

### **Requirement 21 Archaeology**

Overarching Written Scheme of Investigation for Archaeological Mitigation



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#### **Report for**

Snowdonia Pumped Hydro

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# 1. Introduction

#### 1.1 Project Background

- 1.1.1 Snowdonia Pumped Hydro ("the Applicant") was granted a Development Consent Order ("DCO") for the construction and operation of a 99.9MW pumped storage scheme by the Secretary of State for Business, Energy and Industrial Strategy on 8 March 2017, named the Glyn Rhonwy Pumped Storage Generating Station Order 2017.
- 1.1.2 An Archaeological Compensation and Enhancement Strategy (PINS Reference EN010072) was prepared for the DCO application to comply with the requirements of Regulation 5(2)(q) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 and in accordance with the Department for Communities and Local Government guidance 'Planning Act 2008: Application Form Guidance' and the Planning Inspectorate Advice Note 6 on Preparation and Submission of Application Documents.
- 1.1.3 This Written Scheme of Investigation (WSI) responds to the Archaeological Compensation and Enhancement Strategy (PINS Reference EN010072) and sets out the archaeological approach to the disturbance of remains resulting from work carried out at the Glyn Rhonwy Pumped Storage Generating Station development site. It is intended to provide an introduction to the overall scheme, archaeological background, and regional research agenda, as well as setting out the overarching procedures and standards for archaeological works.

#### 1.2 Project Roles

- 1.2.1 Snowdonia Pumped Hydro and is responsible for ensuring that the agreed scheme of works set out below is implemented.
- 1.2.2 An Archaeological Contractor or Contractors will be appointed by the client or main works contractor to implement the agreed scheme of works set out below. The archaeological contractor will prepare any required Archaeological Methods Statements, carry out archaeological works to the standards set out below, produce any necessary reporting and deliver the agreed outreach scheme.
- 1.2.3 The archaeological contractor will produce detailed Archaeological Methods Statements for each area identified in Table 4.1 below to confirm their acceptance of the standards set out in this WSI and to define the final area of investigation for each area.



# 2. Archaeological and Historic Background

#### 2.1 Chronological summary

- 2.1.1 The historical and archaeological baseline inserted below has been provided by AECOM within the 'Glyn Rhonwy Pumped Storage Development Consent Order Environmental Statement Volume 2, Chapter 11 Archaeology and Cultural Heritage':
- 2.1.2 The 1km study area was taken from and refined to the Order Limits. Within the 1km study area, 280 historic assets were recorded from the Gwynedd Archaeological Trust HER and the Coflein database run by the RCAHMW. Four of these sites are recorded but not plotted due to limited location information. An additional 38 sites were recorded from analysis of historic mapping, aerial photographs, and during the walkover survey. Eleven numbers in the known archaeology table were not used as further investigation found the assets they represented to be duplicates of assets already recorded. Within this chapter, the bracketed numbers after site descriptions relate to those in Volume 3 Appendix 11.1 and in Volume 4 Figure 11.1.
- 2.1.3 For the purposes of this WSI, the on-site historic assets are shown in Figure 2.1, which also shows the project's works plans.

#### **Designated Sites**

- 2.1.4 There is a single Scheduled Monument recorded within the immediate study area, which consists of the earthwork remains of a collection of prehistoric hut circles at Gallt-y-Celyn (1). There are also two listed buildings, both of which are Grade II listed and associated with Glyn Padarn. The first is the lodge (2), while the second is the screening walls surrounding the house (3).
- 2.1.5 There are no, Registered Parks and Gardens, Registered Battlefields, or Conservation Areas within the 1km study area. However, the Development site is located immediately outside of the Snowdonia National Park, and the Development site is also located within the Dinorwig Registered Historic Landscape of outstanding historical interest (HLW (Gw) 6).
- 2.1.6 The Slate Landscape of Northwest Wales was added to the UNESCO World Heritage List in 2021. The Glyn Rhonwy Pumped Storage Generating Station is adjacent to The Slate Landscape of Northwest Wales Component Part 2: Dinorwig Slate Quarry Mountain Landscape, which is one of the six parts of the landscape.

#### **Historic Landscape Characterisation**

2.1.7 The current Development area is included in the landscape examined by Gwynedd Archaeology Partnership for their Historic Landscape Characterisation Project. The Development site falls into Area 6, the Glynrhonwy Quarries, and forms the southern limit of Cadw's undesignated Landscape of Historic Interest Number 24 where it is classed as the Dinorwig Quarry Landscape. The Glynrhonwy Quarries are described as:"Quarry machinery comprehensively removed in 1930. Some lower tips recently removed and landscaped, and mill complex is in reuse for the manufacture of climbing equipment. Wartime bomb store includes concrete roof covered with slate rubble and traces of



sidings. Elsewhere stone embankments for ropeways into pits, and inclines, remain as impressive features." (GAT 2000a, 40).

- 2.1.8 Conservation priorities and management issues were considered to be the "preservation of the quarry landscape in its integrity, including tips" (ibid 2000a, 40).
- 2.1.9 GAT has also undertaken a review of all quarry sites in an attempt to assess the condition of slate mining sites and aid their preservation. A total of eight quarries and elements of their infrastructure were identified within the study area, of which three are located within the Order Limits. These three sites are the Cefn Dû (Q1/2, site 54), Chwarel Fawr (Q1, site 281) and Bryn-Mawr (14-16). All sites assessed were given a category rating between 1 and 5, with the Cefn Dû area categorised as 2, and the remaining two quarry complexes considered to be Category 3. The five sites outside of the Development area, but within the study area, consisted of the Cook and Ddol Quarry (177) and the Glyn Rhonwy Upper Quarry (241), both of which were graded Category 2, and the Bwlch-y-Groes Quarry (47), Caermeinciau Quarry (50), and Cambrian Quarry (52) which were classified as Category 3. The Glyn Rhonwy Lower Quarry (Q8) was not categorised as a separate quarry in the report. These categories are defined as the following:
  - Category 2 Site or remains of National (Welsh) archaeological importance. A substantial range of quarry buildings, structures, and some machinery, but with few or no features of special merit.
  - Category 3 Sites or remains of Regional (Gwynedd) archaeological importance. A quarry with associated structures of which only foundations remain.

#### Prehistoric (to AD 43)

- 2.1.10 There are a total of six recorded sites of prehistoric date. Of these, five have been narrowed down to more specific dates with one dating to the Bronze Age and four dating to the Iron Age, although the remaining undated site is assumed to be Iron Age.
- 2.1.11 The earliest evidence for activity within the study area is in the form of a Bronze Age axe found near the Glyn Rhonwy quarries (226). Although only a find spot, the item represents evidence of early activity, and it is possible that sites associated with prehistoric land use have been removed by subsequent mining and quarrying.
- 2.1.12 The main evidence for prehistoric activity within the study area is largely associated with settlement activity with a number of clusters of hut circles recorded on the uplands surrounding the Development site. These include the cluster at Gallt-y-Celyn, which is also a Scheduled Monument (1), and a collection of huts at Maen-Llwyd (269). Three grouping of huts have been dated to the Iron Age at Gallt-y-Celyn (1), Ffridd-Glyn (212), and Dinas Ty-Duand (192). This latter site is also located near the Iron Age hill fort of Dinas Ty-Du (190) to the south.
- 2.1.13 It is also possible that the mining of slate within the study area commenced during the prehistoric period as it is known that exploitation of the resource took place from at least the Roman period with the nearby fort of Segontium at Caernarfon, approximately 7.5km to the west, constructed of the material (Roberts 2006, 74). However, such exploitation would be difficult to detect due to later workings.

#### Roman (AD 43 to 450)

2.1.14 Roman activity within the study area is limited with only two previously known assets recorded. These consist of a number of hut circles on the lower slopes of Dinas Ty-du to the south (251) and part of the Roman road from Segontium to Bryn-y-gefeiliau (259). A number of the Iron Age sites recorded within the study area might also have continued to



be occupied into the Roman period, although a lack of fieldwork means that many sites are undated.

- 2.1.15 The route of the Roman road is speculative with no firm evidence for the road identified through excavation. It has been suggested that the road may run over a low ridge between Cefn Dû and Bryn Mawr, which would position the road near the eastern and southern limits of the Order Limits (Waddelove 1999, 286). However, no firm evidence of this route has been obtained through excavation or fieldwork.
- 2.1.16 As discussed above, it is also possible that exploitation of the slate resources in the area was taking place from the Roman period (Roberts 2006, 74), although such activities would be very difficult to identify due to subsequent mining and quarrying operations.

#### Early Medieval (AD 450 to 1066)

2.1.17 There are no previously recorded archaeological sites dating to the early medieval period within the study area, although it would seem likely that the upland area continued to be used during this period for agriculture. It has been suggested that at least some of the prehistoric round houses recorded on the high ground may have been used into the 5th and 6th centuries AD (GAT 1999a, 4). It is also possible that slate mining took place during this period as many prestigious buildings were using slate as the main building material (Richards 1995, 12), although which quarries were being exploited is uncertain.

