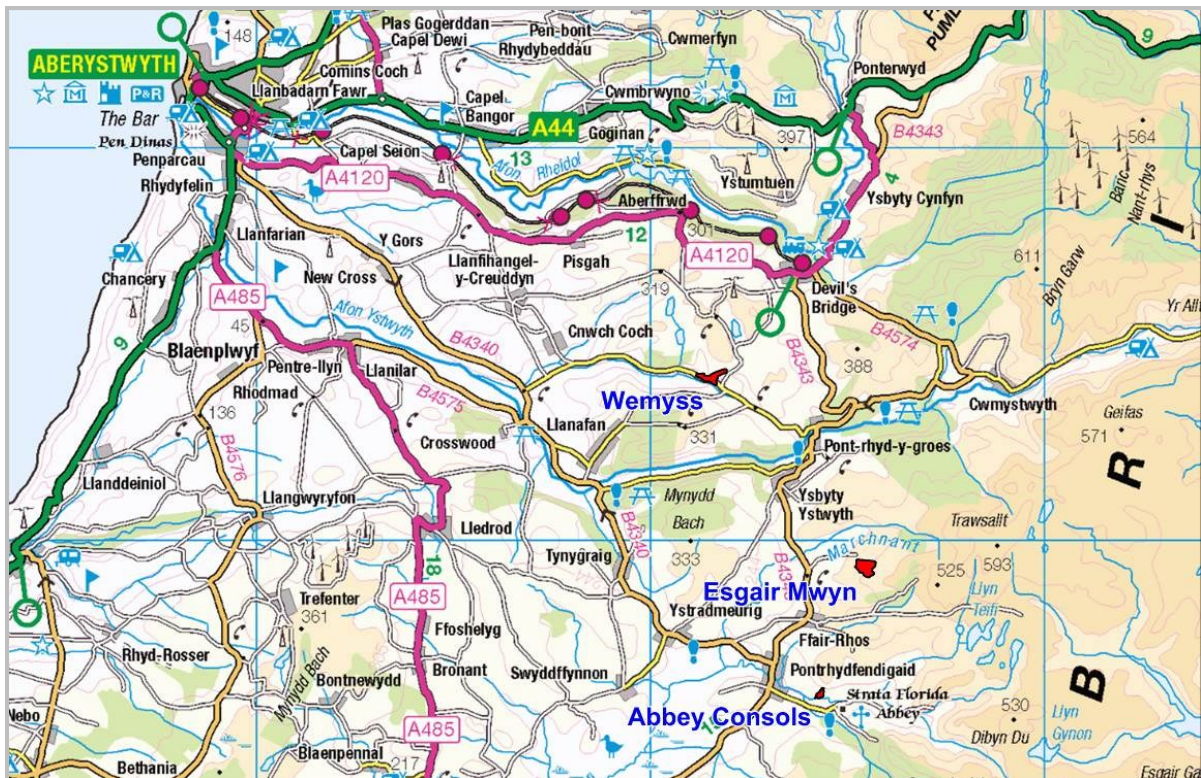


## 2. LOCATION

### 2.1 Site locations

2.1.1 The map below (Figure 1) shows the locations of all three mine sites that form part of the Metal Mines Remediation Project. Abbey Consols mine is located in the upper reaches of the Afon Teifi valley close to the valley floor.

2.1.2 The mine lies 1.2km to the southeast of Pontrhydfendigaid and 0.4km to the northwest of the remains of Strata Florida Abbey (Figure 2). The mine site lies on the northern slope of the Afon Teifi valley between around 180m to 220m aOD.



**Figure 1:** Location map of Abbey Consols, Esgair Mwyn and Wemyss, metal mines on the 1:250,000 Ordnance Survey map. The study areas are shown shaded in red.

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### 2.2 The study area

2.2.1 The study areas for each mine were defined and supplied by Natural Resources Wales. The study area for Abbey Consols mine covers an area of c.3.3ha and is shown in Figure 2.



### **3. METHODOLOGY**

#### **3.1 Archaeological Assessment**

- 3.1.1 This Archaeological Desk Based Assessment has been prepared using the following methodology which has been discussed and agreed with the archaeological advisors to the planning authority and with NRW. A written scheme of investigation detailing this methodology was prepared and submitted for approval to the archaeological advisors to the planning authority (Appendix 2).
- 3.1.2 The archaeological assessment has been prepared using the following sources of information:
- Dyfed Archaeological Trust Historic Environment Record data and other relevant information (including a review of online information held on the RCAHMW Coflein site) – minimum search area will be that as defined within the tender documentation;
  - Identification of any Scheduled Ancient Monuments, Listed Buildings, Conservation Areas or Historic Landscape Areas within or in the vicinity of the site area from information held by Dyfed Archaeological Trust, CADW and NRW (formerly CCW) – 2km search area;
  - Readily available bibliographic information, cartographic material and photographs (including aerial photographs) held at the Trust;
  - A review of historic maps to include a map regression exercise;
  - Relevant web-based information;
  - Site visit and walkover survey;
  - Consultation with the Welsh Mines Preservation Trust regarding each site and identification of any specific features of high significance;
  - Consultation with Robert Protheroe-Jones, curator of Heavy Industries at Amgueddfa Cymru National Museum of Wales, and a Trustee of Dyfed Archaeological Trust;
  - A consideration of underground features of the mines; and
  - Assessment of the archaeological potential of the area.
- 3.1.3 The report complies with the Standard and Guidance for Archaeological Desk-Based Assessments (CIfA 2014).

#### **3.2 Site Walkover Survey**

- 3.2.1 A site visit and walkover of the Abbey Consols site was undertaken on 4<sup>th</sup> February 2016, by Menna Bell & Fran Murphy (DAT Archaeological Services), Tom Williams (NRW) and Peter Cloughton & David Sables (Welsh Mines Preservation Trust).
- 3.2.2 The site visits comprised walkovers of the study areas and its surrounding environs. Photographs were taken and field observations recorded in note form.

## **4. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND**

### **4.1 Historic Landscapes**

- 4.1.1 The study area defined for Abbey Consols mine lies within the Ystrad Fflur Historic Landscape Character (HLC) area as recorded on the Register of Landscapes of Outstanding Historic Interest in Wales (Cadw 1998). This lies within the wider Upland Ceredigion landscape area.
- 4.1.2 The historic background for the Ystrad Fflur HLC mostly concerns Strata Florida Abbey, with only a very brief mention of Abbey Consols mine where it states: *Abbey Consols metal mine was most active in the mid to late 19th century.*
- 4.1.3 The description and essential historic landscape components of the HLC are summarised as follows: *This area consists of the valley floor of the Teifi to the east of Pontrhydfendigiad and the lower slopes of the valley side. It ranges in height from 180m on the valley floor to almost 300m at its northern end, where it climbs the valley side to include Pen-y-wern hir Farm. It is a landscape of small, irregular enclosures and scattered farms. Boundaries to the enclosures consist of earth banks with occasional stone-faced banks. Hedges on top of these banks are in fair to good condition, though away from the valley floor they are becoming derelict. Most hedges are supplemented with wire fences. Occasionally a hedge supports distinctive hedgerow trees. Strata Florida Abbey has a concentration of dry-stone wall boundaries around it. There are some small stands of deciduous woodland. Improved grazing is the dominant land-use, with some pockets of rougher grazing on the valley floor.*
- 4.1.4 There is only a single specific reference to metal mines within the description: *The stone buildings and spoil heaps of old lead mines provide a distinctive landscape component to this area.*

### **4.2 Historical Development**

- 4.2.1 There is very little readily available information on the historical development of the Abbey Consols Mine. Due to its proximity to Strata Florida Abbey and the fact that the Cistercians were skilled at ore extraction and processing, it is possible that some level of medieval mineral extraction could have taken place at the site.
- 4.2.2 It is known that the site was worked before 1845, with Tithe map information from 1847 indicating two mine pits were present in the area known as Bronberllan (Bron-y-Berllan being the farm directly to the northeast of the mine site). Information held on the HER and NMR indicate that the workings were re-opened 1848 and 1852, and were working from 1856-1861, 1877-82, 1886-91, 1893-98 and 1905-9.
- 4.2.3 The mine was first called Bronberllan, the name then changed to the Florida Lead Mine by the end of the 19<sup>th</sup> century, the name continuing into the 20<sup>th</sup> century. It is recorded that it produced 1236 tons of lead ore and 1765 tons of zinc ore before for the period 1848 to 1909 when it closed.
- 4.2.4 NRW records that Abbey Consols Mine is the largest source of zinc pollution into the Afon Teifi, with an estimate of over 2 tonnes per annum being discharged into the river.
- 4.2.5 The levels and adits associated with the mine run into the hillside in the northern part of the study area and beyond its boundary (Figure 2). The vast majority of the study area was associated with ore preparation and processing.

- 4.2.6 In recent years the area has been partially remodelled to accommodate a race track.

### 4.3 Recorded Archaeology

#### ***Scheduled Ancient Monuments***

- 4.3.1 There are four Scheduled Ancient Monuments (SAMs) with 2km of the Abbey Consols study area (Figure 3). None of the scheduled monuments lie within the mine area.

| <b>SAM No</b> | <b>SAM Name</b>                       | <b>Period</b>  | <b>NGR</b>    | <b>Distance (km)</b> |
|---------------|---------------------------------------|----------------|---------------|----------------------|
| CD001         | Strata Florida Abbey                  | Medieval       | SN74674 65710 | 0.39 SE              |
| CD060         | Strata Florida Churchyard Cross       | Early Medieval | SN74659 65764 | 0.4 SE               |
| CD109         | Pen y Bannau Camp Hillfort            | Prehistoric    | SN74179 66871 | 0.55 N               |
| CD269         | Gilfach y Dwn Fawr Defended Enclosure | Prehistoric    | SN73363 64787 | 1.33 SW              |

**Table 2:** Scheduled Ancient Monuments within 2km of the Abbey Consols mine site, including distance to mine area and direction (Figure 3).

