wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

HORIZON NUCLEAR POWER

WYLFA NEWYDD, ANGLESEY
AREA 5
ARCHAEOLOGICAL POST-EXCAVATION ASSESSMENT REPORT

DECEMBER 2021

wardell armstrong

Wardell Armstrong
41-50 Futura Park, Aspinall Way, Middlebrook, Bolton, BL6 6SU
Telephone: +44 (0)1204 227 227 www.wardell-armstrong.com

DATE ISSUED:	DECEMBER 2021
JOB NUMBER:	CL12283
SITE CODE:	209730
DEVELOPMENT CONSENT ORDER APPLICATION REF:	EN010007
REPORT VERSION NUMBER:	FINAL 1.0

HORIZON NUCLEAR POWER

WYLFA NEWYDD, ANGLESEY

AREA 5 ARCHAEOLOGICAL POST-EXCAVATION ASSESSMENT REPORT

DECEMBER 20211

PREPARED BY:		
Callum Allsop	Principal Archaeologist	
REVIEWED BY:		
Cat Peters	Principal Archaeologist	
APPROVED BY:		
Frank Giecco	Technical Director	

CONTENTS

ILLUSTRATIONS

PLATES (APPENDIX 3)

FIGURES (APPENDIX 4)

SUMMARY

Wardell Armstrong LLP (WA) was commissioned by Horizon Nuclear Power to undertake the post-excavation assessment for archaeological excavations at the new nuclear power station at Wylfa Newydd, Anglesey, Wales, centred on National Grid Reference (NGR): SH 36350 93450. The archaeological fieldwork programme was undertaken in support of a Development Consent Order application (EN010007). The overall fieldwork programme was divided into defined areas and this report details the results of the archaeological excavation at Area 5, which was undertaken in accordance with a Written Scheme of Investigation (WSI) (Horizon Nuclear Power (HNP) 2015), the Technical Update (HNP 2017a) and Community Dig Scope (HNP 2017b). All documents were agreed with Gwynedd Archaeological Planning Service, the archaeological planning advisors to the Isle of Anglesey County Council.

Area 5 was located within a single field, Field A1, within the north western part of the overall project area, centred on NGR: SH 34750 93200. The excavation covered an area totalling 10,086m^{2}and was undertaken over seven days between the 22nd August and 30th August 2017.

The investigation revealed a Bronze Age burnt mound comprising two troughs and an overlying burnt deposit within the southern half of the excavated area. Furthermore, it was established that the burnt mound may have had an associated windbreak to the east, evidenced by a complex of post-holes. The investigation also identified a field boundary, gully and field clearance cairn. Finds suggest the clearance cairn dates to the post medieval period. The linear features are very shallow and perhaps could have been prehistoric in date. They have been recorded as undated.

CRYNODEB

Comisiynwyd Wardell Armstrong LLP (WA) gan Horizon Nuclear Power i gyflawni asesiad ol-gloddio archaeolegol ar gyfer cloddfau archaeolegol ar safle arfaethedig gorsaf bŵer niwclear Wylfa Newydd, Ynys Môn, Cymru, wedi ei ganoli ar Cyfeirnod Grid Cenedlaethol (NGR): SH 36350 93450. Ymgymerwyd ar y rhaglen waith maes archaeolegol i gefnogi cais Orchymyn Cydsyniad Datblygu (EN010007). Rhannwyd y rhaglen gwaith maes i lecynnau diffiniol, mae'r adroddiad hwn yn manylu canlyniadau cloddfa archaeolegol yn Area 5. Cwblhawyd y gwaith yn unol â'r Cynllun Ymchwiliad Ysgrifenedig (CYY/WSI) (Horizon Nuclear Power (HNP) 2015), y Technical Update (HNP 2017a) a'r Community Dig Scope (HNP 2017b). Cytunwyd pob dogfen â Gwasanaeth Cynllunio Archaeolegol Gwynedd, ymgynghorwyr cynllunio archaeolegol Cyngor Sir Ynys Môn.

Lleolwyd Area 5 yng nghae A1 yn ogledd orllewin safle Wylfa Newydd, wedi ei ganoli ar NGR: SH 34750 93200. Roedd y gloddfa yn mesur 10,086m², cwblhawyd y gwaith maes dros saith diwrnod rhwng y 22ain a'r 30ain o Awst 2017.

Darganfyddwyd dwmpath llosg o'r Oes Efydd yn cynnwys dau gafn a lledaeniad o dyddod llosg yn hanner deheuol y gloddfa. I'r dwyrain roedd casgliad o dyllau pyst a allai fod yn dystiolaeth o atalwr gwynt. Hefyd yn ystod yr ymchwiliad nodwyd derfyn cae, rhigol a charnedd garega, mae arteffactau yn awgrymu bod y nodweddion yn dyddio i'r cyfnod ol-ganoloesol.

ACKNOWLEDGEMENTS

Wardell Armstrong LLP (WA) thanks Horizon Nuclear Power for commissioning the project, and for all their assistance throughout the work.

Wardell Armstrong LLP also thanks Ian Halfpenney at CADW. Ashley Batten, Inspector of Ancient Monuments for North East Wales at CADW (formerly of Gwynedd Archaeological Planning Service (GAPS)), Jenny Emmett, Senior Planning Archaeologist at Gwynedd Archaeological Planning Service and Sean Derby, also of GAPS. Thanks go also to Wessex Archaeology who undertook the excavation and subsequent interim report, and to Jones Bros Ltd plant hire company for their help throughout this project.

The assessment report was written by Callum Allsop. The figures were produced by Helen Phillips. The finds assessment was undertaken by Sue Thompson with contributions from Miguel Gonzalez and Megan Stoakley. The environmental team consisted of Megan Lowrie, Katherine Bostock, Paul Sherwood, Sophia Davies and Saskia Winslow and the palaeoenvironmental assessment was undertaken by Freddie Sisson. Lynne Gardiner managed the post-excavation team. The project was managed by Damion Churchill and Frank Giecco, and Cat Peters and Frank Giecco edited the report.

1 INTRODUCTION

1.1 Project Circumstances and Planning Background

1.1.1 In August 2017, Wessex Archaeology undertook an archaeological excavation in Area 5, Field A1, at Wylfa Newydd, Anglesey (centred on NGR: SH 34750 93200; Figure 1). This excavation was one of multiple defined areas excavated as part of a large scheme of works commissioned by the Client who intended to construct a nuclear power station, related plant and ancillary Structures and offsite power station facilities for which a Development Consent Order application has been submitted to The Planning Inspectorate (EN010007).