#### Medieval (AD 1066 to 1500)

- 2.1.18 As with the early periods, sites dating to the medieval period within the study area are limited with only eight assets recorded. These sites are again concentrated on the uplands surroundings the site and are associated with the agricultural communities who were living in the area during this time.
- 2.1.19 It is clear that by this period a settlement had been established to the southeast of the Order Limits in what is now known as Llanberis, although at this period the village was known as Coed y Ddôl (Owen 1998, 46). A smaller settlement known as Nant Peris was located slightly further to the east of the main settlement on the strategically important transport route of the Llanberis Pass which ran through the mountainous area which contained limited transport routes. The village is reported to have taken its name from Saint Peris who is reported to have had a church or cell in the area in the 11th and 12th centuries (ibid 1998, 46). Llanberis later took its name from the smaller settlement of Nant Peris, although it remained centred on the village of Coed y Ddôl (Roberts 2006, 73).
- 2.1.20 As mentioned above the settlement formed an important location on the Llanberis Pass and documentary evidence records that Dolbadarn Castle, located at the eastern limit of the village, was built in the early 13th century by the Welsh prince Llywelyn the Great (Roberts 2006, 73). The castle fell to the Earl of Pembroke in 1282, though the village survived as a small settlement (Roberts 2006, 73).
- 2.1.21 All of the previously recorded historic assets within the study area are related to the upland settlement and agriculture and include a number of long house platforms, including examples at Barrack-Mawr (4), Dinas Ty-Du (193) and Ty'n-y-Mynydd (295). Other structural remains have also been recorded at Garreg Lefain (46), Cefn Dû (56), Chwarel Cefn Dû (121), and Ffridd-Glyn (211).
- 2.1.22 Although no remains dating to this period have been recorded, it is possible that many of the quarries were worked in a small-scale way. From at least the 14th century slate was being exported, while from the 15th century the material was becoming common for roofing (Richards 1995, 12). However, traces of many of these early mining sites may



have been removed by later large-scale mining enterprises, while other quarry sites would be hard to date due to the minor changes in the methods of extraction employed.

#### Post-Medieval (AD 1500 to 1899)

- 2.1.23 The post-medieval period marks a dramatic change in the activities taking place in the study area, and the period certainly includes the largest number of known historic assets, with 209 previously recorded post-medieval sites identified. A further 21 assets have been dated to the post-medieval or modern period.
- 2.1.24 The use of the uplands for agriculture within the study area continued to take place throughout the post-medieval period with a number of farmsteads (210, 211, 261 & 292) (see Photographs 11.1 and 11.2 in Volume 3 Appendix 11.2) recorded along with associated infrastructure such as sheepfolds (188, 189, 194-197, 217, 220 & 297-299) and field boundaries.
- 2.1.25 The upland nature of the landscape meant that the area was also suitable for transhumance, the seasonal use of upland pasture, which involved taking livestock onto the high ground to take advantage of the spring and summer grazing and conserve the lowland arable land. In Wales the terms Hafod, Hafoty, and Hafotai all signify shieling grounds or summer pastures (Tomas 2005, 25) and this name appears in a number of locations on the slopes of Cefn Dû. These include Hafod Oleu Isaf to the west (SH 5346 5975), Hafod Owen to the northwest (SH 5331 6179), Hafod Lydan to the southeast (SH 5739 5940) and Tan-Hafotty to the northeast (SH 560 610). It seems highly likely that this use of the uplands continued into the western, or upland, sections of the Order Limits, although traces of the small structures associated with the practice may have been removed by subsequent mining.
- 2.1.26 The clearest evidence for activity within the Order Limits dates to the post-medieval period and is linked to the exploitation of natural resources in the area. Slate had been quarried from the hills surrounding the study area from at least the Roman period due to the materials suitability for construction (Roberts 2006, 74). The exploitation seems to have continued in a piecemeal fashion until the late 18th and early 19th century when documentary and cartographic evidence notes that a number of the quarries within the study area were being worked. Indeed, the importance of the material can be clearly seen in Gwynedd with over 400 quarry sites identified (Gwyn 2006, 42).
- 2.1.27 Up until the late 18th century much of the uplands were considered Crown Common with areas leased on a small scale for localised slate extraction with men working for a ninth of the slate extracted (Dodd 1971, 209). However, by the 1790s the value of slate extraction had been recognised which resulted in large areas being leased to the local gentry who invested in the sites and set about erecting features such as pumps, waterwheels, and other machinery to aid their ventures (ibid 1971, 209-210). A number of quarries are recorded within the Order Limits and are named, from west to east, Chwarel Fawr (281) (Photographs 11.3 & 11.4 in Volume 3 Appendix 11.2), Cefn Dû (54), Cook and Ddôl (177), and Glynrhonwy (238).
- 2.1.28 The earliest survey of the area identified was the 1841 Tithe Plan of the Parish of Llanberis (CA 2 Tithe 28). This survey lacks any significant detail and fails to show any of the quarries although it marks the Victoria Hotel in Llanberis, along with a number of buildings scattered throughout the area of the quarries which presumably represent quarry buildings. The survey also depicts the farmstead of Tynewydd which still survives (313), as well as the farmsteads of Caerfran (314), Dol Tydu (not accurately located), and the Dol Padarn Inn (316).

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- 2.1.29 The next detailed survey of the area identified as part of the current research dates to 1858 and accompanies a document inviting prospective interested parties to take on a share in the quarry (CA XD2/12831). At the time of the document the quarry is reported to be leased to Mr Hussey Taylor of Llanberis who proposed to open new quarries on the lower slopes above the lake side road from Caernarvon to Llanberis, as well as rework the older quarries known as Chwarrel Fownog and Chwarrel Fain. The reworking of the aforementioned quarries required the construction of a new tunnel depicted on the plan, and the plan also shows that the lake edge had been used extensively for slate working with "waste deposited in Llyn Padarn". This survey also shows a number of small buildings near the main road and the rubbish ground or slate making area which were presumably used by slate workers, along with a number of reservoirs higher up the hill to the west. However, it has not been possible to accurately relate many of these sites with features surviving as ruins or earthworks due to the large number of sites within the area.
- 2.1.30 It is assumed that working continued at the site as a second survey, dated 1860, outlines proposals by Captain Hussey Taylor to re-route an existing private road running across the area of slate workings (CA XD2/12833). However, this survey is hand drawn and limited in detail, although it does mark one of the structures by the road as an 'old office' with a garden adjacent, along with a danger flag near the edge of the workings.
- 2.1.31 In the years that followed the importance of slate extraction in the area continued to grow, with a number of quarries within the Order Limits owned and managed by wealthy men who held the leases to the workings. By the 1880s the number of men working in the quarries was often considerable and a vast range of buildings were erected to undertake tasks such as cutting, tool making, and to house engines used for transporting the slate (Richards 1995, 78-79). Figures dating to the last quarter of the 19th century state that in 1872 Glynrhonwy Lower employed 200 men who mined 8,000 tonnes of slate, while Glynrhonwy Upper employed 40 men (Lindsay 1974, 321). By 1882 the lower site seems to have dropped in importance employing only 53 men and producing 1,514 tonnes of slate while the upper site employed 90 men and extracted 2,181 tonnes (ibid 1974, 321).
- 2.1.32 Figures for other quarries within the Order Limits also point at the importance of the quarries with the Cefn Dû quarry employing 197 men who extracted 5,640 tonnes of slate in 1882 (ibid 1974, 313). In the same year the smaller Cook and Ddôl Quarry employed 26 men who extracted 616 tonnes in 1882 (ibid 1974, 315). It is clear that such large operations required a major network of structures to support the industry and in 1879 the Llanberis Slate Company who operated Cefn Dû, as well as two other quarries, had four fixed steam engines, one tramway locomotive, two steam rock drills, two waterwheels with turbine hoisting kit, steel wire and ropes, and a large number of slate and rubble wagons (ibid 158). These features have not been located but it is likely that the remains of buildings that are littered over large areas of the Order Limits house items such as those listed above.
- 2.1.33 The first accurate survey of the area is the 1888 Ordnance Survey plan which shows the Order Limits as being extensively used for slate quarrying (Volume 4 Figure 11.3). This survey names a number of different quarries, although the lower area is depicted as a combined unit under the name Glyn-rhonwy Slate Quarry. A large number of structures are recorded across the Development site which presumably relate to slate quarrying, and although most are unnamed there is a smithy (306) and a magazine (307) marked near the minor road which still runs near Tynewydd. The smithy site can still be observed as a ruin amongst trees near the edge of the road. A large number of inclines on both the north and south side of the workings are also depicted along with a possible winding house on the long southern incline, while the tunnel proposed by Hussey Taylor in 1858 also seems to have been constructed.



- 2.1.34 The development of the landscape is not just confined to the lower quarries as the survey also depicts a large complex of buildings on the upper slopes around Chwarel Cefn Du slate mine and the Cook and Ddôl Slate Quarry. A large building named as Barrack-mawr is also recorded in the upper area, and this appears to represent a barrack used to house quarrymen (8). Such buildings were constructed on quarries with the men arriving on a Monday morning and living on site until the Saturday afternoon when they would return home, thus saving them the long walk home after every shift (Richards 1995, 68).
- 2.1.35 Further land reclamation resulting from the dumping of slate waste in Llyn Padarn occurred on the shore edge (301), while a series of workshops also appeared to have been constructed on the lake edge (302). A railway had been constructed along the shore edge (309), while a wharf is depicted to the southeast of the man-made land mass that is observed jutting into the lake (303). The railway is recorded as being in operation from as early as the 1830s to transport slate from Llanberis to Port Dinorwic, although the quarries at Glynrhonwy continued to use farmers to transport slate as late as the 1840s/50s (Dodd 1971, 217-218).
- 2.1.36 A continuing reliance on agriculture as well as mining is also supported with a number of farms depicted either side of the quarries, along with sheepfolds used for the management of livestock. These include Pen-gilfach to the north and Glyn-rhonwy (311) and Beudy-y-geifr (312) to the south. It is also clear that the settlement of Llanberis has also expanded as a result of the quarrying in the area.
- 2.1.37 Very few major changes appear to have taken place by the time of the 1899 Ordnance Survey of the area, although it is clear that the quarries continued to develop and increase in size (Volume 4 Figure 11.4). A number of new structures are recorded, while many on the inclines appear to have increased in size. The complex of structures at Cae-ty (also referred to as Cae'r-ty) also seems to have grown dramatically, although the exact purpose of these buildings is not known.
- 2.1.38 The most striking change appears to be on the edge of Llyn Padarn where the workshops that were depicted on the 1888 survey had been regulated to form a long line of buildings alongside a large rail terminal and marshalling yard (302). Further dumping into the lake had also increased the size of the manmade landmass, while a rail system with associated structures was established on the reclaimed area to aid in dumping of waste slate into the lake (304 & 305).
- 2.1.39 The importance of slate mining and the impact it had on the archaeological record can be seen in the known archaeology of the study area with the majority of the 209 assets recorded relating to the slate industry. These assets include workers hostels (8) (see Photograph 11.5), shelters (27, 29, 30, 124 & 144-150), tramways (39, 113, 134 & 162-166), inclines (122 & 123) (see Photographs 11.6-11.8), and other structures such as explosives stores (119 & 210), winding houses (139, 140 & 237), and general quarry buildings (126-131) (Photographs 11.4 & 11.6).
- 2.1.40 The spiritual needs of the workers and their families were met with a number of chapels and churches constructed during the growth of the slate mining industry and the settlement of Llanberis. New churches included Clegir Chapel (176), Fach-Wen Chapel (204), and Preswylfa Chapel (268) all of which are Calvinistic Methodist chapels, Nant Padarn Welsh Independent Chapel (257), and Seion Baptist Chapel (274).