- 4.3.2 The closest SAMs to the Abbey Consols mine area are the remains of the medieval Strata Florida Abbey (SAM CD001) and the early medieval churchyard cross in the present churchyard (CD060). These both lie around 0.4km to the southeast.
- 4.3.3 The other two scheduled monuments are represented by hillforts of probable Iron Age date. Pen Y Bannau Camp (CD109) lies 0.55km to the north on higher ground at around 352m aOD. Gilfach y Dwn Fawr defended enclosure (CD269) lies on higher ground to the southeast of Abbey Consols at around 290m aOD.

#### ***Listed Buildings***

- 4.3.4 There are eighteen Listed buildings within the 2km search radius around the Abbey Consols study area (Figure 3). None of the buildings lie within the study area itself.
- 4.3.5 Of most significance is the Grade I listed building of the medieval remains of Strata Florida Abbey (also a SAM see above). The remainder of the sites are Grade II listed and of post-medieval date.

| <b>PRN Number</b> | <b>Listing</b> | <b>Name</b>  | <b>NGR</b>    | <b>Grade</b> | <b>Distance (km)</b> |
|-------------------|----------------|--|---------------|--------------|----------------------|
| 2043              | 9913           | Strata Florida Abbey ruins                                 | SN74676 65729 | I            | 0.44 SE              |
| 5557              | 9923           | Rhydfendigaid Calvinistic Methodist Chapel                 | SN73043 66651 | II           | 1.28 NW              |
| 5561              | 9912           | Church of St Mary  | SN74650 65762 | II           | 0.39 SE              |
| 5562              | 9911           | Pont Rhydfendigaid Bridge                                  | SN73025 66503 | II           | 1.24 NW              |
| 7155              | 9914           | Great Abbey Farmhouse including front garden wall, Mansion | SN74662 65688 | II*          | 0.46 SE              |
| 9904              | 82980          | Pantymfedwen   | SN75494 65023 | II           | 1.51 SE              |
| 58187             | 82967          | Barn at Pantymfedwen                                       | SN75536 65033 | II           | 1.54 SE              |
| 58188             | 82968          | Barn range at W end of                                     | SN74606 65653 | II           | 0.45 SE              |

|       |       |   |               |    |         |
|-------|-------|---|---------------|----|---------|
|       |       | farmyard at Great Abbey Farm                            |               |    |         |
| 58190 | 82970 | Coach-house at Pantyfedwen                              | SN75525 65018 | II | 1.54 SE |
| 58191 | 82971 | Cowhouse at E end of farmyard at Great Abbey Farm       | SN74640 65643 | II | 0.48 SE |
| 58192 | 82972 | Dol Teifi, House  | SN73456 66221 | II | 0.74 W  |
| 58193 | 82973 | Dolgoed, House  | SN73535 66175 | II | 0.65 W  |
| 58194 | 82974 | Farm building on N side of farmyard at Great Abbey Farm | SN74621 65674 | II | 0.44 SE |
| 58197 | 82977 | Islwyn, house   | SN73079 66659 | II | 1.25 NW |
| 58199 | 82979 | Outbuilding to S of Great Abbey Farmhouse               | SN74664 65668 | II | 0.47 SE |
| 58200 | 82981 | Railings to Rhydfendigaid Calvinistic Methodist chapel  | SN73066 66640 | II | 1.25 NW |
| 58201 | 82982 | The Post Office   | SN72968 66402 | II | 1.26 NW |
| 58202 | 82983 | War Memorial and Railings                               | SN72970 66374 | II | 1.25 NW |

**Table 3:** Listed Buildings within 2km of the Abbey Consols Mine, including distance to mine area and direction (Figure 3).

***Non-Designated Archaeological Remains within the study area***

- 4.3.6 There are no designated historical assets within the Abbey Consols study area. Consultation of the HER and National Monuments Record (NMR) held by the RCAHMS revealed that there are eleven, recorded, non-designated archaeological features within the study area (Figure 4). Table 4 lists these sites; those sites held within the HER have been allocated a PRN, those held within the NMR have been allocated an NPRN. All are of post-medieval date.
- 4.3.7 All of the recorded sites relate to the use of the mine and only represent those which have been previously identified, mostly through cartographic analysis or site visits. No intrusive archaeological investigations have been undertaken to determine the presence or depth of any below ground archaeology.

***Newly identified archaeological sites***

- 4.3.8 The site visit undertaken on 4<sup>th</sup> February 2016 identified two further sites not recorded on the HER or NMR. The sites have not been allocated PRNs as yet, rather for the purpose of this study, they have been allocated a specific "Site Number" relevant only to Abbey Consols study area (Figure 5). Abbey Consols New Site 1 is an area of fine spoil tips and dressing floors; Abbey Consols New Site 2 is a series of building remains.
- 4.3.9 A further site was identified from Cartographic analysis: Abbey Consols New Site 3 is a tramway shown on the first edition Ordnance Survey map (Figures 5 & 7). The new sites are detailed in Table 5.

| PRN   | NPRN  | Name   | Summary   | NGR          |
|-------|-------|--|---|--------------|
| 9310  | 33843 | Abbey Consols;<br>Bronberllan; Florida;<br>Cwm Mawr No.2 Mine;<br>Strata Florida | Small metal mine complex. Recorded lead ore output-1500 tons; Zinc ore output-2000 tons   | SN743661     |
| 41098 |       | Florida Mine   | Wheelpit partial remains. Marked on 2nd edn. 25" Ordnance Survey map fed by leat (PRN 41095). Remains of possible feed channel on east. Partially destroyed by later quarry activity.   | SN7437066230 |
| 97680 |       | Abbey Consols;<br>Bronberllan; Florida;<br>Cwm Mawr No.2 Mine;<br>Strata Florida | Three well-outlined settling pits in outwash area of fines/ slimes (Protheroe-Jones 1993, mine 197, no.1).<br>Revisited 3.3.2011 Settling pits 1 and 2 fieldmap (PRN 97680) now barely detectable with no.2 having virtually disappeared (Protheroe-Jones 2011, | SN74276606   |
| 97682 |       | Abbey Consols;<br>Bronberllan; Florida;<br>Cwm Mawr No.2 Mine;<br>Strata Florida | Fines tips; wooden structures being eroded from south edge (Protheroe-Jones 1993, mine 197, no.3).<br>Revisited 3.3.2011 "Recently installed drainage channel skirting along eastern edge of tips; Fines lobe of tips levelled and grassed over within circuit  | SN74296610   |
| 97683 |       | Abbey Consols;<br>Bronberllan; Florida;<br>Cwm Mawr No.2 Mine;<br>Strata Florida | Development rock tip from Deep Adit Level tipped in a pronounced lobate pattern (Protheroe-Jones 1993, mine 197, no.4).<br>Revisited 3.3.2011 Development rock lobe of tips partially reclaimed and grassed over (Protheroe-Jones 2011, mine 197, no.7). See P  | SN74286613   |
| 97684 |       | Abbey Consols;<br>Bronberllan; Florida;<br>Cwm Mawr No.2 Mine;<br>Strata Florida | Vestigial ruin; ruined wooden tanks to SW (Protheroe-Jones 1993, mine 197, no.5).<br>Revisited 3.3.2011 Structures 5 and 7 have suffered slight degradation (Protheroe-Jones 2011, mine 197, no. 10). See PRN 9310 for additional references.                   | SN74366609   |
| 97685 |       | Abbey Consols;<br>Bronberllan; Florida;<br>Cwm Mawr No.2 Mine;<br>Strata Florida | Vestigial ruin (Protheroe-Jones 1993, mine197, no.7). Revisited 3.3.2011 Structures 5 and 7 have suffered slight degradation (Protheroe-Jones 2011, mine197, no.10).<br>See PRN 9310 for additional references.   | SN74346612   |
| 97686 |       | Abbey Consols;<br>Bronberllan; Florida;<br>Cwm Mawr No.2 Mine;<br>Strata Florida | Site of ore bins barely recognisable (Protheroe-Jones 1993, mine197, no.8).<br>Revisited 3.3.2011 "No trace of ore bins" (Protheroe-Jones 2011, mine197, no.9).<br>See PRN 9310 for additional references.  | SN74346614   |
| 97687 |       | Abbey Consols;<br>Bronberllan; Florida;<br>Cwm Mawr No.2 Mine;                   | No trace of structure (Protheroe-Jones 1993, mine 197, no.9). Marked on Ordnance Survey 2nd edition map (1905). See PRN 9310 for additional references.   | SN74366615   |

|        |  |  |   |            |
|--------|--|--|---|------------|
|        |  | Strata Florida   |   |            |
| 97688  |  | Abbey Consols;<br>Bronberllan; Florida;<br>Cwm Mawr No.2 Mine;<br>Strata Florida | No trace of Deep Adit Level (Protheroe-Jones 1993, mine 197, no.10). See PRN 9310 for additional references.                                      | SN74366620 |
| 100419 |  | Abbey Consols;<br>Bronberllan; Florida;<br>Cwm Mawr No.2 Mine;<br>Strata Florida | Gulley on site of cutting entrance to Deep Adit - extant in 1993 (Protheroe-Jones 2011, mine 197, no.17). See PRN 9310 for additional references. | SN74366618 |