1.2 Primary reference numbers (PRNs)

1.2.1 Historic Environment Record event numbers ('PRNs') were assigned following discussion between Wessex Archaeology and Nina Steele, Senior Historic Environment Record Archaeologist at Gwynedd Archaeological Trust. PRN45392 has been assigned to the Wylfa Newydd project as a whole and further event numbers have also been assigned to 'noteworthy components' of the project. Those allocated to Area 5 are presented in Table 1.1.

Table 1.1: PRN allocation

PRN	Description	Associated contexts/PRNs
76013	Burnt mound and associated features	Mound spread (5009) and pits [5043] and [5045]
91972	Pit (possibly associated with burnt mound)	[5419]
91973	Complex of postholes and pits, possible windbreak and associated with burnt mound	
91974	Gully, east-west	[5012=5024]
91975	Clearance cairn	{5008}
76014	Boundary ditch, shallow northwest to southeast ditch, c50m in length	[5051]

1.3 Project Documentation

1.3.1 The project conforms to a brief prepared by HNP which was prepared in consultation with the Gwynedd Archaeological Planning Service, the archaeological planning advisor to the Isle of Anglesey Council. A WSI (HNP 2015) was then produced to provide a specific methodology based on the brief for a programme of archaeological excavation. This was agreed with the archaeological planning advisor prior to the fieldwork taking place. This is in line with government advice as set out in Section 5.8

of the National Policy Statement for Energy (EN-1) (Department for Energy and Climate Change 2011).

1.3.2 This report outlines the work undertaken on site at Area 5, the subsequent programme of post-excavation assessment, and the results of this scheme of archaeological excavation.

2 METHODOLOGY

2.1 Standards and Guidance

2.1.1 The archaeological evaluation was undertaken following the Chartered Institute for Archaeologists *Standard and guidance for archaeological field excavation* (2014a), and in accordance with the Wessex Fieldwork Recording Manual (2015).

2.1.1 The fieldwork programme was followed by an assessment of the data as set out in the aforementioned standards (CIfA 2014a), as well as the guidelines from Historic England (MoRPHE 2015) and the *Standard and guidance for the collection, documentation, conservation and research of archaeological materials* (CIfA 2014b).

2.2 The Archaeological Excavation

2.2.1 The excavation at Area 5 comprised the strip map and sample of an area measuring up to 185m in length by 80m in width totalling an area of 10,086m^2, situated in Field A1, in the western half of the proposed development area (Figures 1 and 2). The excavation at Area 5 aimed to target a sub-rectangular ditch feature, revealed by geophysical survey, and identified in the trial trench evaluation to comprise field boundaries and burnt stone material indicative of at least one burnt mound (Wessex Archaeology 2016).

2.2.2 The general aims of these investigations were:

- *to ensure the adequate recording of any archaeological remains revealed by the strip map and sample work;*
- *to identify, investigate and record the character, nature, extent and relationships of the archaeological remains discovered, to the extent possible by the methods put forward in the specification;*
- *to determine (so far as possible) the stratigraphic sequence and dating of the deposits or features identified;*
- *to integrate the results of the work into the wider historic and archaeological context of the landscape and to address relevant regional research objectives where applicable and so far as is possible;*
- *to disseminate the results through deposition of an ordered archive at the suitable repositories for both physical and digital material, the deposition of a detailed report at the Historic Environment Record (HER) and publication at a level of detail appropriate to the significance of the*

results;

- *to undertake the works in such a way as to allow sufficient data to be gathered to address the various research objectives outlined below. This includes the investigation and recording of features, the identification, recording and collection of artefacts and ecofacts (including environmental samples) and the use of appropriate analytical methodologies / techniques when examining the record / artefacts.*

And specifically, to address archaeological research objectives posed by the Research Framework for the Archaeology of Wales (CIfA Cymru/Wales 2017; cf. Hounsell 2017)

- Confirmation of the date, nature, character and extent of potential prehistoric sites in an order that can be placed into the wider context of Anglesey during this period. There is particular emphasis on obtaining accurate C14 dates in order that the chronology of sites and ceramic sequences can ascertained.
- There is an emphasis on understanding the wider settings of prehistoric sites – with specific reference to 'Understanding how sites work in the landscape, permanent/seasonal use and understanding the social role of hillforts' (Gale, 2010). It is possible that the remains within the proposed investigation area form part of the wider setting of the prehistoric remains seen in the fields to the south.
- To undertake detailed analysis of prehistoric artefacts and their contexts in order to understand the chronological and typographic development, and use, of the artefacts.
- Placing the setting of the information gained from the archaeological investigation into a broader regional and national (including Britain and Ireland) context.
- Gaining insights into the local farming economy and the wider exploitation of the natural environment – with particular reference to the exploitation of lakes and bogs.
- Identifying and understanding early field systems, their development and degree of continuity.

- Further understanding and identification of pasture land in locations other than upland locations – specifically such locations as coastal wetlands, elevated wetlands and moors.
- Develop our understanding of known, but poorly understood, monument types - such as burnt mounds and rock art.

2.2.3 Deposits considered not to be archaeologically significant were removed by a 360˚ tracked mechanical excavator with a toothless ditching bucket, under close archaeological supervision. The area was subsequently cleaned by hand. All possible features were inspected, and selected deposits were excavated by hand to retrieve artefactual material and environmental samples. Once completed all features were recorded according to the Wessex standard procedure as set out in the Fieldwork Recording Manual (Wessex Archaeology 2015).

2.2.4 On completion the excavated area was reinstated by replacing the excavated material in the reverse sequence of which it was removed. Topsoil and subsoil were excavated and stored separately to prevent mixing

2.2.5 All finds encountered were retained on site and returned to WA Carlisle office where they were identified, quantified and dated to period. A *terminus post quem* was then produced for each stratified context under the supervision of the WA Finds Officer, and the dates were used to help determine the broad date phases for the site. On completion of this project, the finds were cleaned and packaged according to standard guidelines (Watkinson and Neal 2001). Please note, the following categories of material will be discarded after a period of six months following the submission of this report, unless there is a specific request to retain them (and subject to the collection policy of the relevant depository):

- unstratified material;
- modern pottery;
- and material that has been assessed as having no obvious grounds for retention.

2.2.6 A full professional archive has been compiled in accordance with the project specification, and the Archaeological Archives Forum recommendations (Brown 2011). The paper archive and digital data, including photographs, will be lodged with the Royal Commission on Ancient and Historical Monuments of Wales (RCAHMW) in Aberystwyth on completion of the project. The material archive can be accessed under

the unique project identifier WA19/CL12283/Area 5/35-2016.

2.2.7 In this report, the work is primarily summarised by investigation for clarity but related features and remains are linked throughout. Where contexts could be identified between the investigations they have been done so and the evaluation contexts are integrated into the excavation phased narrative where applicable.