#### Modern (AD 1900 to present)

2.1.41 Although the importance of slate had fluctuated in the 19th century due to outside pressures, such as the wars with the French and the industrial revolution (Richards 1995, 115-117), a downturn in the latter years of the 19th century resulted in strikes at a number



of quarries including Glynrhonwy (Merfyn-Jones 1999, 109-113). However, the quarries around Llanberis continued to operate with extraction continuing into the 20th century, and a number of the 68 assets assigned to the modern period, as well as the 21 assigned to the post-medieval and modern period, are associated with quarrying.

- 2.1.42 The 1914 Ordnance Survey of the area shows some signs of the continuing development of the area as a result of quarrying, as the man-made island in Llyn Padarn expanded further and a number of new structures appeared on the island (308) (Volume 4 Figure 11.4). However, it also appears that some of the lower quarries had reduced in their extent as one incline that operated in this area is marked as 'old incline'. However, the main quarries appear to be still operating although there have been very few noticeable changes to the buildings and infrastructure that was associated with the quarries.
- 2.1.43 In 1919 the Upper Glynrhonwy Quarry purchased the Lower Glynrhonwy Quarry and the Premier Glynrhonwy Slate Quarries Company Limited was formed (Lindsay 1974, 321). However, the end of slate quarrying within the study area was nearing and by the early 1930s a number of the large quarries closed including Cefn Dû and Glynrhonwy, both of which ceased operations in 1930 (ibid 1974, 158, 321). When the former closed the plant was dismantled and auctioned with the sale including a store house, a powder magazine, sheltering sheds, miners hut, and dinner sheds, providing some idea of the structures that were used until the final years of operations (ibid 1974, 158). The Cook and Ddôl Slate Quarry lasted a little longer but it had also closed by 1937 (ibid 1974, 315).
- 2.1.44 The closure of the quarries at Glyn Rhonwy did not, however, mark the complete end of slate exploitation within the study area. The closure of the mines and the depression of the 1930s resulted in many former quarrymen, and their families, struggling to survive and some turned to the slate tips associated with the quarries as a source of income (Gwyn 2015, 74). Slate that had in the past been overlooked as it was not considered to be of a good enough quality or large enough for building, was now reworked for products such as damp-proof courses, which required smaller pieces of slate. Although this re-working can be hard to identify, narrow pieces of waste slate, such as those encountered at the Chwarel Cefn-Du quarry (141) can suggest later damp-proof course production. Furthermore, small structures were often erected by the men reworking the material in the tips, and possible examples of shelters have been recorded at a number of locations across the study area (270, 271 & 323).
- 2.1.45 Although slate quarrying had largely ended by the middle of the 20th century the lower mines were reused during the Second World War as a munitions store which opened on the 2nd June 1941 (Sloan 1991, 140), and formed part of RAF Llanberis (319) (Photographs 11.9 & 11.10). The site included a large underground munitions store (239), belting sheds where female workers placed ammunition into belts, and above ground storage areas (Chambers-Jones 1995, 39). The ammunition and bombs were brought in by train, with the above-ground storage involving bombs stored in clusters and covered by tarpaulin (ibid 1995, 39), and it is possible that a number of platforms apparent on a 1940s plan were areas set aside for above ground storage. Sections of the below ground storage seem to have been less successful as a large section of one of the stores collapsed on the 25th January 1942 (Chambers-Jones 1995, 37).
- 2.1.46 From May 1943 much of the work undertaken at the site involved destroying old and obsolete ordnance that could no longer be used operationally. This was achieved by constructing a chute into one of the quarries down which ordnance could be dropped resulting in the incendiary bombs catching fire and burning in the quarry bottom (Chambers-Jones 1995, 39). Between December 1943 and September 1944, a total of 173,000 25lb incendiaries and 88,000 4lb incendiaries were destroyed, while between September 1944 and December 1944 95 tonnes of incendiaries were destroyed (ibid 1995, 39-40). The use of the site for storage and destruction continued until 1956 when



the site finally closed, although work in the early 1970s revealed that not all the ordnance had been disposed of (ibid 1995, 71). This resulted in one of the quarries being drained of 20 million gallons of water so that a bomb disposal team could clear the site with the final clearance work finished in October 1975 (ibid 1995, 71).

- 2.1.47 A total of 89 previously recorded assets dating to the modern period or the post-medieval and modern period were recorded as part of the current work, with the majority associated with slate mining activities from the first half of the 20th century. These assets include bases from the aerial ropeways (17 & 20-24), quarry buildings (152 & 246-250), and tramways (162-164), and spoil heaps (158 & 284). However, the majority of assets recorded and dating to the modern period are associated with the Cefn Dû radio station. This site was the first successful Marconi long-wave transmitting station operating between 1912 and 1938, and was, for most of its life, the most important long-wave station in Britain.
- In all, over 45 structures relating to the radio station have been recorded including numerous buildings (57-61), concrete bases (63-96), trackways (100-105), and cables (62). The main military site recorded is the underground munitions store, which formed a major part of the RAF Llanberis complex (239).
- 2.1.49 A subsequent site visit in June 2022 revealed that the area of the RAF Llanberis complex (239) military site and Cefn Dû radio station has been significantly landscaped and is heavily overgrown to the extent where it was not possible to observe any identifiable remains, although the extent of modern landscaping strongly suggests that survival of any substantial military structures in this area is very unlikely. Entry to the munitions store via the tunnel confirmed that the structure is surviving, but in poor repair and with some internal elements inaccessible.

#### Sites of Unknown Date

- 2.1.50 There are nine sites of unknown date within the study area. A number of these may date to the prehistoric period and include clusters of possible hut circles at Gallt y Celyn (228) and a cairn at Carnedd Wen (51). A field clearance cairn at Cefn Dû may relate to agricultural improvements in the prehistoric or later period (55), as might a boundary bank at Bwlch-y-Groes (9), and a similar bank at Dinas Ty-Du (191).
- 2.1.51 The copper mines at Llanberis appear to date to the post-medieval period (255) as they are recorded as operating in the early 19th century, although they may also have been exploited during earlier periods (Hall 1952, 173, 183).
- 2.1.52 The remaining undated sites include a mound at Donen Las (199) and a spring at Barrack-Mawr (5).





# 3. Research Context

#### 3.1 Introduction

- 3.1.1 As mitigation by investigation and recording primarily mitigates loss of archaeological significance, it is important to set the results of any archaeological fieldwork into a wider framework for archaeological research and investigation, in order to advance understanding of the historic environment and the lives of human communities in the past.
- 3.1.2 Overarching research agendas for Wales set out key themes that archaeological investigation can inform. The series of publications is organised by chronological period from the Palaeolithic to the modern period, and provides a viable, realistic and effective academic basis for undertaking archaeological intervention. The research framework was commenced in 2001 and is currently under the third review<sup>1</sup>. It is presented by both area (Northwest Wales updated 2003) and theme (updated 2017).
- 3.1.3 Table 3.1 maps the archaeological remains anticipated to be present within the site against these identified research agendas.
- 3.1.4 Individual Site area specific WSIs will provide further detail and set out how the research potential of individual sites will be realised against the research agendas.

# 3.2 The Slate Landscape of Northwest Wales, UNESCO World Heritage Site

- 3.2.1 The Slate Landscape of Northwest Wales was added to the UNESCO World Heritage List in 2021. The Glyn Rhonwy Pumped Storage Generating Station is adjacent to The Slate Landscape of Northwest Wales Component Part 2: Dinorwig Slate Quarry Mountain Landscape, which is one of the six parts of the landscape. Research aims will therefore be linked as appropriate with the Outstanding Universal Value statement and criteria included above, as well as the Property Management Plan 2020-2030 (https://whc.unesco.org/en/list/1633/documents/).
- 3.2.2 The Slate Landscape of Northwest Wales has the following statement of Outstanding Universal Value (https://whc.unesco.org/en/list/1633/):

"The Slate Landscape of Northwest Wales is located in the United Kingdom, in the mountains of Snowdon massif. Six areas together represent an exceptional example of an industrial landscape which was profoundly shaped by quarrying and mining slate, and transporting it for national and international markets. From 1780 to 1940 this industry dominated world production of roofing slates, transforming both the environment and the communities who lived and worked here. The quarries and mines are monumental in scale, comprising stepped hillside workings, deep pits and cavernous underground chambers, massive cascading tips, ingenious water systems, and a range of industrial buildings. Outstanding technical equipment and major engineering features survive. Innovative transport systems linked quarries and processing sites with purpose-built coastal export harbours and with main-line railways. Grand country houses and estates built by leading industrialists contrast with workers' vernacular settlements, with their

<sup>&</sup>lt;sup>1</sup> https://archaeoleg.org.uk/index.html



characteristic chapels and churches, band-rooms, schools, libraries and meeting-places which retain multiple examples of their traditional way of life and strong minority language.