**Table 4:** Non-designated archaeological assets within the Abbey Consols study area (Figure 4).

| Abbey Consols<br>Site Number | Type                          | Summary  | Evidence    | NGR          |
|------------------------------|-------------------------------|--|-------------|--------------|
| <b>1</b>                     | Fine tips and dressing floors | Area of fine tips and possible dressing floors represented by surviving earthworks           | Earthwork   | SN 743 766   |
| <b>2</b>                     | Buildings                     | 3 ruined buildings, on slight terraces, with traces of wooden launders?                      | Earthwork   | SN74364661   |
| <b>3</b>                     | Tramway                       | Tramway shown on 1st edition 1881 1:2500 OS map. Not shown on 2nd edition 1905 1:2500 OS map | Documentary | SN7431966127 |

**Table 5:** Newly identified archaeological sites within the Abbey Consols study area (Figure 5).



#### **4.4 Cartographic Information**

##### ***Gwnnws Tithe Map of 1847*** (Figure 6)

- 4.4.1 The tithe apportionment of 1847 for Gwnnws parish (Figure 6) lists all the fields within the study area as being owned by Colonel William Edward Powell and occupied by Thomas Jones, although they are part of two different properties: Field numbers 338-342 are listed under 'Part of Abbey,' whilst field numbers 348-352 are part of 'Bronberllan.' Bronberllan Farm (spelt Bwnberllan in the apportionment) is clearly shown on the tithe map, as is the River Teifi.
- 4.4.2 Two 'mine pits' are labelled in field 349, which is called 'Gwndwn' (unploughed land / open space) and used for arable. Although not part of the study area, this is presumably the site of the original lead workings in the area. 'Unploughed land' may be a reference to the difficulty of ploughing the uneven ground left by mine workings.
- 4.4.3 The only field not under arable, pasture or meadow is 350, which is woodland. Two field names are suggestive of previous workings within the study area. The first is field 342, 'Cae Du' (black field), suggestive of a dark mineral-rich soil. The second is field 340, 'Cae Trenches' (field of trenches), probably alluding to previous open cast prospecting or mining there.

##### ***First Edition Ordnance Survey 25" Map of 1889*** (Figure 7)

- 4.4.4 This map (Figure 7) shows the significant change that took place between 1847 and 1889. The 'Florida Lead Mine' is clearly shown with new trackways and tramways, many buildings, a shaft, and filter beds. Scarp marks show the landscaping that has taken place as a result of mining and tipping. Some field boundaries have moved, presumably to provide sufficient space for the operation.
- 4.4.5 Many currently recorded archaeological sites seem to coincide with features on this map (Figure 4). At the northern end of the site an incline is shown serving the level in this area (although it is not marked as such). At the southern end of the incline are a number of buildings (PRNs 97686 and 97687) and two tramways (Abbey Consols New Site 3). It also appears that these structures are located on top of a large spoil tip.
- 4.4.6 PRN 97687 is the northernmost building/structure shown (next to the 's' in 'tramways'). PRN 97686 is the larger building immediately to the southwest of PRN 97687, where the ore bins were housed. The building group to the south of this is PRN 97685, and to the south of this again, another building group is PRN 97684. Spoil heaps PRN 97683 is shown to the north of the two east-west tramways. The filter beds (settling pits) and fine tips, PRNs 97680 and 97682, are clearly shown.
- 4.4.7 The 1891 1:10560 OS map shows the same layout, although in less detail, and is not reproduced here.

##### ***Second Edition Ordnance Survey 25" published in 1906*** (Figure 8)

- 4.4.8 Changes at the Florida Lead Mine between 1889 and 1906 are apparent from the Ordnance Survey map published in 1906 (Figure 8). On the one hand, a wheel pit not marked on earlier maps is now visible (PRN 41098), but a decline is seen throughout the rest of the study area with buildings much reduced and only two filter beds now marked. All of the PRNs shown on the 1<sup>st</sup> edition map (Figure 7) are still recognisable on the 2<sup>nd</sup> edition map (Figure 8). The most obvious change is the removal of the tramways.

- 4.4.9 The next historic OS maps, the 1906 and 1953 1:10560 versions, show the same layout in less detail, and are not reproduced here.
- 4.4.10 By the 1963-4 1:10560 OS map, a few more buildings have disappeared, and on the 1:2500 map of 1982, the filter beds and spoil heaps have gone and only three small structures are outlined. The 1:10000 OS map of 1982 shows field boundary changes in the southwestern part of the site resulting in a pattern that is similar to the one seen today.

## **4.5 Site Visit**

- 4.5.1 A site visit was undertaken on 4th of February 2016 to assess the nature and extent of any surviving archaeology on the ground and to allow for the possible identification of previously unrecorded sites.
- 4.5.2 Recent, modern activity in the area has adversely affected the site. The northern area of the study area has been subject to significant quarrying and the main area of the mine has since been landscaped to accommodate a racing track. The site has also been subject to modern drainage. However, there are surviving structures and features still visible on the site although they are in poor condition.
- 4.5.3 The modern quarry at the northern end of the study area has removed much of the evidence of the wheelpit (PRN 41098) situated in this area. Gone too is the trace of the deep adit (PRN 97688) in this vicinity.
- 4.5.4 It is possible to identify the remains of at least three stone built structures along the eastern side of the study area (Abbey Consols New Site 2). These appear to be built on a series of at least four terraces, are orientated north/south and are adjacent to wooden stumps and launders (Photo 1). These wooden components may be the remains of wooden tanks (PRN 97684).
- 4.5.5 Immediately south of these structures is an expansive area of fine waste materials and tailings (Photo 2). These tips are most likely to be associated with the buildings and structures represented in this area on the 1<sup>st</sup> edition Ordnance Survey map (Figure 7). It is likely that these tips represent the remains of dressing floors (Abbey Consols New Site 1).
- 4.5.6 A modern drainage channel flows past the remains to the east of the study area and borders the area of fine tips to the south (Photo 3). In the south-western region of the study area are the traceable remains of at least three filter beds (PRN 97680) which still collect surface water (Photo 4). This drain and surface water discharges into the River Teifi which meanders to the south of the site.
- 4.5.7 The north-western shoulder of the site is occupied by the remains of coarse spoil tips (PRN 97683) some of which have been partially removed creating a small ridge (Photo 5). These tips are overlying the site of the former tramway depicted on the 1<sup>st</sup> edition 1:2500 Ordnance Survey map (Abbey Consols New Site 3). The remains of this are not visible on the ground but it is possible that it may survive buried beneath the tips.

#### **4.6 Previous Archaeological Work**

- 4.6.1 A detailed survey of the remains of the mine was undertaken in 1993 by Robert Protheroe-Jones on behalf of the Dyfed Archaeological Trust. The results of this survey have been added to the HER and the PRNs generated from this survey are those which have been used in this assessment. Robert Protheroe-Jones has since conducted more recent surveys and a review of the site; the results of which are pending.

## **5 ARCHAEOLOGICAL CONSTRAINTS** (Figure 9)

5.1 Following the results of the desk-based assessment and the completion of the walk-over survey, it has been possible to draw a map of the study area showing the archaeological constraints. This map identifies areas of low, medium or high archaeological potential with areas coloured green, amber and red respectively (Figure 9). This map can be used to inform the detailed design stage of the remediation project.

5.2 The constraints map shows the study area outlined in purple and divided into four separate zones of archaeological potential.

**Area 1:** (Shaded red) Area of High archaeological potential

5.3 This area encompasses extent of the surviving structures and fine spoil tips in the eastern and southern regions of the study area. These represent the most extant elements of the site and it is possible that further remains survive beneath the swathe of dumps in this area.

**Area 2:** (Shaded amber) Area of Medium archaeological potential

5.3 Whilst this area has been subject to some landscaping owing to the construction of the racing track, it is possible still that evidence of the former tramway survives beneath the coarse tips in this area.

**Area 3:** (Shaded green) Area of Low archaeological potential

5.4 The northern region of the study area has largely been destroyed by recent quarrying and it is unlikely that much of the earlier industrial archaeology survives here.

**Area 4:** (Shaded red) Area of High archaeological potential

5.5 Area 4 accounts for the remainder of the wheelpit which survived the quarrying activity. It is possible that other archaeological features associated with this pit also survive here.

## **6. SOURCES**

### **Cartographic**

1847 - Tithe Award map of 1847 for the parish of Gwnnws  
1888 - First Edition Ordnance Survey 25-inch map of Cardiganshire  
1891 - Ordnance Survey 6-inch map of Cardiganshire  
1905 - Ordnance Survey 25-inch map of Cardiganshire  
1906 - Ordnance Survey 6-inch map of Cardiganshire  
1953 - Ordnance Survey 6-inch map of Cardiganshire

### **Published**

Cadw 1998. Register of Landscapes of Outstanding Historic Interest in Wales.  
Murphy, K,. 1999. Upland Ceredigion Historic Landscape Characterisation. Dyfed Archaeological Trust.