2.2.8 Within the defined Periods (see below) broad phasing has been ascribed to the features, deposits and structures encountered during the investigations, and the results are presented below in chronological order. The Periods used are derived from those identified in the Research Framework for the Archaeology of Wales (CIfA Cymru/Wales 2017) and are consistent throughout the different Areas of work, but within these the Phases may not be directly compatible. The dating and phasing is provisional as is appropriate for an assessment of the site and may be refined in the light of evidence produced from detailed analysis of the dataset. It is also noted that imposing rigidly defined periods on a continuous process is somewhat of a contrivance but is done so for simplicity.

- Period 0 Natural Drift Geology
- Period 1 Palaeolithic and Mesolithic 250 000 – 4000 BC
- Period 2 Neolithic and Early Bronze Age 4000 – 1500 BC
- Period 3 Late Bronze Age and Iron Age 1500 BC – AD 43
- Period 4 Roman AD 43 - 410
- Period 5 Early Medieval AD 410 – 1100
- Period 6 Medieval AD 1100 - 1539
- Period 7 Post-medieval AD 1539 - 1750
- Period 8 Industrial and Modern AD 1750 – present
- Undated

3 ARCHIVE QUANTIFICATION

Category	Quantification
Context Sheets	53
Small finds	None
Bulk finds (after Environmental processing)	Count 39, Weight 5.92kg
Environmental samples	5 samples (140L)
Monochrome film	None
Digital photographs	250 JPEGS (1.67 GB)
Rectified photographs	None
Hand drawn plans	3
Hand drawn sections	29
GPS survey pre-excavation plans	Yes
GPS survey excavation plans	Yes
TST surveyed excavation plans	No

4 BACKGROUND

4.1 Location and Geological Context

4.1.1 The proposed development site is located on the north Anglesey coast approximately 2km west of the village of Cemaes (Figure 1). The nearest village is Tregele, approximately 1km to the south-east.

4.1.2 Area 5 is located at NGR: SH 34750 93200 in Field A1 in the western half of the proposed development area. The Cemlyn to Tregele road lies to the south and the coastline, 320m to the north, and Area 5 is situated at the base of a small hill falling from south-south-east to north-north-west between 25m to 10m aOD (above Ordnance Datum). The existing nuclear power station, built in the 1960s, lies *c.* 500m to the northeast.

4.1.3 The area of excavation extended to approximately 10,086m^2 and was rhomboid in shape (Figure 2). At the time of excavation, Area 5 comprised improved agricultural land characterised utilised as enclosed grazing fields.

4.1.4 The underlying solid geology within the area of investigation is mapped as mica schist and psammite of the New Harbour Group formed during the Ediacaran period between 635 and 541 million years ago. This is overlain by superficial deposits of Devensian Till deposited up to 2 million years ago during the Quaternary period (BGS 2019). The natural substrate observed during the current phase of works comprised schist bedrock overlaid by mid orangey-brown, sandy clay which is consistent with

the mapped geologies above.

4.2 Historical and Archaeological Background

4.2.1 An archaeological baseline assessment was produced to assess the known historical and archaeological background of the site and the surrounding landscape to a distance of 6km (GAT 2012b). It is not intended to repeat that information here and what follows is a brief overview, for further details please refer to the original document.

4.2.2 ***Period 1 - Palaeolithic and Mesolithic (25 000–4000 BC):*** There is no known Palaeolithic or Mesolithic activity within Area 5. The earliest known activity on Anglesey is in the form of Mesolithic flint scatters located close to the coast, south of the proposed development area (GAT 2012b).

4.2.3 ***Period 2 – Neolithic and Early Bronze Age (4000 – 1500 BC):*** There is no previously known Neolithic or Early Bronze Age activity within Area 5, although the presence of a burnt mound has been suggested by the discovery of possible burnt mound deposit material during the trial trench evaluation. Burnt mounds typically date to the Bronze Age (*c.* 2600-700 BC) and are common throughout Anglesey and North Wales (GAT 2012b). These are usually located near to, or alongside watercourses either in groups or individually (*ibid*). The evaluation phase in the wider development area has encountered a substantial burnt mound associated with a large number of pits which contained both prehistoric pottery and lithic tool debitage and an unusual, coastal burnt mound, in the eastern part of the overall site (Wessex 2016).

4.2.4 Across Anglesey, other remains of this date include megalithic and ceremonial sites, funerary sites, artefact scatters and find spots, with a small amount of settlement evidence from postholes and pits. A change in burial rites in the prehistoric period is also evident in Anglesey, with communal burial practices abandoned in favour of individual burials in the form of urn burials containing cremated remains and inhumations within cists.

4.2.5 ***Period 3 – Late Bronze Age and Iron Age (1500 BC – AD 43):*** There is no previously known Late Bronze Age and Iron Age activity within Area 5.

4.2.6 Evidence for activity of this period on Anglesey comes from hillforts, small enclosed settlement sites (roundhouses, fields etc) and finds including hoards, but very little funerary evidence (GAT 2012b, Cuttler *et al.* 2012). Hillforts and related fortifications continue from the latter part of the Bronze Age into the Iron Age (*c.* 800 BC-43 AD). One of the largest promontory forts on the island is at Dinas Gynfor, located almost

3km northeast of the Wylfa Newydd Development Area.

4.2.7 The archaeological evaluation trenches in Fields L8 and L12 uncovered significant prehistoric activity in the form of a hilltop ring ditch, in the eastern part of the overall development site (Wessex 2016). Late Iron Age to Early Roman activity was also seen in Field F1 to the east of the present power station, with significant contemporary settlements to the east and south-east of Area 5, in Fields E3 and O5.

4.2.8 ***Period 4 – Roman (AD 43 – 410):*** There is no known Roman activity within Area 5. Anglesey was invaded in *c.* AD 60-61 by the Roman army and there is evidence in the wider area of settlement sites, ephemeral military establishments (Jacobs 2015), scatters of Roman artefacts and Romano-British enclosure sites. Evidence for Roman settlement is currently absent on the northern part of Anglesey where activity is predominantly evidenced by finds of Roman artefacts and Romano-British enclosure sites. Features encountered during the present excavation works across the development site, found to have been in existence in the Later Iron Age, appear to have continued into the Early Roman period, e.g. in Fields F1, E3 and O5.

4.2.9 ***Period 5 - Early Medieval (AD 410 – 1100):*** There is no known Early Medieval activity within Area 5. Early Medieval remains have been uncovered to the north-east in Field L1 in Area 12 and a cemetery in Area 15 (Headland 2017, 15-18). A possible Early medieval cemetery has also been excavated within Area 7, 200m to the south, but no bone survived to allow confirmation through radiocarbon dating.