By the late 19th century, the region produced about a third of the world output of roofing slates and architectural slabs. Its use in terraced houses, factories, warehouses and elite architecture contributed to rapid global urbanization. It influenced building styles, encouraging the shallow-pitched roofs of the Georgian order. Technologies that were innovated, adopted and adapted in the property include the ingenious application of waterpower, the development of bulk handling systems and the first known application of the circular saw for cutting stone. These were diffused by specialists and by emigration of skilled Welsh quarrymen to the developing slate industries of the United States, continental Europe and Ireland. The Snowdon massif's narrow-gauge railway systems gained global influence and were adopted from Asia and America to Africa and Australasia."

3.2.3 The Slate Landscape of Northwest Wales was added to the UNESCO World Heritage List as a cultural landscape on the basis of criteria (ii) and (iv);

"Criterion (ii): The Slate Landscape of Northwest Wales exhibits an important interchange, particularly in the period from 1780 to 1940, on developments in architecture and technology. Slate has been quarried in the mountains of Northwest Wales since Roman times, but sustained large-scale production from the late 18th to the early 20th centuries dominated the global market as a roofing element. This led to major transcontinental developments in building and architecture. Technology, skilled workers and knowledge transfer from this cultural landscape was fundamental to the development of the slate industry of continental Europe and the United States. Moreover, its narrow-gauge railways - which remain in operation under steam today - served as the model for successive systems which contributed substantially to the social and economic development of regions in many other parts of the world.

Criterion (iv): The Slate Landscape of Northwest Wales is an outstanding example of a stone quarrying and mining landscape which illustrates the extent of transformation of an agricultural environment during the Industrial Revolution. Massive deposits of high-quality slate defined the principal geological resource of the challenging mountainous terrain of the Snowdon massif. Their dispersed locations represent concentrated nodes of exploitation and settlement, of sustainable power generated by prolific volumes of water that was harnessed in ingenious ways, and brought into being several innovative and technically advanced railways that made their way to new coastal ports built to serve this transcontinental export trade. The property comprises the most exceptional distinct landscapes that, together, illustrate the diverse heritage of a much wider landscape that was created during the era of British industrialisation."

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Table 3.1 Archaeological Research Agenda

Antici	pated Remains	Identified Features	Research Questions	Mapping to a Research Framework for the Archaeology of Wales Northwest Wales – by time- period, 22/12/2003	Mapping to a Research Framework for the Archaeology of Wales, 2017
÷	Features associated with the medieval rural landscape	Sheepfold: 156, 201 Sheep pen: 312 Sarn outbuilding: 271	1.a Do any of the surviving upland agricultural structures at the Site date from the medieval period?	1	Key research questions include: The wider environmental context of settlements in the agricultural landscape
					The nature of the functioning agricultural landscape (including transhumance)
					The development of agricultural techniques, crops and livestock
					Development of field systems and morphological relationship to tenure
Ċ	Features associated with post-medieval	Sheepfold: 156, 201 Sheep pen: 312 Sarn outbuilding: 271	2.a What is the nature and extent of the agricultural and industrial remains?	High priority - comprehensive survey • Rural settlement survey	Earlier Post Medieval 1539-1750.
	and modern agriculture		2.b What is the sequence of the agricultural use and industrial use?	High priority – scoping survey • Transport archaeology	I enurial changes and their effect on agricultural practice, rural settlement and rural communities.

Snowdonia Pumped Hydro	Mapping to a Research Framework for the Archaeology of Wales, 2017	Investigation of deserted rural settlements. Later Post Medieval & Industrial 1750 to 1900 The relationship between industry and agriculture, specifically in terms of the industrialisation of agriculture and improved transport links.	Earlier Post Medieval 1539-1750. Industry: Continuity with earlier and international context should be studied. Contextualisation of Wales's contribution to global industry, particularly coal and metal mining and metal and slate production.
	Mapping to a Research Framework for the Archaeology of Wales Northwest Wales – by time- period, 22/12/2003	Medium priority – scoping survey • Agricultural buildings and field systems • Twentieth century industry	
	Research Questions	2.c Does this sequence commence prior to the post- medieval period?	<ul> <li>2.a What is the nature and extent of the industrial termains?</li> <li>2.b What is the sequence of the industrial use?</li> <li>2.c Does this sequence commence prior to the postmedieval period?</li> <li>Wales Property Management Plan 2020-2030 p.177-9:</li> <li>2.d To what extent and in what ways do pre-industrial</li> </ul>
	Identified Features		Slate quarries and associated features: Chwarel Fawr, Chwarel Cefn Dû, Bryn Mawr Glynrhonwy.
0 WSP UK Limited	Anticipated Remains		<ol> <li>Features associated with earlier post medieval (1539- 1750) primary industries and transport</li> </ol>

				Snowdonia Pumped Hydro
emains	ldentried Features	Kesearch Questions	Mapping to a Research Framework for the Archaeology of Wales Northwest Wales – by time- period, 22/12/2003	mapping to a Kesearch Framework for the Archaeology of Wales, 2017
		settlement forms persist within The Slate Landscape of Northwest Wales?		
res iated with oost-	Slate quarries and associated features: Chwarel Fawr,	2.e What is the nature and extent of the industrial remains?	High priority – scoping survey • Transport archaeology	Later Post Medieval & Industrial 1750 to 1900 Assessment of
rn primary tries and oort.	Bryn Mawr Glynrhonwy.	2.f What is the sequence of the industrial use?	Medium priority – scoping survey • Twentieth century industry	The significance and scale of technical change within
		2.g Does this sequence commence prior to the later post-medieval period?		the major industries of coal, iron, copper, tin, lead and slate, and
		Extracted from The Slate Landscape of Northwest Wales Property		the impact of that change within the landscape; their context and significance in
		Management Plan 2020- 2030 p.177-9:		terms of similar sites elsewhere in the world; their relationship with the markets
		2.h What changes can be discerned in the health and		they served.
		welfare of the slate quarryman during the major industrial period?		The extent to which some industrial sites might have origins predating 1750.
		2.i How and in what ways did the slate industry make use		The varieties of planned and unplanned settlement; evidence

Snowdonia Pumped Hydro	Mapping to a Research Framework for the Archaeology of Wales, 2017	for migration and social diversity in housing stock Anglicisation, emerging	gentry culture and changes in economic practice.	The significance, form and archaeological survival of transport corridors	Government-sponsored roads, canals, railways – their engineering, the industries they served and the settlements they sustained.		
	Mapping to a Research Framework for the Archaeology of Wales Northwest Wales – by time- period, 22/12/2003						
	Research Questions	of natural resources including water and gravity to handle, process and transport slate?	2.j What was the extent of women's economic	involvement in the slate industry?		5.a What is the nature and extent of the military remains?	5.b What is the sequence of the military use?
	Identified Features					RAF Llanberis: 319	
19 © WSP UK Limited	Anticipated Remains					5. Features associated with modern military activity.	

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# 4. Development Impacts and Archaeological Response

#### 4.1 Introduction

- 4.1.1 Any works that disturb the ground, such as groundworks associated with construction of the Glyn Rhonwy Pumped Storage development site and associated developments, ecological mitigation measures etc. have potential to damage or destroy archaeological features, structures and deposits that may be present. Archaeology is a non-renewable resource. Where impacts cannot be avoided through exclusion from the project area or design modification, a programme of archaeological works (appropriate to the significance of the archaeological remains) is required to mitigate impact through thorough investigation and recording of the archaeology that will be damaged or destroyed.
- 4.1.2 The Environmental Statement (2015) has established that the land affected by Glyn Rhonwy Pumped Storage Generating Station has archaeological potential, indicated by data held on the County Historic Environment Record, and information from Historic Mapping and Aerial photography.
- 4.1.3 The initial phase of work will comprise a UAV (Drone) Survey. Following the completion of this survey, investigative techniques appropriate to different identified historic features will be confirmed.
- 4.1.4 The archaeological drone survey will provide an accurate and detailed survey of all remains within the site, allowing for intrusive mitigation and measure recording of at-risk features to be more effectively focused, and will allow a record of remains that cannot be surveyed safely through other means to be made.
- 4.1.5 These further investigative surveys may include:
  - UAV (Drone) Survey
  - Set Piece Excavation
  - Controlled/Monitored Strip Excavation
  - Archaeological Monitoring
- 4.1.6 The mitigation method used for each area of archaeological interest will reflect the archaeological potential identified during the drone survey and the level of impact as well as the practicability and safety of carrying out these works. These are provisionally set out at Table 4.1, and where the proposed investigation differs from that set out, agreement will be sought from the GAPS archaeologist. The type of investigation initiated may change if significant archaeological remains, not indicated at the survey stage, are identified during the mitigation works, e.g. Archaeological Monitoring may be upgraded to Set Piece Excavation, if particularly significant sites or features are identified. Conversely, the specific nature of features such as quarries and waste tips presents some very specific and significant safety considerations around access and stability. Archaeological works will be specified to minimise any risk and only be carried out where they can be implemented safely.
- 4.1.7 The detail of mitigation proposals, including the most appropriate methodology, and the exact extent of any intervention will be agreed with the Senior Planning Archaeologist for GAPS and archaeological advisor to Gwynedd Council, and will be set out within the contractor's method statements.