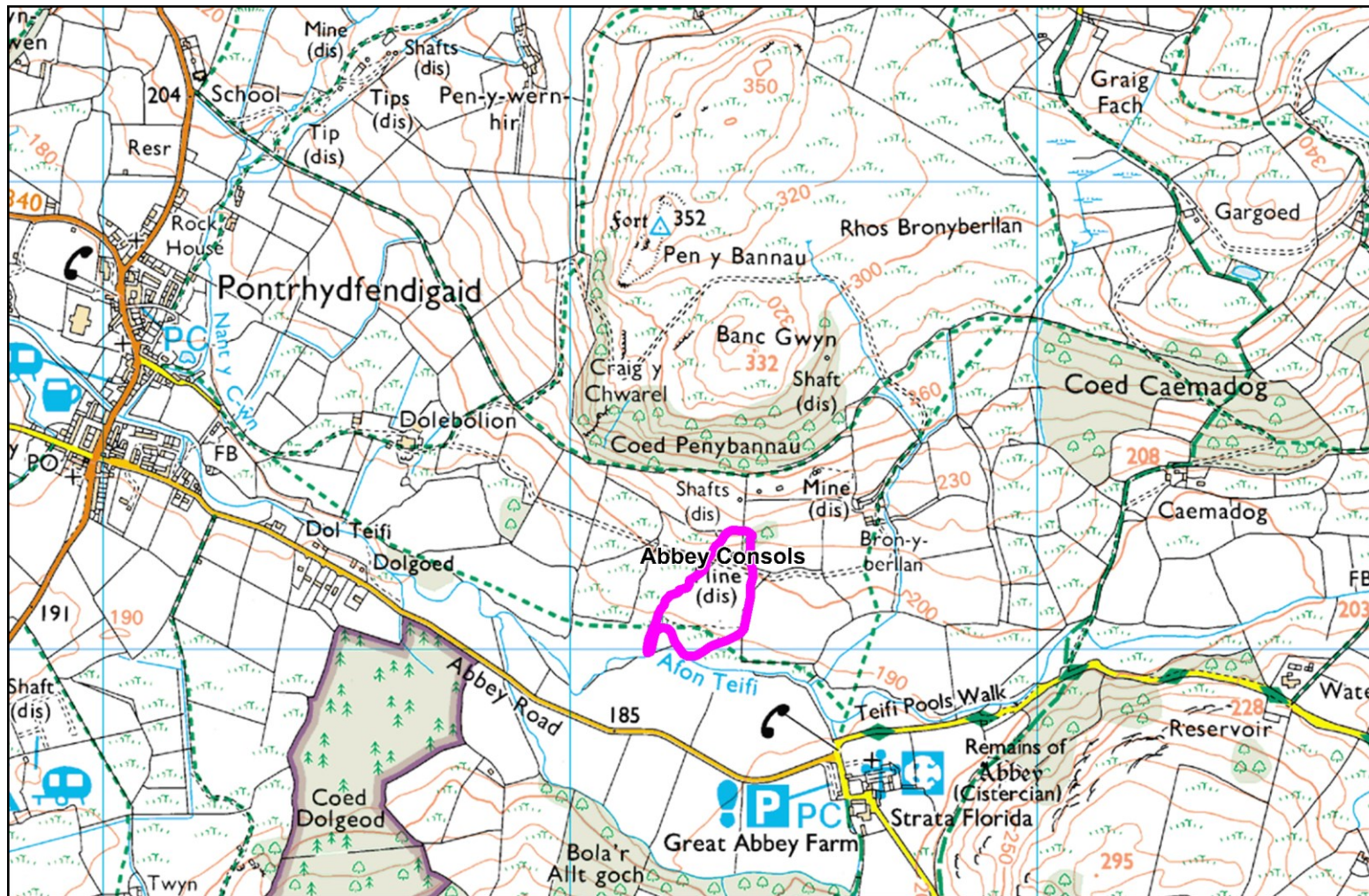
### **Database**

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

### **Websites**

Coflein: The Royal Commission on the Ancient and Historic Monuments of Wales.  
Plwm: The Heritage of Ceredigion's Uplands: <http://www.plwm.org.uk/> (Accessed Feb 2016).

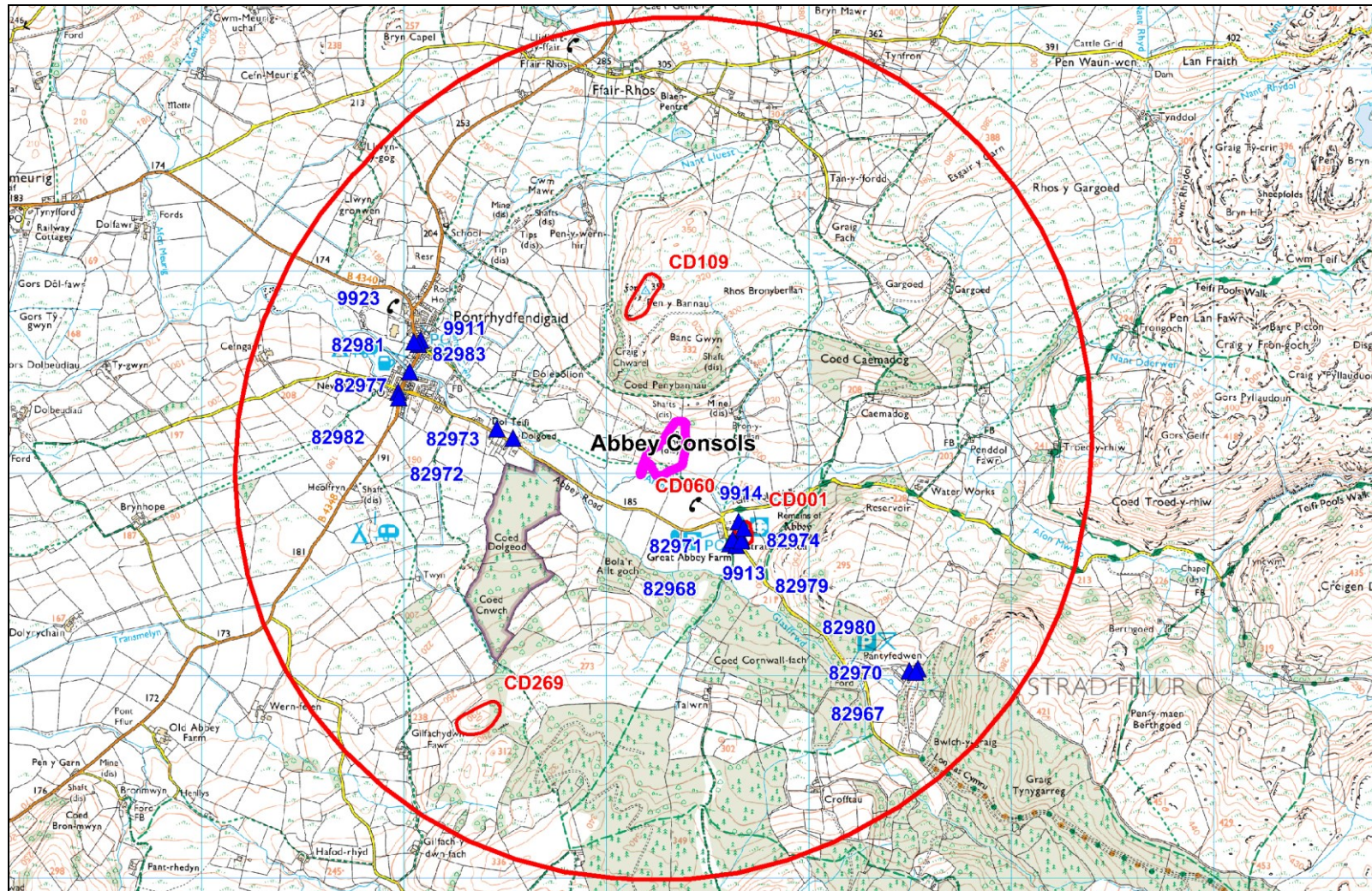
## FIGURES



**Figure 2:** Location map showing study area of Abbey Consols as defined by NRW.

Reproduced from the Ordnance Survey 1:25,000 scale map with the permission of The Controller of Her Majesty's Stationery Office, © Crown Copyright Dyfed Archaeological Trust, The Shire Hall, Carmarthen Street, Llandello, Carmarthenshire SA19 6AF. Licence No 100020930