4.2.10 Evidence for early medieval settlement in Anglesey is largely based on references made in documentary sources (Headland Archaeology 2017) which suggest a pattern of disparate farming sites located close to small ecclesiastical complexes across the island (*ibid*).

4.2.11 Archaeological excavations have established that there is often a spatial relationship between early medieval settlement sites and cemetery site locations on Anglesey (Jacobs 2015) and it is thought that the use of long cist burials is consistent with the wider Welsh Christian burial practices of the 8th to 9th centuries (*ibid*). Other evidence comes from occasional findspots which include inscribed stones and a rare small fortified site at Porth Wen which may have related to Viking raids of the 9th century.

4.2.12 ***Period 6 - Medieval (1100 – 1539):*** By the 12th century, Area 5 was located within the *Talybolion commote* (a recognised regional unit of royal administration) with a royal manorial centre located at Cemaes (GAT 2012b).

4.2.13 The Talybolion commote was subsequently sub-divided into a number of smaller administrative centres called '*trefi*' (Jacobs 2015) which included: the ecclesiastical parishes of Llanfechell and Llanbadrig; the townships of Cemaes, Clegyrog, Llanfechell and Caerdegog; and the hamlet settlements of Cafnan, Tre'r Gof, Gwaunydog and Llanddygfael (*ibid*).

4.2.14 Documentary sources indicate that the pattern of medieval settlement on Anglesey during this period was characterised by largely unequal settlements with discrete areas of nucleation (Jacobs 2015). This pattern influenced later post-medieval and early-modern patterns and survives as agricultural land with intermittent farmsteads, small hamlets, and villages (*ibid*).

4.2.15 Archaeological evidence indicates that the practice of open-field farming, narrow strips of arable pasture within large unenclosed fields located close to settlements, was common and there is evidence of ridge-and-furrow, associated land clearance cairns, terraces, field boundaries, open fields, pens and small enclosures.

4.2.16 The medieval landscape also contained agricultural buildings, domestic dwellings, mills and other structures, though none are known to survive as complete upstanding remains. Only ecclesiastical structures show such survival on Anglesey. The distribution of medieval churches and settlement sites varies to include churches situated at the centre of each village or hamlet, and churches on the periphery of known settlement sites.

4.2.17 In Field L2, several trenches revealed the presence of a large east-west aligned ditch, the upper fill of which contained occasional charcoal flecks and a sherd of 13-14th century medieval pottery (Headland 2017, 15).

4.2.18 ***Period 7 - Post-medieval (1539 – 1750):*** During the 17th and 18th centuries, Cemaes and Cemlyn Bay became principle centres for shipbuilding and fishing, and, later, brickmaking and copper mining (*ibid*).

4.2.19 Although the rural landscape established during the medieval period continued into the post-medieval period there were fewer landowners controlling larger areas of land, moving to more of an 'estate' type system, with additional houses and farmsteads established.

4.2.20 ***Period 8 – Industrial and Modern (AD 1750 – present):*** In the 19th century, small-scale gentrification of the countryside continued with the construction of larger country houses and farmhouses and/or the remodelling of existing ones.

4.2.21 Agricultural land improvements to increase productivity during the post-medieval period were introduced, such as changes to farming techniques, ploughing, manuring, enrichment, drainage, stock breeds and crop choices. Late 18th to 19th century land improvements may have removed any remains of earlier surface and buried near surface features, though fairly deep soils may have protected features cut into the substrata.

4.2.22 The recorded remains of post medieval field boundary systems form only part of the preserved landscape. For example, documented and existing boundaries may have been in place much earlier and subsequently denuded and buried, with newer ones added to extend areas of ownership or use.

4.2.23 The archaeological evaluations (Headland 2017, Wessex 2016) have demonstrated that this is not the complete picture and that there is a more complex landscape on Anglesey spanning the medieval to post medieval periods. Upstanding elements that can survive include clawdd (plural cloddiau) which can refer to a ditch or bank, and frequently appears in place-names (CPAT 2002, 8). Within northwest Wales, the term is usually used to describe an earthen bank, often stone-faced (*ibid*). An unusual feature of stoneclad cloddiau is that the facing stones are commonly laid with their long axis vertical (DSWA 2013).

4.2.24 With the Industrial Revolution, the amount of industrial activity on Anglesey, such as mining, quarrying and brickmaking, dramatically increased from the late 18th century onwards but declined in the early 20th century.

4.2.25 Population varied during this period with associated fluctuations in buildings such as new/ remodelled wealthy dwellings, and more functional and modest ones becoming more common. This can be particularly identified for wartime accommodation and the more recent Power Station construction.

4.2.26 In 1960, the Central Electricity Generating Board (CEGB) applied for consent to build the existing Power Station with consent being granted in late 1961 (*ibid*). In 1963, work began on the construction of the two Magnox reactors (*ibid*). Building works continued throughout the 1960s, with Wylfa being the last and largest of this design of reactor (*ibid*). The construction of the two Magnox reactors and the Central Electricity Generating Board (CEGB) Power Station was a huge undertaking, involving 13m deep excavations. This work took place between 1963 and 1972. The Existing Power Station was officially commissioned in 1972 (*ibid*).

4.3 Previous Work

4.3.1 ***Documentary Research:*** An archaeological desk-based assessment was originally prepared in 2012 by Gwynedd Archaeological Trust (GAT 2012b), which set out the archaeological and historical background of the site and provided an assessment of the significance of all known and potential heritage assets up to 6km from the area of investigation to support the site preparation and clearance phase of works. An updated desk-based cultural baseline assessment was prepared by Jacobs (2015) to support the DCO application.

4.3.2 The desk-based assessment summary for archaeological potential was divided into 15 zones, of which Area 5 was within Zone A, a 0.17km^2 area centred on NGR: SH 34890 93290 in the northwest of the proposed development area. The summary concluded that Zone A had been partially disturbed by the construction of the existing power station and that late 18th to 19th century land improvements had probably removed most earlier surface and buried near surface features, although deep soils may have protected features cut into the substrata.

4.3.3 The zone is drained by a forked tributary of the Afon Cafnan, which runs from north to south and then marks the southern boundary of Zone A (GAT 2012b, 20-21 & Figure 23). The gently sloping terrain would have made the area favourable for settlement, especially towards the watercourse and on the nearby drumlins. There is potential for Bronze Age burnt mounds along the watercourse and for post medieval or possibly earlier field boundaries across the whole zone (GAT 2012b).

4.3.4 ***Geophysical Survey:*** The results of the geophysical survey within Area 5 identified a sub-rectangular ditch feature, interpreted as a possible prehistoric enclosure (GAT 2012a).