# Table 4.1 Impact and mitigation areas

Site Area and DCO work numbers	Works proposals	Non-designated historic assets	Mitigation	Research aims category
Quarry 1, Chwarel Fawr. Work 1, Upper reservoir and dam.				
4	Dam, reservoir, tower, spillway	Chwarel Fawr Quarry and associated features: Slate quarry: 142, 281 Trackway: 161 Possible structural remains under spoil tip: Possible structural remains under spoil tip: 324 Quarries or trial pits: 325 Building remains: 317 Possible building remains/stacked slates: 249 Small structure on raised ledge: 250 Tunnel in quarry: 248 Iron loop: 246 Building remains: 318 Low walls: 43, Trial mines l&II: 167, 168 Labourers shelter: 147, 150	Drone survey of all features, including inaccessible features within quarry base.	ά, 4
		Tramway IV: 165 Tramway tunnel portal: 166	Targeted monitored Strip	3, 4
		Low walls: 323 Quarry buildings: 155	Targeted Set Piece Excavation	3, 4

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Site Area and DCO work numbers	Works proposals	Non-designated historic assets	Mitigation	Research aims category
ũ	New slate mounds and reprofiling of mounds	Chwarel Fawr Quarry and associated features: Wall IV or revetment: 173 Tramway III: 164 Sarn farm outbuildings: 271 Quarry building I & II: 151, 152 Wall III or revetment: 172 Shelters: 277 Wall II: 171 Slate quarry II: 167 Slate quarry II: 163 Tramways I &II: 162, 163 Iramways I &II: 162, 163 Labourers shelter I, II & III: 144, 145, 146 Spoil heap, spoil heap I & II: 143, 158, 159 Spoil heap, spoil heap I & II: 143, 158, 159 Spoil heap complex: 283, Small structure on slate tip: 270, Sheepfold: 201	Drone survey of all features, including inaccessible features and unstable spoil heaps	ი, 6, 4
Ų	Rights of way	Sheepfold: 156 Slate Quarry I, Bryn-Mawr: 15, Chwarel Cefn Du trial mine III: 137 Chwarel Cefn Du slate quarry II: 136 Stile at Chwarel Cefn Du: 132 Stile at Chwarel Cefn Du: 132 Chwarel Fawr Quarry and associated features: Labourers Shelter V: 148, Small structure on slate tip: 270, Spoil heap II: 159,	Drone survey of all features, including inaccessible features and unstable spoil heaps	2, 9, 4

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23 © WSP UK Limited			Snow Pumj	rdonia ped Hydro
Site Area and DCO work numbers	Works proposals	Non-designated historic assets	Mitigation	Research aims category
		Bryn-Mawr slate quarry building VI: 35,		
		Tramway IV: 165	Targeted monitored Strip	3, 4
		Bryn-Mawr slate quarry building IV: 34 Bryn-Mawr slate quarry buildings: 36 Bryn-Mawr Tramway: 39	Targeted Set Piece Excavation	3, 4
		Chwarel Fawr Quarry buildings: 155		
Ģ	Temporary construction compounds	Sheepfold: 156 Chwarel Fawr Quarry and associated features: Tramway I, II & III: 162, 163, 164 Small structure on slate tip: 271 Quarry building I & II: 151, 152 Wall III or revetment: 172 Shelters: 277 Wall III or revetment: 172 Shelters: 277 Wall III or revetment: 172 Shelters: 277 Wall III: 171, Slate quarry II: 157 Labourers shelter I, II & III: 144, 145, 146 Tramway I: 162 Spoil heap: 143 Spoil heap 1 & II: 158, 159 Spoil heap 20, Small structure on slate tip: 270,	Drone survey of all features, including inaccessible features and unstable spoil heaps	2, , 4
		Bryn-Mawr slate quarry buildings: 36	Targeted Set Piece Excavation	3, 4
Ĥ	Temporary car park	No assets		
1F	Car park	No assets		

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Site Area and DCO work numbers	Works proposals	Non-designated historic assets	Mitigation	Research aims category
16	Reprofiling of slate mounds,	Chwarel Cefn Du slate quarry II & trial mine II: 131,136	Drone survey of all features, including inaccessible features and	3, 4
	2 2 2 0 0	Chwarel Fawr Quarry and associated features: Quarries or trial pits: 325, Spoil heaps: 160 Labourers shelter: 148 Spoil heap I: 158 Trial mine III: 169		
		Bryn-Mawr slate quarry:		
		Labourers shelter X: 31		
		Wall I: 37		
		Chwarel Cefn Du trial mine III: 137 Stile at Chwarel Cefn Du: 132		
		Bryn-Mawr Quarry building I: 32		
		Tramway IV: 165	Targeted Monitored Strip	3, 4
		Bryn-Mawr Quarry buildings: 36	Targeted Set Piece Excavation	3, 4
1H	Open space	No assets	1	
2	Underground penstock 1A-3A	Numerous. No impacts		
e	Above ground powerhouse	RAF Llanberis: 319	Drone survey of all features. Low potential due to modern landscaping	5

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Site Area and DCO work numbers	Works proposals	Non-designated historic assets	Mitigation	Research aims category
	Underground turbine hall			
Quarry 6, Glyn Rhonwy. Work 4, Lower reservoir and dam.				
4A	Dam, reservoir, drainage, reprofiling of slate mounds, landscaping	Find spot Bronze Age palstave: 226 Glyn Rhonwy Quarry (Lower): Two structures possibly linked to aerial ropeway/winding engine: 320, Possible structural remains under spoil heap: 322, Q6: 329	Not applicable Drone survey of all features, including inaccessible features and unstable spoil heaps	- č. 4
4B	Temporary construction compound	No assets	1	
4C	Reprofiling of spoil and wall	Glyn Rhonwy Quarry (Lower): Smithy building: 306, Two structures possibly linked to aerial ropeway/winding engine:320, Line of industrial buildings: 321, Possible structural remains under spoil heap: 322	Drone survey of all features, including inaccessible features and unstable spoil heaps	, б 4
		Roman road: 259 Sheep pen on old mapping: 312	Targeted Archaeological Monitoring	1, 2
4D	Configure/improve private road	No assets		

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Site Area and DCO work numbers	Works proposals	Non-designated historic assets	Mitigation	Research aims category
4E	Spillway to Lake Padarn	Railway over reclaimed land: 304, Buildings by railway: 305	Targeted Archaeological Monitoring	4
4F	Underground pumping station and above ground control box	Railway over reclaimed land: 304	Targeted Archaeological Monitoring	4

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# 5. Archaeological Response

#### 5.1 General Principles

- 5.1.1 Archaeological work is intended to:
  - mitigate loss of archaeological interest of at-risk historic assets; and
  - inform planning of non-archaeological (i.e. avoidance and design) mitigation.
- 5.1.2 All archaeological mitigation will be proportionate to the significance and extent of the potential effects on archaeological remains, and will be designed to address the specific research agenda set out at section 3.
- 5.1.3 The following professional standards apply:
  - Chartered Institute for Archaeologists 2014 (revised 2021). Code of Conduct: Professional Ethics in Archaeology;
  - Chartered Institute for Archaeologists 2014 (revised 2020). Standard and guidance for historic environment desk-based assessment;
  - Chartered Institute for Archaeologists 2014. Standard and guidance for archaeological excavation;
  - Chartered Institute for Archaeologists 2014 (revised 2020). Standard and guidance for an archaeological watching brief;
  - Chartered Institute for Archaeologists 2014. Guidelines for the Collection, Documentation, Conservation and Research of Archaeological Materials;
  - Cadw 2017. Setting of Historic Assets in Wales.
  - The Welsh Archaeological Trusts 2018. Guidance for the Submission of Data to the Welsh Historic Environment Records.
  - The National Panel for Archaeological Archives in Wales 2017. The National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales.
  - The Royal Commission for the Ancient and Historical Monuments of Wales 2015. RCAHMW Guidelines for Digital Archives.

#### 5.2 **Proposed methodology and application**

#### **Drone Survey**

- 5.2.1 Due to the extent and highly varied topography across the site, it is proposed to create a detailed digital surface model (DSM), orthophoto and 3D depiction of the area using drone-based photogrammetry. This will be achieved by a series of pre-planned automated survey flights using a small, unmanned air vehicle (SUAV) collecting structured vertical digital images with a 60% overlap, flown on two axes.
- 5.2.2 The ground resolution will be c.2cm per pixel based on a 20mp sensor at an altitude of 60m. Ground control points will be surveyed in using a GNSS base and rover, to calibrate the final imagery.



- 5.2.3 This data will be processed and imported into GIS to provide a detailed model of the site. This will also be used for defining more traditional ground-based survey techniques, particularly in areas which are not accessible to drone surveys (e.g. woodland).
- 5.2.4 All areas where intrusive works are planned or where archaeological remains may be disturbed will be surveyed, except where these are inaccessible due to vegetation or woodland cover.

#### Archaeological monitoring (watching brief)

- 5.2.5 Archaeological monitoring (watching brief) will be used to:
  - provide opportunities for archaeological investigation, and recording in circumstances where investigation would otherwise be impracticable;
  - where archaeological remains of limited value or extent are suspected within a working area; and
  - it will comprise an archaeologist being present, either continuously or on an agreed schedule of inspection-based visits, during intrusive groundworks so that the presence, or absence, of archaeological remains could be confirmed, and any such remains be appropriately recorded.
- 5.2.6 The risk that archaeological remains might be present will be well- established on the basis of previous stages of drone survey, and/or mitigation works, and the areas identified within the individual site WSIs. Any site- specific requirements will be set out within the individual site WSIs.
- 5.2.7 The need to monitor construction works will be predictable, and appropriate arrangements for GAPS inspection visits will be acceptable in most instances.
- 5.2.8 Where archaeological deposits are encountered, sufficient excavation will take place to allow appropriate records to be compiled, as might be reasonably achieved. Provision will be allowed for access in keeping with health and safety considerations.
- 5.2.9 Should extensive and/or important/well preserved remains be found, which cannot be addressed within the scope of a watching brief, the requirements for any further excavation will be discussed with the client and the GAPS archaeologist.
- 5.2.10 Archaeological monitoring and recording will be carried out to the standards set out at sections 5.3 and 5.6.

#### **Controlled/Monitored Strip**

- 5.2.11 Controlled/Monitored Strip mitigation will be undertaken to identify specific archaeological foci within an extensive area of potential, or to expose the spatial characteristics of extensive archaeological landscape elements, such as field systems, prior to selecting locations for targeted sample excavation. This work is to be undertaken within a framework of evidence- based research objectives.
- 5.2.12 Following initial machine overburden strip (which will be directed and monitored by the archaeological contractor), the area should be examined, and a plan of identified and potential archaeological features and deposits prepared at an appropriate scale. This will inform proposals for sample excavation, to be agreed with the GAPS archaeologist.
- 5.2.13 Where necessary to allow construction works to continue, the release of a part of an area may be agreed with the GAPS archaeologist once an appropriate agreed level of



investigation has been completed. In this situation, areas which have not been released will be clearly demarcated.