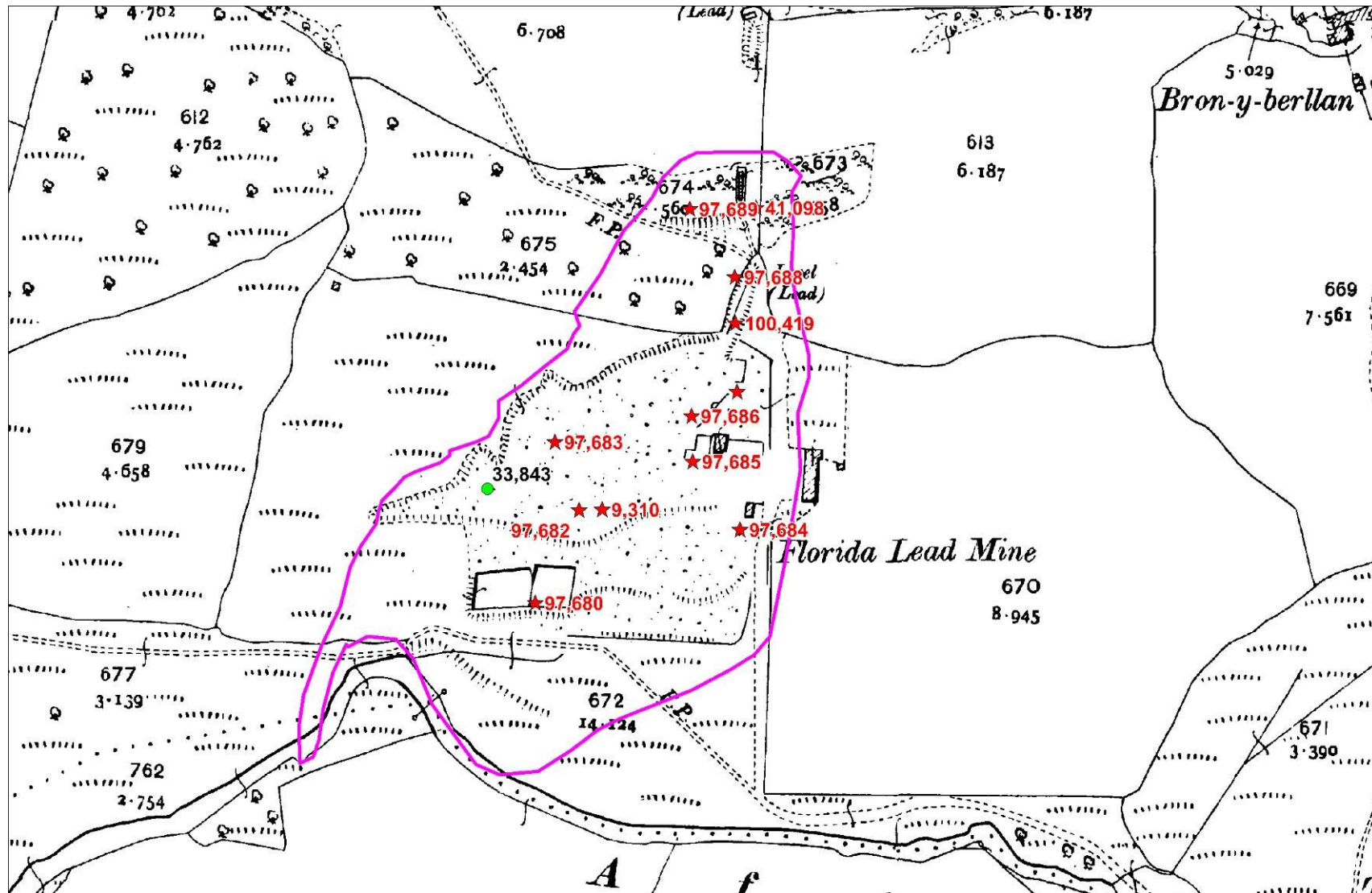




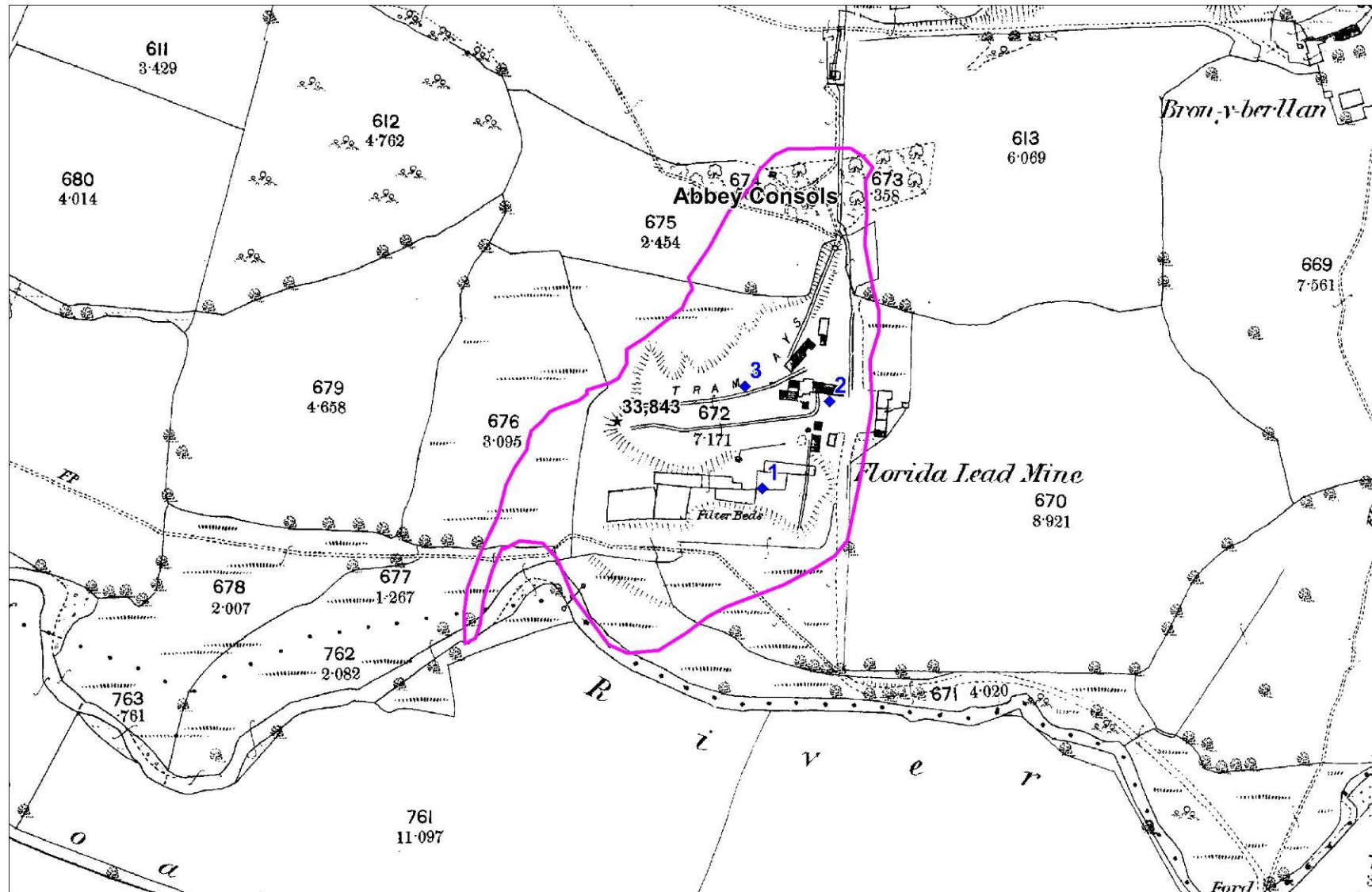
**Figure 3:** Map showing designated sites, Scheduled Ancient Monuments (red) and Listed Buildings (blue). The Abbey Consols study area is shown in purple. The red circle is the 2km search area.

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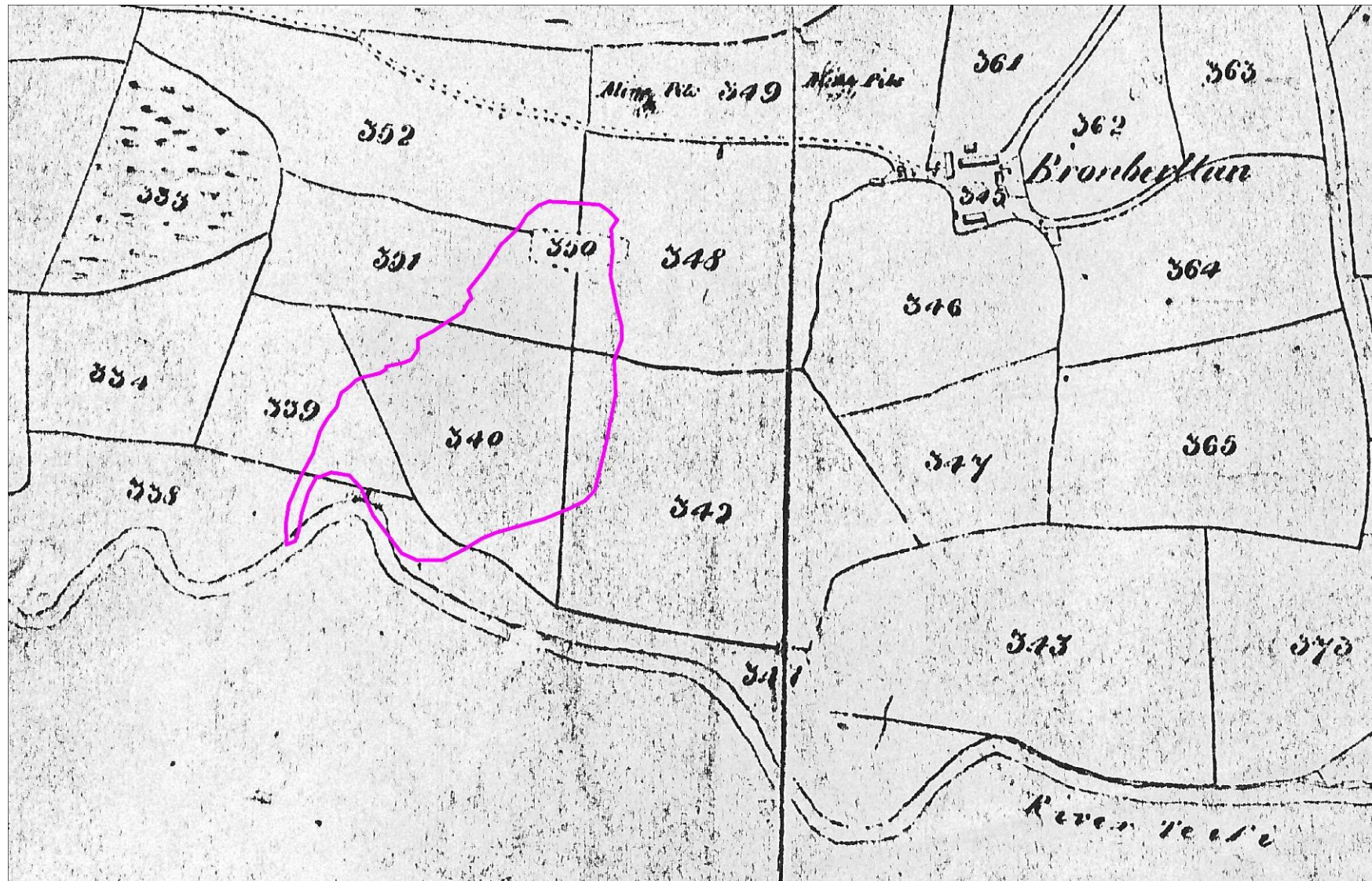


**Figure 4:** Non-designated archaeological sites within the study area (purple) recorded on the Dyfed Historic Environment Record (red) and the National Monuments Record (green) overlaid on the 1906 Ordnance Survey map of the area.