4.3.5 ***Archaeological Evaluation:*** Forty evaluation trenches were excavated within field A1, covering 3684 square metres (Wessex Archaeology 2016, 11). Thirteen of the trenches contained archaeology, eight of which fell outside of the Area 5 excavation area: Trenches 2, 7, 10, 15, 720, 728, 730 and 731. Undated ditches were recorded in T2, T7, T10 (two ditches), T15, T720, T728, T730 and T731. Undated discrete features wer recorded in T15 (a pit and a posthole) and T728 (two pits). The only feature within Field A1 which receives specific mention within the Wessex report is the Burnt mound found in Trench 21: (Wessex Archaeology 2016, Figure 1.11; Plate 12). The result of the evaluation was that the sub-rectangular ditch feature, revealed by the geophysical survey and thought to have been a possible prehistoric enclosure, was reinterpreted

as a series of field boundaries.

5 ARCHAEOLOGICAL EXCAVATION RESULTS

5.1 Introduction

5.1.1 The excavation of Area 5 was undertaken between the 22nd August and 30th August 2017, in Field A1 of the proposed development site (Figure 2). The site measured up to 185m in length by 80m in width and had a minimum depth of 0.29m and maximum depth of 0.80m. The area was designed to target several field boundaries and burnt stone material indicative of at least one (1) burnt mound as specified in the Methodology (Section 2). A full description of contexts is given in Appendix 1.

5.1.2 Results are detailed below, deposit numbers are given in **(parenthesis)**, cut numbers are given in **[square brackets],** and structure numbers are given in **{braces}**.

5.2 Results

5.2.1 ***Period 0 Natural***

5.2.2 The geological bedrock **(5052)** consisted of schist rock. The overlying natural substrate **(5003)**, comprised a mid orangey-brown, sandy clay, and was overlain by a 0.08-0.58m thick deposit of mid orangey-brown, sandy silt, subsoil **(5002)**. The site was sealed by a mid brown, silty clay, topsoil **(5001)** between 0.10m and 0.45m thick.

5.2.3 A small fragment of worked flint was recovered from subsoil **(5002)**, which was probably *ex-situ* as a result of ploughing.

5.2.4 Areas of bioturbation cutting into the natural substrate **(5003)** were present throughout the site **[5004]**, **[5006]**, **[5010]**, **[5014]**, and **[5016]** (Figure 6; Plate 9). All instances of bioturbation contained a single fill, **(5005)**, **(5007)**, **(5011)**, **(5015)**, and **(5016)**.

5.2.5 ***Phase 1: Period 3 –Late Bronze Age and Iron Age***

5.2.6 Cutting into the natural substrate **(5003)**, were a variety of archaeological features, the earliest of these a burnt mound with associated features, all situated within the southern half of the excavation area (PRN76013; Figure 5).

5.2.7 Underlying the mound material **(5009)**, were two pits, **[5043]** and **[5045]**. Pit **[5043]** was a sub-oval in plan with moderate concave sides and a flat base measuring 3.95m long, 2.23m wide, and 0.77m deep (Figure 8; Plate 1). Pit **[5043]** contained a single fill **(5044)**, comprising a mottled dark brown and orange, sandy clay with large sub-rounded and sub-angular stones, medium heat affected stones, and charcoal flecks. **[5045]** was a sub-rectangular cut with vertical straight sides and flat base measuring

2.40m long, 1.35m wide, and 0.43m deep (Figure 8; Plate 2). The second pit **[5045]** contained a single fill **(5046)**, comprising heat affected stones with 20% dark black brown, silty sand, rooting, and rare charcoal flecks. Both pits **[5043]** and **[5045]** contain fills indicative of their final uses prior to the overlying burnt mound deposit **(5009)**. Burnt mound deposit **(5009)** was triangular shape in plan. It covered an area measuring 13.00m long and 8.6m wide and had an average thickness of about 5cm. It comprised a dark brown sandy clay with orange mottling, containing large sub-rounded and sub-angular stones, medium heat affected stones, and charcoal flecks (Plate 3).

5.2.8 Finds recovered from environmental samples taken from **(5009)** and **(5046)** comprised heat-affected stone. The presence of heat-affected stone in both the burnt mound material **(5009)** and the fill of an underlying pit **(5046)** could indicate that the two features were part of a burnt mound and trough system. There is further evidence for this from the charcoal recovered from **(5009)** indicating *in-situ* burning. Radiocarbon results from a sample taken from the burnt mound deposit **(5009)** provided a likely date range of 1003-844BC, and from a sample from the fill of one of the underlying pits **(5046)** , a likely date range of 1108-916BC, indicative of late Bronze Age activity (*confer* 6.3).

5.2.9 Features, likely associated/contemporary with burnt mound deposit **(5009)**, included pit **[5049]** situated immediately to the south (Figure 5). Pit **[5049]** was oval in plan with shallow concave sides and concave base measuring 1.38 m long, 0.84 m wide and 0.10 m deep (Figure 8; Plate 4). This was assigned PRN91972. Pit **[5049]** contained a firm, dark brownish-grey, sandy clay, **(5050)**, and is indicative of a possible rake-out pit. No environmental samples were taken.

5.2.10 Immediately to the east of burnt mound deposit **(5009)**, was a complex of postholes and small pits **[5037]**, **[5039]**, **[5041]**, and **[5047]**, which may once have formed a windbreak (Figure 5). These have been assigned PRN91973. Post-holes **[5039]** and **[5041]** were broadly circular, with straight to concave sides, and U-shaped to flat bases, and measured between 0.26m and 0.43m in diameter and 0.17m and 0.22m in depth (Figure 7; Plate 5). Post-holes **[5039]** and **[5041]**, were filled with greyish-brown to dark brown, silty sand to sandy silt **(5040)** and **(5042)**, with abundant, well-sorted rounded to sub-angular stones forming the post-packing. Small pits **[5037]** and **[5047]** were broadly sub-rectangular to oval with shallow straight to concave sides and flat to concave bases and measured between 0.50m and 0.57m in length, 0.29-1.20m in

width, and were 0.13m deep (Figure 7; Plate 5). Small pits, **[5037]** and **[5047]**, contained a single fill comprising a greyish-brown to dark brown, silty sand to silty loam, **(5038)** and **(5048)**. Heat-affected stones were recovered from the environmental samples taken from **(5040)** and **(5042)** indicating possible burning occurring within the immediate environs.

5.2.11 ***Phase 2: Period 7/8 – Post Medieval/ Industrial***

5.2.12 The northernmost feature was field clearance cairn **{5008}** overlying the natural substrate **(5003),** comprising a mound of sub-angular pebbles, cobbles and boulders in a sub-circular shape and measuring 6.00m long and 5.40m wide (Figure 6; Plate 10) (PRN91975). This also contained modern plastic and other debris. Post-medieval to modern pottery, ceramic building material, glass, metal, and animal bone were recovered from **{5008}**, typical of a field clearance cairn. No environmental samples were taken.