- 5.2.14 Key stages in Controlled/Monitored Strip are:
  - careful overburden strip of topsoil and subsoil, using a back-acting excavator, to the archaeological horizon;
  - immediate planning (mapping) of the area while the uncovered surface is fresh. The area should be subsequently checked to see if weathering reveals further features and the plan updated as appropriate; and
  - sampling, concentrating on establishing a relative chronology through the investigation of feature intersections, and by attempting to establish a more precise chronology.
- 5.2.15 Areas for strip, map, and sample will be identified following drone survey, and will be agreed with GAPS. Individual areas and the justification for their selection will be set out within the individual site WSIs.
- 5.2.16 Following the planning stage, an appropriate sample of identified features will be investigated. Key areas and nodes will be investigated in sufficient detail to understand them both in respect of themselves and also in relation to their surroundings. This work will be focused on adding to the spatial, chronological, functional and environmental context of the investigated area drawing on the standards set out in section 5.3, and in accordance with the GAPS. Any site-specific variations will be set out within the individual site WSIs, and/or agreed with the GAPS archaeologist.
- 5.2.17 This requirement to sample and record identified features will be continually monitored during the course of fieldwork and amended according to its effectiveness in meeting research objectives. In particular, consideration of strip, map, and sample operations will be discussed with the GAPS archaeologist, with a view to extending these operations where significant archaeological remains have been observed, or scaling back operations where the potential presence of archaeological features is demonstrably low, based on:
  - identified prior truncation/disturbance;
  - absence of observed features; or
  - confirmation of prior survey results which suggest poor survival of archaeological features.
- 5.2.18 Any decision to scale back the scope of strip, map, and sample mitigation will only be undertaken after agreement of the GAPS archaeologist has been confirmed.
- 5.2.19 Following completion of archaeological investigation to the satisfaction of the GAPS archaeologist, the relevant area, or agreed parts thereof, will be released to the main contractor so that construction works may proceed.

#### **Set-piece excavation**

- 5.2.20 Set-piece excavation will be undertaken where drone survey has identified the extent, and character of significant archaeological remains, allowing for a definitive investigation area, sampling and finds recovery policy to be defined.
- 5.2.21 The individual defined areas identified for set-piece excavation will be set out in the relevant individual site WSI. This will include provision to extend areas if important archaeology continues beyond the defined extent.



5.2.22 Set-piece excavation and recording will be undertaken to the standards set out at section 5.3, and in accordance with the GAPS. Any site-specific sampling requirements will be set out within the individual site WSIs.

#### 5.3 Standards for archaeological work

- 5.3.1 The standards set out below draw upon, and should be used in conjunction with, the GAPS fieldwork requirement documents, and the national and regional excavation standards.
- 5.3.2 A unique site code will be assigned as agreed with GAPS. All parts of Site Archive, including finds, samples, plans, photographs, and excavation paperwork will be marked with this number. It will be printed on the cover of all reports and used as the accession number for deposition of the archive.

#### Machine overburden strip

- 5.3.3 For all areas identified as requiring intrusive archaeological work in the individual site WSIs, removal of topsoil, overburden, to the first significant archaeological horizon will be undertaken by a back-acting excavator fitted with a wide (1.8m) toothless ditching bucket, under the continuous supervision of the archaeology contractor with the authority to halt and direct machine excavation.
- 5.3.4 Spoil will be temporarily stockpiled on-site at an identified location, at a safe distance from the stripped areas, and other constraints, to the satisfaction of the main contractor. Topsoil, subsoil, and archaeological deposits should be kept separate during excavation, to allow for sequential backfilling of excavation. Topsoil should be examined for archaeological material.
- 5.3.5 Areas stripped for, or under, archaeological investigation must be clearly marked and identified to construction contractors, so that the area is not tracked over, or otherwise disturbed, until the area is clear of archaeological remains, the supervising site archaeologist will confirm to the contractors when an area has been released from archaeological control, and vehicles can track over the specified area.
- 5.3.6 The first significant archaeological horizon, and all subsequent archaeological deposits will be cleaned by hand. Excavation of any archaeological deposits identified will proceed by hand, to the standards set out below, unless specifically agreed with the GAPS archaeologist, or to any site-specific requirements set out in the individual site WSIs. If colluvial or alluvial deposits are identified sealing earlier archaeological horizons, the potential for machine stripping of these deposits will be discussed with the GAPS archaeologist, once any archaeological features cutting them have been fully excavated and recorded, and it has been established that these deposits are otherwise archaeologically sterile.
- 5.3.7 Following completion of archaeological investigation to the satisfaction of the GAPS archaeologist, and the main contractor, each trench, or excavation area, will be backfilled with the spoil and compacted by machine to level fill, unless otherwise instructed by the main contractor.

#### Hand excavation

5.3.8 There is the presumption that excavation of all archaeological deposits will be done by hand unless it can be shown there will not be a loss of evidence by using a machine.



5.3.9 Archaeological features will be hand cleaned prior to excavation, to provide accurate definitions. For linear features, such hand cleaning will be targeted at sample excavation points. Deposits interpreted as natural subsoil should be tested by hand, or machine excavation to determine the validity of this interpretation. Where features are interpreted as natural (e.g. tree throws), a percentage of these features, agreed with GAPS archaeologist, will be hand excavated to establish the accuracy of the interpretation.

#### Excavation

- 5.3.10 Features will be excavated according the following sampling strategy:
  - Features which are, or could be, interpreted as structural must be fully excavated.
  - Post holes and pits must be examined in section. Full excavation may be appropriate for specific problem-solving, complex depositional sequences and finds recovery. Full excavation may also be appropriate if pits or postholes are small.
  - Fabricated surfaces (e.g. yards and floors) must be fully exposed and cleaned, and representative sections excavated, to determine their construction and whether they seal earlier deposits. Where earlier features are suspected of underlying surfaces, the surface will be hand-lifted once it has been fully recorded. The collection of spatially distinct samples will be considered in order to investigate the use/function of an area and if different activity zones can be identified.
  - All burial deposits and associated remains will be subject to 100% excavation and recorded in accordance with an agreed methodology. Spatially distinct samples from the head, torso and feet will be taken in accordance with guidance.
  - Other features must be sufficiently examined to establish, where possible, their date function. In general 50% of the representative non-structural linear cut features; 10% of the fills of substantial linear features (e.g. ditches) in order to establish the feature's character, date and morphology and to provide information on activities taking place in close proximity to the feature. These samples may be varied with the agreement of GAPS to reflect specific site conditions observed during excavation.
  - Any stratified layers should be subject to hand excavation in 2.5m or 1.0m systematic, and gridded squares on the basis of the complexity and extent of the layers. The details of which will be agreed with GAPS and set out within site-specific WSIs where required.
  - Where complex sequences are observed during the excavation, an amended excavation strategy will be agreed with GAPS.
- 5.3.11 The sampling excavation strategy will be reviewed continuously throughout the course of fieldwork and, if necessary, amended in order to take account of changing circumstances and understanding. Any changes or amendments will be agreed in advance of implementation with the GAPS archaeologist and confirmed in writing. For any complex remains, a sampling strategy will be discussed and agreed with GAPS.
- 5.3.12 Where insufficient dating material or information has been retrieved from a partially sectioned feature, further sampling may be undertaken, subject to consideration of residuality, or other factors that might limit the integrity of archaeological data, with reference to the research objectives, and in consultation and agreement with the GAPS archaeologist. This may include bulk or column sampling for scientific dating, and/or environmental analysis (e.g. grain or faunal species) which may provide broad dates.





- 5.3.13 Guidelines for developing site-specific sampling strategies will be set out in the individual site area WSIs. The sampling strategy will be kept under review during the excavation work, and will consider the following:
  - a robust spatial framework of excavation to provide an understanding of the distribution of past activities across the investigation area, including any 'special' deposits and any patterning in artefact distribution. Such a framework will consider the inter-relationship of major features;
  - the investigation of the intersections of features of archaeological date to obtain a phasing of the site; and
  - structural remains and other areas of significant and specific activity (domestic, industrial, religious, hearths, 'special'/ patterned deposits etc.) will be excavated, and recorded to a degree whereby their extent, date form, function and relationship to other features and deposits can be established.
- 5.3.14 Metal detector searches must take place during excavation, including the scanning of areas before they are stripped. Detecting must be undertaken by named, experienced metal detector users, with the site specific WSI including reference to their relevant experience. Detecting equipment should be high specification.

#### Survey

- 5.3.15 Surveying will be done using a survey-grade GPS (e.g. Leica CS20/GS08 or Leica 1200).
- 5.3.16 The site grid will be accurately tied into the OS National Grid, and located on the 1:2500 or 1:1250 map of the area. Elevations will be levelled to the Ordnance Datum.

#### Recording

- 5.3.17 A full and proper record (written, graphic and photographic, as appropriate) will be made for all work in line with the standards set out in the GAPS fieldwork requirement documents, and the national and regional excavation standards.
- 5.3.18 A register of all trenches, features, photographs, survey levels, small finds and human remains will be kept.
- 5.3.19 Unique context numbers will be issued for all features, layers and deposits. Each will be individually documented on a context sheet and drawn in section and plan.
  - Plans of any archaeological features on-site are to be drawn at 1:20, or 1:50 depending on the complexity of the feature being recorded.
  - Sections should be drawn at 1:10, or 1:20 depending on the complexity of the feature being recorded.
  - All levels should relate to Ordnance Datum.
  - A photographic record of the work will consist of digital images (minimum file size of 6 megapixel) taken on a high-resolution digital camera.
  - Photographs will include general site shots and photographs of specific features. Photographs will include a scale, north arrow, site code and feature number (where relevant), and will be listed on the photograph register.