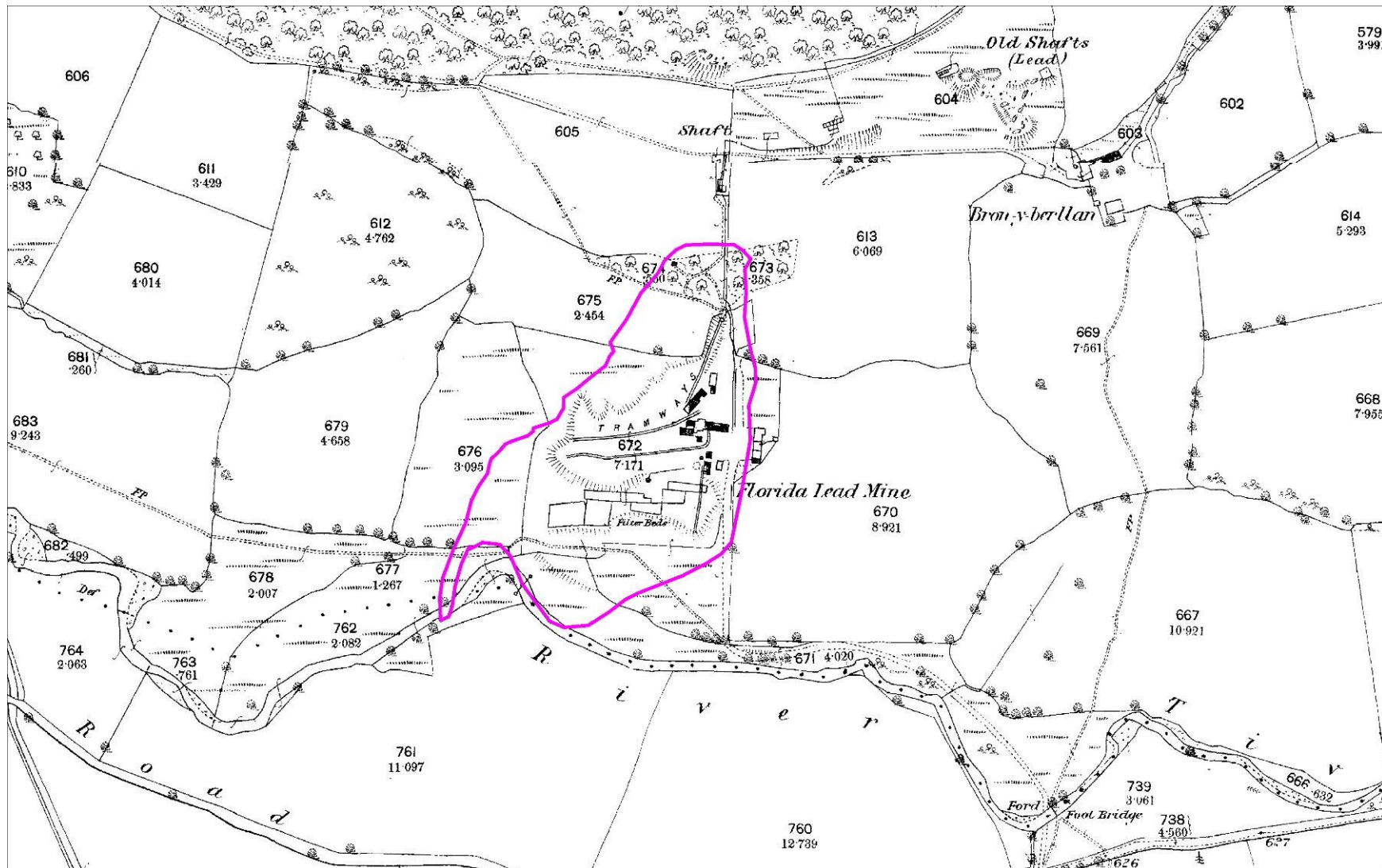
**Figure 5:** Newly identified sites within the Abbey Consols study area (purple) overlaid on the 1889 first edition Ordnance Survey map of the area.