5.2.13 ***Undated features***

5.2.14 Across the centre of Area 5 and to the north of the earlier features, a shallow ditch, **[5051]**, ran northwest to southeast (PRN76014), continuing beyond the eastern limit of excavation, for a distance of over 50m long, and measured 1.35m in width and 0.19m in depth (Figures 4 and 5). Ditch **[5051]** was broadly linear with moderate concave sides and a flat to rounded base (Figures 6 and 7; Plate 6). The ditch **[5051]** contained two fills, with the secondary fill consisting of a broadly light yellowish/greyish/dark-brown, sandy silt to sandy loam with sparse sub-rounded and sub-angular stones **(5019=5027=5031=5032=5034=5036)**. Towards the centre of the ditch **[5028]**, a primary fill, **(5029)**, underlay the homogenous ditch fill, **(5032)**, and consisted of dark orange, sandy silt, 0.07m thick with rare small sub-angular stones (Figure 7; Plate 7). Ditch **[5051]** did not correlate to any known boundaries depicted on historic maps, and the shallow ephemeral nature suggests it has been heavily truncated by ploughing. No suitable environmental samples were taken from this feature.

5.2.15 In the northern half of Area 5, the western extent, a gully ran east to west, beyond the limit of excavation measuring over 2.00m long, 0.56m wide and 0.28m deep **[5012=5024]** (PRN91974). The gully was broadly curvilinear with moderate to steep concave sides and an irregular to concave base (Figures 6 and 7; Plate 8). The gully contained a single fill, that broadly comprised a loose, light reddish-grey to dark brownish-grey, sandy clay with angular boulders, coarse gravels, and charcoal flecking

(5013) and **(5025)**. No suitable environmental samples were taken from this feature.

6 FINDS ASSESSMENT

6.1 Introduction and Methodology

6.1.1 A total of 43 artefacts, weighing 1,794g, were recovered from the archaeological excavation of Area 5. Finds were recovered from three contexts and were in poor to moderate condition and frequently abraded. Quantification of bulk finds by material and context is given in Tables 5.1 and 5.2. Finds from environmental samples are recorded in Table 5.3.

6.1.2 All finds were dealt with according to the recommendations made by Watkinson & Neal (1998) and to CIfA guidance (CIfA 2014b). All artefacts have been boxed according to material type and conforming to the deposition guidelines recommended by Brown (2011), EAC (2014) and Oriel Ynys Môn. The project has the unique identifier WA19/CL12283/Area 5/35-2016. The material archive has been assessed for its local, regional and national potential in line with the archaeological research framework for Wales (CIfA Cymru/Wales 2017).

6.2 Industrial Pottery

6.2.1 Twenty sherds of Industrial to Modern pottery, weighing 352g, were recovered from contexts **(5003)** and **{5008}**, displaying frequent post-depositional abrasion. All of the pottery is of 19th to early 20th century date. The modern pottery from context (**5003**) should be considered intrusive and considered unstratified. No further analysis is warranted on the pottery.

6.2.2 The pottery was examined with a x10 hand lens and recorded according to national guidelines (PCRG, SGRP & MPRG 2016). Where possible, mnemonic fabric codes were assigned when they could be identified; this was undertaken using material published by MOLA (2015).

6.2.3 The pottery comprised black glazed red earthenware (CRE), refined white earthenware (REFW) and stoneware. The sherds recovered from Area 5 were undecorated. The vessel types represented in this assemblage are typical domestic wares including large red earthenware bowls or pancheons used for a wide range of household chores which tended to be manufactured locally in the 18th and 19th century. White earthenware tablewares were cheaply mass produced in centres such as Staffordshire and typical of the crockery seen in every household during the 19th century (Licence 2015). Refitting fragments of a grey stoneware jar were also recovered.

6.3 Ceramic Building Material (CBM)

6.3.1 A total of five fragments of CBM were recovered from contexts **(5003)** and **{5008}** with a combined weight of 1,004g. The fragments were in moderate condition. A date range of post-medieval to modern is likely for the CBM and ceramic fragments. The CBM recovered from context (**5003**) should be considered intrusive and considered unstratified. No further work is justifiable.

6.3.2 The CBM comprised fragments of likely floor tile or paver (McComish 2015). The tile fragments measured 40mm in thickness, though the size of the complete tiles is not known. The tiles were made of a very coarse, hard fired red fabric with very frequent ill-sorted inclusions. The tiles were well made, with regular flat edges and surfaces. No makers marks were seen. An abraded stone-glazed ceramic drain fragment was also recovered from **{5008}**.

6.4 Glass

6.4.1 Eleven shards of glass weighing a total of 112g were recovered from contexts **(5003)** and **{5008}** and were in poor condition with frequent breaks and moderate abrasion. All have a likely date range of 19th to 20th origin. The glass fragments recovered from context (**5003**) should be considered intrusive and considered unstratified. No further analysis is warranted.

6.4.2 The glass shards comprised clear bottle glass including medicine and drinks bottles, and two fragments of a single glass bottle stopper. Three sherds of a possible bowl of clear glass with an amethyst tinge were also recovered.

6.5 Lithics

6.5.1 A single shiny brown flint (6.5g) comprising a debitage chip was recovered from the subsoil **(5002)**. No further work is recommended.

6.6 Metal: *Fe*

6.6.1 A single metal artefact was recovered from context **{5008}** comprising a short length of iron chain link weighing 193g. The chain comprised five elliptical links each measuring 45x30mm or 70x40mm, which were highly corroded. The chain is a likely agricultural artefact of post-medieval to modern date, and no further work is warranted.

6.7 Animal Bone

6.7.1 Four fragments of animal bone, weighing 132g, were recovered from contexts **(5003)**

and **{5008}** (Table 1). The bone is in bad condition with poorly preserved surfaces which are prone to laminating/flaking. The animal bone recovered from context (**5003**) should be considered intrusive and considered unstratified. Recording and identification of the animal bone follows guidelines published by Historic England (2019).

6.7.2 The number of identified specimens (NISP) from this site comprises of two. The bone comprises post-cranial elements from cattle and is likely the remnants of domestic food waste. No butchery, canid/rodent gnaw-marks or pathologies were observed. The fragments are of unknown date. No further analysis is recommended.

6.8 Finds from Environmental Samples

6.8.1 A total of 2,347g of material was recovered from five environmental samples (Table 3); see environmental section for recovery methods. These were initially recorded as CBM or fired clay, but during assessment they were deemed to be heat-affected stone. No further work is required on this material as they offer no potential for enhancing any archaeological interpretation.