#### **Environmental sampling**

- 5.3.20 The on-site sampling policy will be inclusive, as the significance of individual features may not be fully understood, until wider patterns of spatial distribution and phasing are understood. As set out in the general methods above, arrangements for the processing of bulk samples taken for the recovery of environmental materials should be confirmed. The minimum bulk sample size will normally be 40 litres or 100% of the deposit if the deposit does not amount to 40I, though the final sampling and discard policy for individual sites will be agreed in consultation with the Glyn Rhonwy Pumped Storage Generating Station environmental specialist, the GAPS archaeologist, and the Regional Scientific Advisor, and set out within the site-specific WSI. Processing of samples should be undertaken while excavations are being undertaken in order that information can be fed back and inform the ongoing strategy.
- 5.3.21 Archaeological deposits will be sampled systematically in bulk samples. All samples will be collected from the fills of cut features, and from any other securely stratified deposits that have the potential to provide environmental or economic information, such as occupation layers or material accumulating on use surfaces. Particular emphasis will be placed on contexts that may supply material suitable for scientific dating of potential early medieval and prehistoric features. Decisions on sampling must also take account of stratigraphic factors, and consider the opportunity to employ chronological, and spatial controls, in the recovery of samples in order to generate environmental information of sufficient quality to meet the research objectives.
- 5.3.22 Provision will be made for column and other appropriate samples to be taken for geoarchaeological assessment, and analysis as appropriate and in line with technical guidance including Historic England guidance. Due consideration will be given to the collection of samples suitable for microfossil analysis, and other specialised analysis from suitable deposit sequences, that might inform the pattern of changing environmental conditions over time. Waterlogged and cess deposits will be specifically sampled for microfaunal and invertebrate analysis. Bulk samples will also be taken from any waterlogged deposits present for assessment of organic remains. Any organic artefacts that are retrieved during the excavation will be stored in appropriate conditions, and assessed by a qualified archaeological conservator.
- 5.3.23 Industrial residues and waste from craft, and manufacturing processes will also be routinely sampled in line with guidance provided by Historic England.
- 5.3.24 If required, a detailed site-specific sampling policy in line with the GAPS regional, and national guidance will be set out in the individual site-specific WSI. This will detail specific categories of material that are of interest for the individual sites, and identify a programme of work to support the research objectives. Revised as appropriate throughout the excavation and post-excavation phases.

#### Artefact recovery and conservation

- 5.3.25 The recovery of material that can adequately date major archaeological phases is a key requirement. It is recognised that the incidence of artefacts may limit the quality of datable assemblages, and measures for scientific dating are also set out below. However, artefacts remain a key source of dating information.
- 5.3.26 All finds will be collected and processed, unless variations are agreed with the GAPS archaeologist during the course of excavation.
- 5.3.27 Ceramic finds should be processed, and initial assessment undertaken for dating and significance, concurrently with the excavation, to allow immediate assessment and input into decision-making.



- 5.3.28 Bulk finds such as pottery and animal bone will normally be collected by context. Where it is appropriate and following additional instruction, enhanced recovery techniques and sampling strategies for the recovery, and recording of waterlogged wood and timber, will be set out in respect of specific sites in the individual site WSIs as appropriate.
- 5.3.29 Finds will be temporarily stored on-site and removed from site to a secure location as required. Waterlogged organic finds, such as wood and leather, should be removed from site on the day that they are excavated and transferred to a suitable location with facilities to maintain them without degradation of the material.
- 5.3.30 Finds and samples will be exposed, lifted, cleaned (with the exception of organic remains), conserved, marked, bagged, boxed and stored in line with the standards in:
  - Watkinson & Neal (1988) First Aid for Finds;
  - Chartered Institute for archaeologists (2014) Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials;
  - English Heritage (1995) A Strategy for the Care and Investigation of Finds;
  - Historic England (2017) Organic Residue Analysis and Archaeology:
  - Guidance for Good Practice; and
  - The requirements of the recipient museum (the receiving museum will be identified in the relevant site-specific WSI).
- 5.3.31 A discard policy acceptable to the GAPS Archive will only be implemented following quantification, assessment, and recommendation from artefactual and environmental specialists. Certain classes of material, such as post-medieval pottery and building material, may be discarded after recording if a representative sample is kept, but no finds will be discarded without the prior approval of the GAPS archaeologist and the GAPS Archive.
- 5.3.32 Where finds require conservation, this will be done in accordance with the guidelines of the Institute for Conservation.

#### **Scientific dating**

- 5.3.33 Achieving coherent intra and inter-site chronologies across all phases of activity is a key objective, as this may help resolve problems in the identification of cultural activity during period when ceramics were not generally available to communities, or where features do not contain readily datable artefacts. A strategy for the selection of samples for scientific dating will be set out for each site in the relevant site-specific WSI, taking into consideration statistical procedures designed to enhance the accuracy of site chronologies.
- 5.3.34 Samples of material suitable for scientific dating techniques including AMS C14 dating, archaeomagnetism (for example, charred seeds or in situ burnt clay from appropriate contexts), or thermoluminescence will be collected where available in accordance with individual site WSIs. Where a specialist may be required to visit the site and collect samples this will be identified at the earliest opportunity.
- 5.3.35 Scientific dating will be a significant consideration during the post- excavation assessment and will inform the updated project design provided in section 5.6. The assessment of the chronology within a Bayesian framework should be considered if significant remains or sequences are identified.



5.3.36 Scientific dating, undertaken concurrent with the excavation fieldwork, may be required to inform levels of sampling of certain features or structures, such as wooden trackways. If there is the potential for significant waterlogged wooden remains to be found, a wood specialist may be required on site to records and sample remains, and dendrochronology specialists be used to support the dating of remains where necessary.

#### 5.4 **Procedures in respect of statutorily designated remains**

#### **Human remains**

- 5.4.1 In the event of archaeological human remains being encountered they will be left in situ, covered and protected and the Coroner, and the GAPS archaeologist will be informed. During the mitigation phase of works, it is expected that all human remains will be fully excavated, and that this will be done at the earliest opportunity following their discovery.
- 5.4.2 The Archaeological Contractor will liaise with the developer to ensure that the process set out in Section 28 of the DCO is followed, to enable the legal removal of any human remains encountered in the works. The Archaeological Contractor is to comply with the any conditions agreed under this process.
- 5.4.3 If removal is agreed, all subsequent work will comply with relevant regulations (including local authority environmental health regulations) and technical guidance.
- 5.4.4 The Archaeological Contractor will have available within the team, or on call, an appropriately qualified and experienced osteo-archaeologist, to supervise the excavation and removal of human remains from the site. The Archaeological Contractor will use an appropriately qualified and experienced archaeological conservator to assist where appropriate in the lifting of human remains, and grave goods/cremation vessels.

#### **Protected military remains**

- 5.4.5 The Protection of Military Remains Act 1986 applies to any aircraft which have crashed while in military service, and to certain wrecks of vessels which were wrecked while in military service. Protection of Military Remains Act 1986 makes it an offence to disturb, move, or unearth military remains which have been designated.
- 5.4.6 There are no designated protected areas or controlled sites within the site boundary, and there are no records of military vessels or aircraft having been lost within the site boundary.
- 5.4.7 Where remains are observed during archaeological investigation or construction work, intrusive work should cease, and the site be secured while consultation with the Ministry of Defence is undertaken.

#### Treasure

5.4.8 Any items which are recovered which could be deemed as treasure will be subject to the provisions of the Treasure Act 1996, and the Treasure (Designation) Order 2002. Such material shall normally be removed from site to a secure location at the end of the working day on which it is found. In addition to the statutory authorities, the relevant Portable Antiquities Officer should be informed.

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#### 5.5 Finds Processing

- 5.5.1 All finds processing, conservation work and storage of finds must be carried out in compliance with the Chartered Institute for Archaeologists Guidelines for the collection, documentation, conservation and research of archaeological materials. Finds should not be left unprocessed on site during the completion of the fieldwork.
- 5.5.2 The deposition and disposal of artefacts must be agreed with the legal owner and the GAPS Archive prior to the work taking place.
- 5.5.3 All retained artefacts must be cleaned and packaged in accordance with the requirements of the recipient museum.

#### 5.6 Post-excavation work, reporting and dissemination

#### Site Archive

- 5.6.1 Before the commencement of fieldwork, contact should be made with the landowners and Gwynedd Archaeological Trust Archive to make the relevant arrangements. Details of land ownership should be provided by the developer.
- 5.6.2 The archaeological contractor will specify the GAPS Archive, and confirm that arrangements for receipt of archaeological material, and site archives, have been agreed before the commencement of fieldwork.
- 5.6.3 The archive and the finds must be deposited in the GAT Archive within six months of completion of the post-excavation work and report.
- 5.6.4 The GAPS archaeologist will require confirmation that the archive has been submitted in a satisfactory form.
- 5.6.5 A digital copy of the reports will be supplied to the GAT Historic Environment Record (HER) on the understanding that it will become a public document after an appropriate period of time (generally not exceeding six months).
- 5.6.6 A project archive will be prepared in accordance with the National Monuments Record (Wales) agreed structure and be deposited with the National Monuments Record, RCAHMW, on completion of the site analysis and report production.

#### Reporting

5.6.7 Reports will be produced for all archaeological survey and fieldwork undertaken. The type of report produced will reflect the nature of the investigations, as detailed below. Reports must also be produced for all archaeological investigations undertaken.

#### **Drone Survey**

- 5.6.8 The reporting of the Drone Survey will comprise a 3D model of the survey areas noting any archaeological features, areas of disturbance, or findspots observed during the survey.
- 5.6.9 This model will be supported by summary text describing each observation noted on the survey model, and setting out any additional evidence that has supported interpretation of these observations, before setting out a summary of the anticipated presence of archaeological remains within the survey area, and recommendations for further archaeological works.