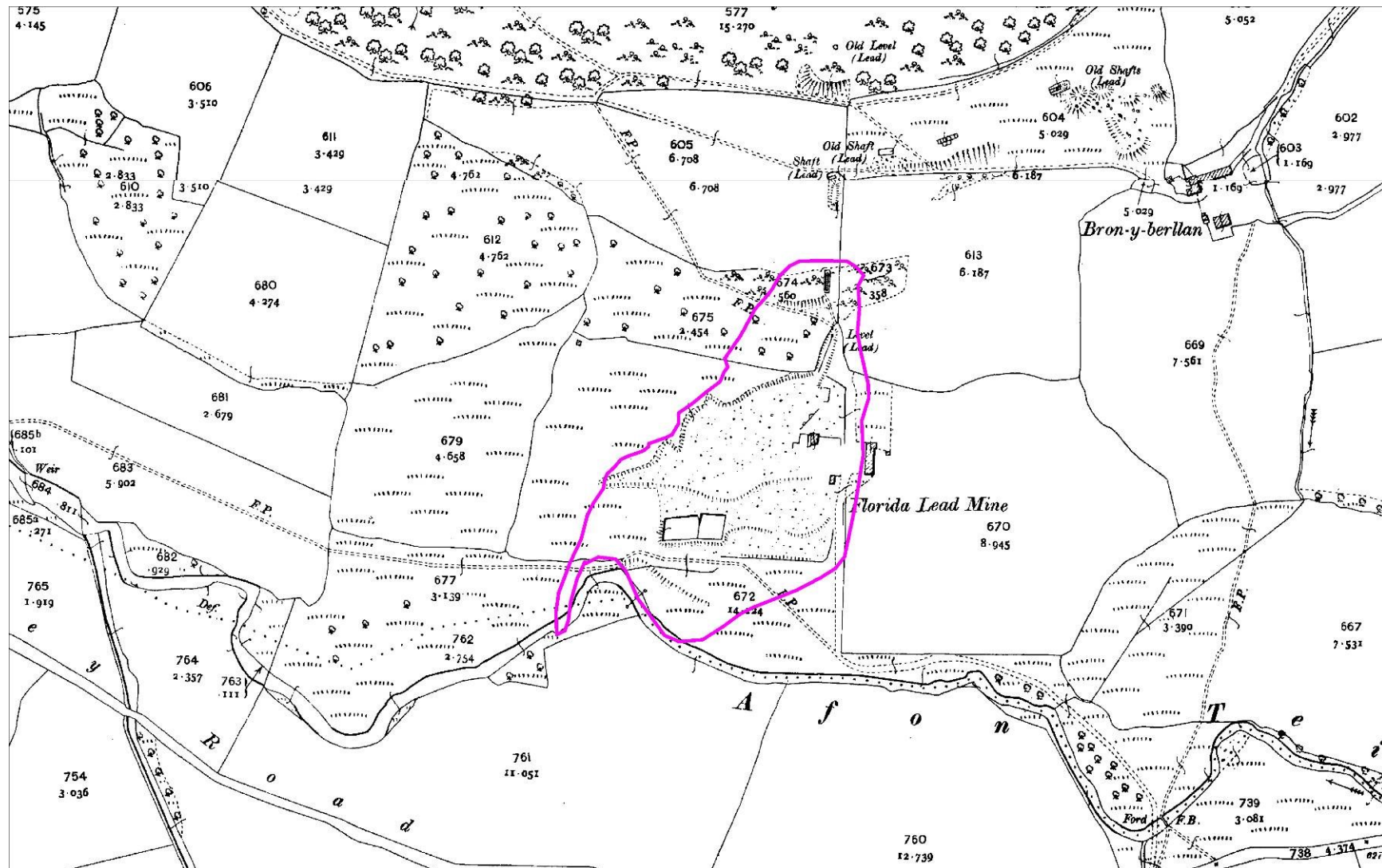


**Figure 6:** Extract of the 1847 Gwnnws parish tithe map with the study area outlined in purple.



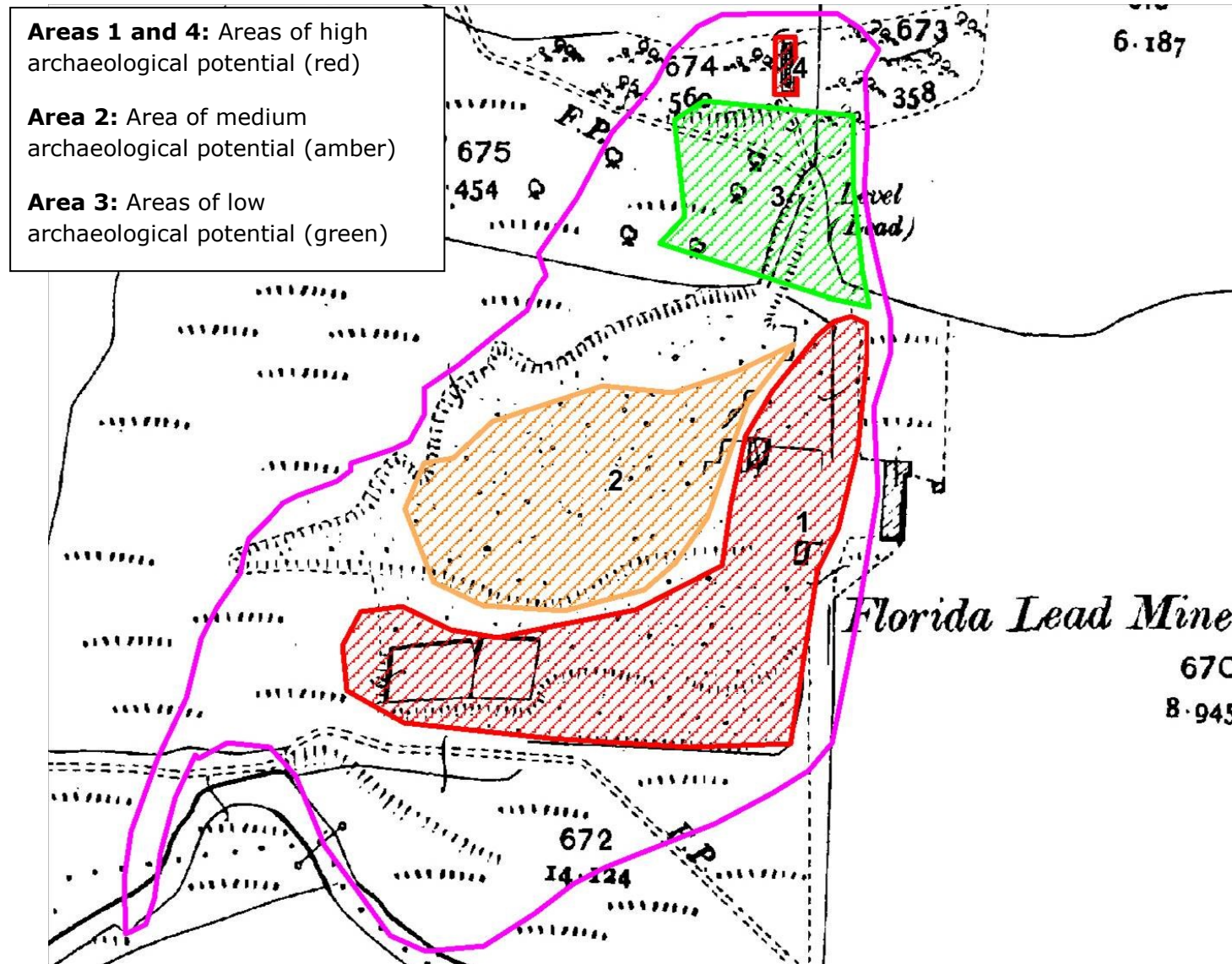


**Figure 7:** Extracts of the 1<sup>st</sup> edition Ordnance Survey 1:2500 map of 1889, with the study area outline (purple).



**Figure 8:** Extract of Ordnance Survey 1:2500 map published in 1906,  
with the study area outline (purple).





**Figure 9:** Abbey Consols mine plan of archaeological constraint overlying an extract of the 1906 Ordnance Survey map.

## PHOTOGRAPHS



**Photo 1:** Facing north towards modern quarry, showing ruined stone buildings with possible trace of wooden launders at base (Abbey Consols New Site 2). Also showing possible wooden stumps representing the remains of PRN 97684.



**Photo 2:** Facing southwest towards south-western corner of Abbey Consols. Taken from south-eastern corner of site from area of fine tips and tailings which represent the possible dressing floors (Abbey Consols New Site 1).





**Photo 3:** Facing north towards modern quarry from south-eastern corner of site, looking towards ruined stone buildings (Abbey Consols New Site 2 and PRN 97684). A modern drainage channel shows to the right of the photo.



**Photo 4:** Facing northeast from south-western part of Abbey Consols mine, to the west of PRN 97680 showing surface water issues.



**Photo 5:** Merged photos showing panoramic view from west to southwest, from top of ridge of the coarse dumps (PRN 97683) panning around to the southwestern corner of the site showing an overview of the area of fine tips and tailings representing Abbey Consols New Site 1.

## **APPENDIX 1: POTENTIAL MITIGATION MEASURES**

### **General Archaeological Mitigation**

At this stage there are no clear plans as to what form the mitigation could take on each site. A generic approach is laid out below. The full scope of the work will be dependent upon the scale and extent of the proposed remediation.

#### **Green Areas**

Where the archaeological potential is considered to be low within the mine site it is considered appropriate that an intermittent archaeological watching brief is undertaken during any groundworks. The aim of this work would be to have an archaeologist on-site on occasional visits to observe the progress of the groundworks and keep a check on the presence or absence of any archaeological remains. In the event that archaeological remains are revealed when an archaeologist is not on-site, they would be contactable by the site developer to then go out and record whatever remains are identified.

#### **Amber Areas**

The areas of moderate archaeological potential would also be dealt with through the implementation of a watching brief, though this would be more comprehensive than for the Green Areas. The aim of this work would be to have an archaeologist on-site regularly to observe the progress of the groundworks and keep a check on the presence or absence of any archaeological remains. In the event that archaeological remains are revealed when an archaeologist is not on-site, they would be contactable by the site developer to then go out and record whatever remains are identified. Should significant archaeological remains be revealed then there may be a requirement for a more detailed phase of archaeological recording to be implemented prior to development continuing in the area of archaeology.

#### **Red Areas**

Where remediation works are proposed in areas of high archaeological potential, ideally some form of archaeological evaluation would be undertaken in advance of development. This would usually take the form of trial trenches being excavated within the areas where groundworks are proposed to determine the presence of archaeology, its depth, significance, state of preservation and date. For the metal mine sites we can be confident that significant 19<sup>th</sup> century archaeological remains are present across the majority of the areas, although the one thing we cannot be sure about is the depth of those remains below the present ground surface.

A blanket approach to evaluation covering the Red Areas within the metal mine sites is not considered appropriate: intrusive groundworks associated with the remediation works are likely to affect only a small part of the areas. If more detailed plans of the remediation works become available, it may be possible to target specific areas for evaluation prior to ground works commencing, where deeper intrusions are proposed.

An alternative approach is proposed for the metal mines, whereby an intensive archaeological watching brief is implemented during all groundworks in the red areas, where a constant archaeological presence is maintained to observe groundworks and identify archaeological remains as they are exposed. It is suggested that at least one archaeologist is always present on-site, with a second on-hand or regularly present to assist with recording and the surveying of archaeological remains. Should significant archaeological remains be revealed then there may be a requirement for a more detailed phase of archaeological recording to be implemented prior to development continuing in the area of

archaeology (which could require more archaeologists and cause delays to the work programme within those areas where archaeology has been identified).

This is a more reactive approach than an evaluation, as the scale and scope of archaeological recording will be determined as and when such remains are exposed. The risk of this sort of work is that the eventual timescale of the archaeological watching brief and overall costs cannot be determined. The benefit is that it avoids the costs involved in undertaking a more random archaeological evaluation of the Red Areas prior to the groundworks commencing and the associated costs of post-excavation works, prior to the resultant phase of mitigation and further post-excavation works.

### **Discussion of potential mitigation at the three metal mine sites**

At Wemyss, it may be preferable to pursue a scheme of superficial water diversion by exploiting the stream which runs along the track at the western side of the site. Although this track is within the Red area (Area 1), limiting intrusive works to this watercourse would significantly reduce the impact to the archaeology here and it can be easily contained. The stream weaves through a dense area with little or no apparent impact on the visible structures and features there. By its very nature, it is an invasive feature and so has mostly likely already impacted upon any surviving archaeology and therefore it offers a convenient opportunity to limit disturbance to an area already disturbed. Any diversion, expansion or further intrusion of this water course will almost certainly impact on something however, and will need to be watched. However, if it is possible to limit any drainage to this stream without greatly exceeding the capacity of the watercourse, then it may be possible to reduce the archaeological mitigation in this area to an intermittent watching brief. Any new intrusive works elsewhere on the site will require watching, the intensity of which can be determined by the significance rating of the area.

Esgair Mwyn however, is a more complex situation and cannot perhaps be as easily resolved. If the remediation works here also involve superficial water drainage then it seems unavoidable that this will impact upon a red area. There are existing streams and rivulets in these areas but unlike that singular case at Wemyss, these are directly impacting upon archaeological features. Similar to Wemyss, any intrusive works will need to be watched and the intensity of which can be determined by the severity of the significance.

The situation is much simpler at Abbey Consols. Here, the site is much smaller, the archaeology less diffuse and well defined. Whilst concerns of superficial water and drainage do fall into a red area (Area 1) this is more localised and easier to target for mitigation. A great deal of impact can be reduced if the modern drainage channel is utilised but as like Wemyss, any diversion from this anywhere in that area will require watching. If remediation works can largely be contained to the modern drain then it may be more appropriate to target evaluation trenches where it is necessary to divert from the drain. However, if these intrusions are small, perhaps they would be adequately dealt with the remit of a watching brief.