6.9 Statement of Potential

6.9.1 The finds assemblage is Industrial to modern in date and was recovered from essentially unstratified deposits. As such, it is of low archaeological potential. No further analysis would be required for the pottery, CBM, glass, metal or animal bone. It is possible that the single flint could be worthy of inclusion in a study of similar objects from other sites excavated as part of the wider project.

Table 5.1: Quantification of Finds by Context and Material

Context	Material	Quantity	Weight (g)	Period	Comments
5003	Animal Bone	2	117	-	Bovid
5008	Animal Bone	2	15	-	Bovid
5003	CBM	4	196	Industrial-Modern	Floor tile fragments. 40mm in depth
5008	CBM	1	785	Industrial-Modern	Floor tile fragment. 40mm in depth
5008	Ceramic	1	23	Industrial-Modern	Stoneware drain fragment. Abraded
5002	Flint	1	1		
5003	Glass	1	15	Modern	Clear bottle glass. Multiple breaks
5008	Glass	10	97	Industrial-Modern	Clear bottle glass. Glass stopper. Bowl?
5008	Iron	1	193	Industrial-Modern	Chain links. 45x30mm and 70x40mm links
5003	Pottery	3	187	Industrial	Red earthenware, black glazed. 3 vessels. Abraded. Pancheons
5003	Pottery	5	37	Industrial-Modern	Stone ware jar. Rim. 1 vessel
5003	Pottery	6	39	Industrial-Modern	Refined white earthenware. Table ware. Min 3 plates
5008	Pottery	1	67	Industrial	Red earthenware black glazed. Abraded. Pancheon
5008	Pottery	5	22	Industrial-Modern	Refined white earthenware. Table ware - Plates
Total		**43**	**1794**		

Table 5.2: Quantification of Lithics

Context no.	Raw Material							Measures				Class	Category	Subcategory
	Type	Colour	Lustre	Texture	Opacity	Cortex	Patination	L	W	T	Wgt			
5002	Flint	Brown	Shiny	Fine	Opaque	Nco	Light	21	13.6	6.5	1.22	Debitage	Chip	Chip

Table 5.3: Finds from Environmental Samples

Context	<E>	Qty 11-50	Qty 51-150	Weight (g)	Comments
5009	5001	Yes	No	356	Noted as CBM but changed to Heat-affected stone
5009	5002	No	Yes	415	Noted as CBM but changed to Heat-affected stone
5046	5003	No	Yes	1157	Noted as CBM but changed to Heat-affected stone
5009	5002	No	Yes	142	Noted as fired clay but changed to Heat-affected stone
5009	5001	No	Yes	246	Noted as fired clay but changed to Heat-affected stone
5042	5004	Yes	No	26	Noted as fired clay but changed to Heat-affected stone
5040	5005	Yes	No	5	Noted as fired clay but changed to Heat-affected stone

7 ENVIRONMENT ASSESSMENT

7.1 Introduction

7.1.1 Five bulk samples were taken during the excavation on Area 5. A total weight of 166kg (92l) of sediment was processed for this stage of works. Further details for each sample can be found in Table 6.1.

7.2 Methodology

7.2.1 This report presents the results of the assessment of the environmental samples, palaeobotanical and charcoal remains in accordance with Campbell et al. (2011) and English Heritage (2008). The assessment will establish the significance of the material and will only provide identifications where it was practicable to do so, such as, small quantities of plant material or charcoal identifications where radiocarbon determinations are sought. The report will focus on the preservational qualities and note the potential of the material to warrant analysis.

7.2.2 The bulk environmental samples were processed at Wardell Armstrong LLP. The colour, lithology, weight and volume of each sample was recorded using standard Wardell Armstrong pro forma recording sheets. cf. Table 6.2. The samples were processed with 500-micron retention and flotation meshes using the Siraf method of flotation (Williams 1973). Once dried, the residues from the retention mesh were sieved to 4mm and the artefacts and ecofacts removed from the larger fraction and forwarded to the finds department. The smaller fraction was scanned with a magnet for microslags such as hammerscales. This fraction was then examined for smaller artefacts such as beads. Once fully sorted, and all relevant material removed, the retent residues were discarded.

7.2.3 The flot plant macrofossils and charcoal were retained and scanned using a stereo microscope (up to x45 magnification). Any non-palaeobotanical finds were noted on the flot pro forma, cf. Table 6.2. Once fully sorted and all relevant material removed the flots were discarded.

7.2.4 In the absence of single growth entities such as charred plant remains and hazel nutshell fragments charcoal will be utilised for radiocarbon determinations. Charcoal was only identified to species to select the shortest-lived species for radiocarbon determination once the report author had determined what they would like dated. Where no short-lived species were observed the youngest i.e. twig, branch or periderm fragments from longer-lived species were selected. Once this was achieved

no further identification was undertaken. Identification was undertaken using Hather (2000), Schweingruber (1982) and the author's own reference collection. Nomenclature followed Stace (2010).

7.3 Results

7.3.1 Sandy silt dominated the samples' sediment matrix with lesser quantities of sandy/silty clay sediments, further data can be observed in Table 6.1, with flot and finds from sample date in Table 6.2.

7.3.2 Artefactual material recovered from the dried residues were minimal but contained examples of ceramic building material (CBM) and fired clay.

7.3.3 CPR: no charred plant remains were recovered from Area 5.

7.3.4 CHARCOAL: Charcoal was present in all five samples and was in relatively good condition. Of these three samples yielded over 5g these were: **(5009) <5001>** and **(5009) <5002>** both from a burnt mound layer and **(5046) <5003>** from the fill of a trough. Two samples were selected for radiocarbon dating; Rosaceae charcoal was present in sample **<5002>** and hazel (*Corylus avellana*) charcoal in **<5003>**.

7.3.5 SHELL: No shell was recovered from Area 5.

7.3.6 BONE: No bone was recovered from the samples of Area 5.

7.3.7 MAGNETIC MATTER: Magnetised material was present in all samples and was examined for microslags under a microscope (x45 magnification). No microslags were present, the material comprising small heat affected stones.

7.4 Radiocarbon samples

7.4.1 Two charcoal samples were submitted to Beta Analytic for radiocarbon determination. The samples were treated according to Beta Analytics methodology (Beta Radiocarbon Dating unpub.). The production of the radiocarbon age followed Riemer *et al.* (2013) and was calibrated to the calendar timescale following Bronk Ramsey (2009). The results are presented in Table 6.3.