- 5.6.10 Appropriate supporting evidence would typically include but is not limited to Light Detection and Ranging digital terrain models, results of documentary research, conventional aerial photography and historic mapping.
- 5.6.11 Any further archaeological works would be carried out under the standards set out within this overarching WSI.

#### **Post-excavation assessment**

#### Purpose

- 5.6.12 The intention of carrying out a Post Excavation Assessment is to provide a summary of the results of the fieldwork and material recovered during the excavation, to consider its potential to address archaeological questions, and to allow costed recommendations to be made for further investigation of artefacts and environmental material recovered during excavation and the final reporting, which will be carried out following the completion of all of the archaeological fieldwork.
- 5.6.13 The Post Excavation Assessment is intended to be a summary document rather than a detailed record. However, the level of reporting will provide sufficient detail to allow recommendations to be made, fully costed, and justified.
- 5.6.14 Where works are carried out by multiple archaeological contractors, arrangements for coordination of separate Post Excavation Assessments, or production of a single collated Post Excavation Assessment must be agreed with the GAPS archaeologist in advance of fieldwork commencing.
- 5.6.15 Excavation plans for each Site will be supplied to GAPS in a georeferenced GIS compatible format, e.g. shapefiles.
- 5.6.16 Drafts of the PXA will be provided for review by GAPS, followed by a single hard mastercopy, and a digital version of the final report, which will be submitted after the receipt of comments on the draft reports.

#### Form

- 5.6.17 The Post Excavation Assessment will comprise:
  - introduction:
    - o scope of the Glyn Rhonwy Pumped Storage Generating Station;
    - $\circ$  circumstances and dates of fieldwork and previous work; and
    - o comments on the organisation of the report.
  - original research aims;
  - summary of the documented history of the site(s);
    - o interim statement on the results of fieldwork;
    - $\circ$  summary of the site archive and work carried out for assessment:
    - o site records: quantity, work done on records during post- excavation assessment;
    - finds: factual summary of material and records, quantity, range, variety, preservation, work done during post-excavation assessment. All artefacts must be fully quantified by context, material type and date, and presented in a tabular format;



- environmental material (recovered by hand): factual summary of quantity, range, variety, preservation, work done on the material during the Post Excavation Assessment , including quantification by context and material type in tabular format, of human and animal bone, shell, wood etc.
- environmental material (recovered through sampling): factual summary of quantity, range, variety, preservation, work done on the material during the Post Excavation Assessment, including quantification by context, sample number, and type of sample (e.g. bulk, dendrochronological, monolith) in tabular format. The percentage of each sample that has been a) processed and b) analysed must be described; and
- documentary records: list of relevant sources discovered, quantity, variety, intensity of study of sources during post- excavation assessment.
- potential of the Data:
  - an appraisal of the extent to which the site archive might enable the data to meet the research aims of the Glyn Rhonwy Pumped Storage Generating Station project, sub-divided according to the research aims of the Glyn Rhonwy Pumped Storage Generating Station rather than the form of the data;
  - a statement of the potential of the data in developing new research aims, to contribute to other projects and to advance methodologies; and
  - o summary statement of the significance of the data.
- additional information will normally include:
  - o supporting illustrations at appropriate scales;
  - sufficient supporting data, tabulated or in appendices, and/or details of the contents of the Glyn Rhonwy Pumped Storage Generating Station archive, to permit the interrogation of the stated conclusions; and
  - o index, references and disclaimers.

#### **Updated Project Design (UPD)**

#### Purpose

- 5.6.18 An Updated Project Design for the whole Glyn Rhonwy Pumped Storage archaeological project will be prepared on completion of the Post-Excavation Assessments, providing a scope and programme for the analysis, reporting, publication and dissemination of the findings. It will bring together the results of all stages of the archaeological project, and provide a framework for further investigation of the material recovered and results.
- 5.6.19 A draft of the UPD will be provided for review by GAPS, followed by a single hard mastercopy, and a digital version of the final report, which will be submitted after the receipt of comments on the draft report.

Form

- 5.6.20 The UPD will include:
- 5.6.21 Proposals for the further recording, analysis or other work required on the stratigraphic data, artefacts and ecofacts;



- Sufficient supporting data, tabulated or in appendices, and/or details of the contents of the Glyn Rhonwy Pumped Storage Generating Station archive, to permit the interrogation of the stated conclusions; and
- Proposed discard strategy;
- Proposals for scientific dating (potentially an initial suite of dates and a second after provisional results from the artefact and ecofact analysis are received);
- Proposals for a Bayesian analysis to refine chronologies, with regard to the selection of contexts and samples for scientific dating.
- Proposals for comparative analysis of the drone survey and excavation results;
- Proposals for further research;
- Proposals for final reporting and publication, including format/medium and a synopsis of the content;
- Proposals for any further work required on the project archive, such as consolidation or conservation;
- Task lists, programme, costings and timescale for the proposed further work, to include publication (both academic and popular) and archive deposition;
- Details of the proposed project team;
- Proposals for continuing liaison and communication with GAPS during the remaining post-excavation process.

#### **Publication**

- 5.6.22 Formal publication of the results of some or all of the fieldwork is likely to be required. The results of the works will be reviewed and decisions taken on the scope and level of any publication(s) following the submission of the Post Excavation Assessment reports and review. This will consider the most appropriate route for dissemination, and the scope of any dissemination, including consideration of whether thematically or chronologically related sites should be reported together. Details of publication will be addressed in the UPD.
- 5.6.23 Provision will be made for full grey literature research archive reports for all sites that do not proceed to publication.
- 5.6.24 Provision will also be made to contribute to the annual summaries in Archaeologia Cambrensis.

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# 6. Health, Safety, Security & Environment

- 6.1.1 Health and Safety will take priority over all other requirements. A conditional aspect of all archaeological work is both safe access to the area of work, and a safe working environment. All relevant health and safety legislation, regulations, and codes of practice should be respected and adhered to. Site-specific risk assessments will be carried out in respect of each element of the mitigation fieldwork prior to commencement of the fieldwork, and copies sent to the representatives of the client for approval.
- 6.1.2 Where conflict between Health and Safety and progressing the archaeological project is identified, every effort will be made by the client, in discussion with the archaeological contractors and GAPS, to identify a safe way of completing the archaeological investigations to appropriate standards.
- 6.1.3 The Glyn Rhonwy Pumped Storage Generating Station project will be carried out in accordance with safe working practices and under the defined Health, Safety and Environmental Policy.
- 6.1.4 Copies of the successful contractor's insurance policies will be required in advance by the client or their nominated representative.
- 6.1.5 The appointed contractor/s will take responsibility for securing the excavation areas (e.g. by fencing), provision of welfare, backfilling and reinstatement of the excavation areas and the removal of materials brought onto the site during the excavation.
- 6.1.6 Service plans will be supplied by the appointed principal contractor. Any archaeological intervention must respect all requirements for safe stand-off distances and working practices in regard of these features.
- 6.1.7 Any specific site security requirements will be set out within the individual site WSIs, and these will be discussed and agreed with the client and main works contractors.



# 7. Monitoring

- 7.1.1 The GAPS archaeologist must be informed of the start date and timetable in advance of any work commencing.
- 7.1.2 Reasonable access to the site must be afforded to the GAPS archaeologist, or their nominee at all times, for the purposes of monitoring the archaeological excavations.
- 7.1.3 Regular communication between the archaeological contractor, the GAPS archaeologist, client and other interested parties must be maintained to ensure the Glyn Rhonwy Pumped Storage Generating Station aims and objectives are achieved.

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# 8. Public Outreach

- 8.1.1 It is recognized that the archaeological works will generate significant public interest. In response to this a programme of public outreach will be instigated. The project will have an overall environmental liaison officer and an environmental liaison group (via requirement 6 in the Code of Construction Practice) to enable communication for the project to the wider community and beyond. The archaeological outreach programme will work with the environmental liaison officer for maximum benefit.
- 8.1.2 A detailed scope for outreach will be agreed with GAPS in advance of the commencement of the archaeological mitigation works, and may include some or all of the following, as appropriate:
  - A regularly updated social media presence reporting the important discoveries and promoting specific engagement events (e.g. talks, open days etc.) at an appropriate stage;
  - Press releases to local media where particularly significant remains are identified or where specific events are to be promoted and can appropriately be communicated. These would be coordinated and issued through the wider Glyn Rhonwy Pumped Storage Generating Station communications programme;
  - A series of publicly accessible talks, provided by the archaeological fieldwork contractor(s) to local interest groups, such as schools, Parish groups/councils, discussing the excavations, as they progress;
  - An invitation to specialist broadcast media production(s), for example BBC Digging for Britain to cover key findings or major set piece excavations in order to reach a national audience;
  - A publicly accessible conference to be held at a suitable local venue, following the completion of fieldwork and post-excavation assessment, to bring together the most significant results of the archaeological project for a general audience;
  - Where reasonably practicable in a safe manner, open days. This would be most relevant to the larger set-piece excavations;
  - A community volunteering investigation and recording project; and
  - Production of popular publications (additional to the formal publication of results) describing the significant discoveries for a general audience. Any popular publications will be linked to school curriculum at KS2, KS3, KS4.
- 8.1.3 The programme of public outreach will be tailored to the objectives and aims outlined in The Slate Landscape of Northwest Wales Property Management Plan 2020-2030, Action Plan for learning about The Slate Landscape of Northwest Wales:

"Objective 16: The proposed World Heritage Site is a focus for shared learning and research, for fostering understanding and appreciation of its values and attributes.

*Principle 16.1: Links will be established with education-providers to foster opportunities for inclusive learning programmes relevant to the proposed World Heritage Site.* 

*Principle 16.2: Links will be established with international bodies to promote academic research, educational programmes and professional exchanges relevant to the proposed World Heritage Site.* 



Principle 16.3: Visitors will be encouraged to explore and learn about the physical, social and cultural aspects of The Slate Landscape of Northwest Wales.

*Principle 16.4: Researchers will be encouraged to share their knowledge and research findings.*"



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