Overall, owing to the scale of the sites, the diversity and quantity of archaeology a reactive programme is not only more likely to be cost efficient but will provide a more pragmatic approach to mitigation.



**APPENDIX 2: METAL MINE REMEDIATION PROJECT: ARCHAEOLOGICAL  
ASSESSMENTS OF ABBEY CONSOLS; ESGAIR MWYN AND WEMYSS MINES  
WRITTEN SCHEME OF INVESTIGATION**

**1 INTRODUCTION**

- 1.1 This written scheme of investigation presents a proposed methodology for archaeological assessments of three former metal mines in Ceredigion; Abbey Consols (SN 74304 66123); Esgair Mwyn (SN 75469 69293); and Wemyss (SN 71579 74089). The assessments have been requested by Natural Resources Wales within an *Invitation To Quote*, with description of the requirement stated as being: *To inform the option appraisal process for each of the 3 sites, NRW is seeking an archaeological consultant to undertake an archaeological assessment so that a better understanding of each site's historic interests can be gained.*
- 1.2 The assessment will be a primarily desk-based study of the site area, identifying any known archaeological or historical features within the mine sites and their immediate environs, identifying potential setting impacts on scheduled ancient monuments or listed buildings in the vicinity, identifying any historic landscape areas that may be affected by the proposals and assessing the potential for hitherto unknown archaeological remains to be present within the remediation areas.
- 1.3 The three mines are all historically significant sites which have been subject to some previous historical research and investigation. The assessment will collate the most relevant facts about the sites and their most significant elements. Maps will be produced highlighting zones of archaeological sensitivity including any special features that could cause issues for any future metal mine remediation.
- 1.4 Study areas have been defined for the three sites as shown on the plan attached to the *Invitation To Quote*: Abbey Consols covering an area of c.3.3ha; Esgair Mwyn covering an area of c.16.2ha; and Wemyss an area of 11.9ha. The background information for the work within the *Invitation To Quote* notes that the desk studies should include not only the defined study areas (as above), but also potential passive treatment sites as laid out in studies of the Esgair Mwyn and Abbey Consols sites. These additional areas are not defined within the documents.
- 1.5 The specification is in accordance with the *Standard and Guidance for Archaeological Desk-Based Assessments* (Chartered Institute for Archaeologists (CIfA), 2014).
- 1.6 DAT Archaeological Services staff have considerable experience of Metal Mine sites, having prepared the 'Metal Mining in Upland Ceredigion' booklet; undertaken a previous assessment and subsequent stages of evaluation and excavation at the Frongoch Lead mine for NRW; and production of the 'Cwmystwyth Mines Management and Protection Plan' for the Cwmystwyth Mines Trust
- 1.7 The Trust 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.
- 1.8 This document provides details on how DAT Archaeological Services intend to fulfil the requirements laid out in the *Invitation to Tender* and is intended for NRW only and must not be shown to any third parties.
- 1.9 ***Dyfed Archaeological Trust is a CIfA Registered Archaeological Organisation.***

## 2. AIM AND OBJECTIVES OF THE PROJECT

2.1 This document provides a scheme of works for:

***The preparation of an archaeological assessment for three metal mines in Ceredigion: Abbey Consols; Esgair Mwyn; and Wemyss. The reports will collate existing information and identify the most significant elements of the mine sites and provide at least one plan of each mine identifying zones of archaeological sensitivity or any specific features of high significance. The assessments will be provided for use in the development of the scope of future environmental remediation works required at the mines.***

2.2 Provision of a written scheme of investigation to outline the methodology by which DAT Archaeological Services will undertake the appraisal.

2.3 To identify any known archaeological remains and their significance, as well as identify the potential for hitherto unknown archaeological deposits to be present within the mine areas, highlighting any features or areas of high sensitivity.

## 3. ARCHAEOLOGICAL ASSESSMENT METHODOLOGY

3.1 The archaeological assessment will involve the preparation of a stand-alone report. The report will be prepared using relevant information from a number of sources, and will comprise a number of elements, including:

- Dyfed Archaeological Trust Historic Environment Record data and other relevant information (including a review of online information held on the RCAHMS Coflein site) – minimum search area will be that as defined within the tender documentation;
- Identification of any Scheduled Ancient Monuments, Listed Buildings, Conservation Areas or Historic Landscape Areas within or in the vicinity of the site area from information held by Dyfed Archaeological Trust, CADW and NRW (formerly CCW) – 2km search area;
- Readily available bibliographic information, cartographic material and photographs (including aerial photographs) held at the Trust;
- A review of historic maps to include a map regression exercise;
- Relevant web-based information;
- Site visit and walkover survey;
- Consultation with the Welsh Mines Preservation Trust (namely Graham Levins) regarding each site and identification of any specific features of high significance;
- Consultation with Robert Protheroe-Jones, curator of Heavy Industries at Amgueddfa Cymru National Museum of Wales, and a Trustee of Dyfed Archaeological Trust;
- A consideration of underground features of the mines; and
- Assessment of the archaeological potential of the area.

3.2 The proposed sites visit would be undertaken to provide an assessment of the presence of any visible archaeological remains within the mine areas and possible identification of new features. Photographs will be taken of the site area and its environs and these will be used within the report.

- 3.3 The following will be considered when preparing the appraisal, although in some cases no such features may be present and will thus not be considered further:
- Scheduled Ancient Monuments {SAMs} and their settings;
  - Non-scheduled ancient monuments and their settings;
  - Listed buildings and their settings;
  - Non statutory Buildings of Local Importance, where this information is readily available and relevant to the proposed development;
  - Registered Parks and Gardens and their essential settings;
  - Registered Historic Landscapes;
  - Non-registered historic landscapes;
  - Buried archaeological potential;
  - Palaeo-environmental potential;
  - Newly identified sites of historic importance;
  - LANDMAP and landscape characterisation information.
- 3.5 A report will be prepared on the results of the assessment. This report will include information on known sites within and in the vicinity of the proposed development site. Maps of known archaeological and historical sites will be presented in the report. Photographs will be used where appropriate.
- 3.6 The report will be fully representative of the information gained from the above methodology and will include the following:
- A concise non-technical summary of the assessment results.
  - The report will contain at least one plan showing the site's location in respect to the local topography.
  - The report will list all the sources consulted.
  - The report will contain at least one plan showing zones of archaeological sensitivity for each of the mine sites, including any specific highlighted features.
  - Map regression exercise using all readily available maps of the sites; and
  - An assessment of the relative value or significance of each recognised historic asset.
- 3.7 Once completed, copies of the report will be submitted to NRW. A further copy of the report should be provided to the Dyfed Archaeological Trust for deposition within the Regional Historic Environment Record (HER).
- 3.8 Where appropriate, a summary report on any new significant archaeological discovery will be submitted for publication to a national journal (e.g. Archaeology in Wales) no later than one year after the completion of the work.
- 3.9 The assessment and maps showing zones of sensitivity need to be completed and submitted to NRW prior to the 29<sup>th</sup> February 2016.
- 3.10 The consultees noted above have extensive knowledge of these metal mine sites and will be invaluable in highlighting any features of special significance or areas of sensitivity which are not readily identifiable from map regression.

#### **4 STAFF**

- 4.1 The project will be managed by J Meek MCIfA, Head of DAT Archaeological Services.
- 4.2 The reports will be prepared by members of DAT Archaeological Services staff with experience of metal mines site, namely James Meek (MCIfA), Frances Murphy (ACIfA pending) or Duncan Schlee (summary CVs provided below). A second member of DAT Archaeological Services staff will be used for the site walkover survey for health and safety reasons.

#### **5. HEALTH AND SAFETY**

- 5.1 All permanent members of DAT Archaeological Services staff are CSCS<sup>2</sup> registered.
- 5.2 DAT Archaeological Services will carry out a health and safety risk assessment prior to any site visits to ensure that all potential risks are minimised.
- 5.3 All relevant health and safety regulations must be followed.
- 5.4 All site inductions, H&S procedures, H&S constraints and site rules of the client or any on-site contractor will be made known to DAT Archaeological Services staff prior to any site visits being undertaken.
- 5.5 Safety helmets, high visibility vests and boots are to be used by all site personnel as necessary when on-site visits. Two members of staff will undertake each of the site visits as the sites are remote and potentially dangerous.
- 5.6 The site visits will not include any subterranean parts of the mine sites.

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<sup>2</sup> Construction Skills Certification Scheme (Health and Safety Tested)

# **METAL MINE REMEDIATION PROJECT PART 1: ABBAY CONSOLS ARCHAEOLOGICAL ASSESSMENT**

RHIF Y DIGWYDDIAD / EVENT RECORD NO. 109181  
RHIF YR ADRODDIAD / REPORT NUMBER 2016/05 Part 1

Mawrth 2016

March 2016

Paratowyd yr adroddiad hwn gan / This report has been prepared by

Menna Bell

Swydd / Position: Archaeologist

Llofnod / Signature .....



Dyddiad / Date 18/03/2016

Mae'r adroddiad hwn wedi ei gael yn gywir a derbyn sêl bendith  
This report has been checked and approved by

James Meek

ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.  
on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position: Head of DAT Archaeological Services

Llofnod / Signature .....



Dyddiad / Date 18/03/2016

*Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadau  
sydd gennych ar gynnwys neu strwythur yr adroddiad hwn*

*As part of our desire to provide a quality service we would welcome any  
comments you may have on the content or presentation of this report*