7.4.2 A sample of rose (*Rosacea* sp.) charcoal from sample **<5002>** from burnt mound deposit **(5009)** provided a radiocarbon age of 2780±30 BP (Beta-554950, 95.4% probability 1003-844 calBC). A sample of hazel (*Corylus avellana*.) charcoal from **<5003>** of fill **(5046)** of trough **[5045]** provided a radiocarbon age of 2840±30 BP (Beta-554951, 93.9% probability 1108-916 calBC).

7.5 Discussion

7.5.1 From the charcoal recovered in **<5003>** it is likely to be part of the backfill of the trough. The charcoal from **<5001>** and **<5002>** appears to have been burnt in situ and was identified as rose-family (Rosaceae) and hazel using nomenclature in Stace (2010). The burning of rose may be circumstantial but in the wider landscape we see hazel being burnt across Anglesey as a fuel source at sites such as Melin y Plas, Penmynydd and Ty Mawr. (Gale in Cuttler et al., 2012). These sites range from Neolithic through to Roman Britain and would suggest that hazel was regularly and possibly managed to ensure it was available as a long-term fuel source.

7.5.2 The radiocarbon dates from samples from the fill of a trough **[5045]** and from the overlying burnt mound deposit **(5009)** are both indicative of a Bronze Age date for this activity.

7.6 Statement of potential and recommendations

7.6.1 The charcoal (listed in 6.3.4) has potential to provide further information about fuel usage and husbandry across Anglesey and into the wider North Wales landscape. It is recommended that analysis is undertaken to address these issues. These deposits must be securely dated prior to analysis.

7.6.2 *Radiocarbon suitability*: material from samples listed in 6.3.4 may be suitable for radiocarbon determination. It must be stated that if a radiocarbon determination is sought from charcoal then the fragment must be identified to species prior to submission to select the shorter lived species to mitigate against the potential 'old wood effect' that may present a radiocarbon age far older than the feature.

7.6.3 Care must be employed for selection as this must also be based on the suitability of the feature, for example, a tertiary pit fill or secondary fill of gully would be unlikely to provide a usable date for the feature.

7.6.4 *Retention and discard:* At this stage all the charcoal should be retained until initial radiocarbon dates have been received at which point a decision on further work or discard can be made. Although further analytical work is recommended on those

assemblages listed in 6.2.2. This should follow methodology laid out in Huntley (2010: 57-60). This would allow for wood and fuel procurement strategies occurring on site to be understood, and once interpolated with data from the wider Wylfa landscape, would provide a larger a corpus from which to determine these practices on a much larger scale.

7.6.5 The magnetic matter from all samples may be discarded prior to archive as it offers no further potential.

Table 6.1: sample information

C	<>	TQ	Cut	Desc	Matrix	PW	PV	SW	SV
5009	5001	4		layer burnt mound	sandy silt	47	28	18437	13000
5009	5002	4		layer burnt mound	sandy silt	50	29	11564	7400
5046	5003	4	5045	fill of trough	sandy silt	49	27	22938	16400
5042	5004	1	5041	posthole	silty clay	8	2	1771	1300
5040	5005	1	5039	posthole	clayey sand	12	6	1242	850

Key: C=context; <>+sample number; TQ=tub quantity; Cut=cut number of feature; Desc=description of feature; Matrix=sediment matrix; PW=processed weight(kg); PV=processed volume(l); SW=sorted weight(g); SV=sorted volume(ml)

Table 6.2: flot and finds from sample data

		Flot			Retent			
C	<>	WF	VF	Ch	Ch	CBM	FC	MM
5009	5001	167.1	300	2.94	43	356	246	12
5009	5002	81.5	100	-	15	415	142	14
5046	5003	43.7	100	0.39	134	1157	-	-
5042	5004	3.5	10	0.11	1	-	26	1
5040	5005	0.8	5	-	2	-	5	1

Key: C=context; <>=sample number; WF=weight of flot(g); VF=volume of flot(ml); Ch=charcoal(g); CBM=ceramic building material(g); Fe=iron(g); FC=fired clay(g); MM=magnetised material(g)

Table 6.3: radiocarbon results

Lab code	***Sample id***	***Context description***	***Material submitted***	***Radiocarbon age BP***	***1σ 68.2%***	***Relative Probability***	***2σ 95.4%***	***Relative Probability***
Beta-554950	A5_(5009)_<5002>	Burnt mound layer	charcoal (rose)	2780±30	980-896 calBC	68.2%	1003-844 calBC-	95.4%
Beta-554951	A5_(5046)_<5003>	Fill of trough [5045]	charcoal (hazel)	2840±30	1042-971 calBC	52%	1090-916 calBC	93.9%
					960-936 calBC	16.2%	1108-1099 calBC	1.5%

8 CONCLUSIONS

8.1 Interpretation

8.1.1 During the archaeological excavation of Area 5 in Field 1, one of multiple targeted areas of investigation in relation to the new nuclear power station site at Wylfa Newydd, Anglesey, an area of 10,086m^2 was excavated. The area was excavated down to the top of the natural substrate.

8.1.2 The purpose of the excavation was to establish the nature and extent of below ground archaeological remains, the located designed to target a possible prehistoric enclosure identified during the previous geophysical survey and interpreted as a field system during the evaluation trial trenching. The trial trench evaluation also encountered burnt deposits, thought to indicate the presence of a burnt mound in the vicinity.

8.1.3 Archaeological remains were identified continuing beyond the previous evaluation trial trenches (TR19 and TR21). The earliest remains were concentrated in the southern half of the area. These appeared to represent contemporary activity in the form of a burnt mound, represent by a burnt deposit overlying two probable troughs, with pits, and post-holes to the east representing a possible associated windbreak.

8.1.4 A field clearance cairn within the northern part, and a boundary ditch and gully, at the eastern and western extents, of the area, likely dated to the post medieval/modern period and were the result of agricultural land improvements. The archaeological remains were seen to demonstrate a simple stratigraphic sequence with all features sealed by the subsoil and truncating the natural substrate. There were no significant intercutting features either discrete or linear in form and very few features had more than one fill.

8.1.5 There was a lack of artefactual material from all contexts which meant that specific dating of the deposits or features identified on this basis was not possible. Two radiocarbon dates – one from the burnt mound spread **(5009)** and a second from a sample taken from the fill **(5046)** of a pit underlying the mound – produced as combined date range of 1108-844 cal. BC, indicating the features date to the Late Bronze Age.

8.1.6 However, the survival of the archaeological features was poor. Survival had been influenced by past ploughing as evident from the ephemeral condition of some of the archaeological features, such as boundary ditch **[5051]**.

8.2 Significance

8.2.1 Where substantive archaeological remains have been recorded, these need to be recognised in their own right - as sites forming part of Wylfa's archaeological landscape, rather than merely being part of its setting. The two main categories of remains within Area 5, the burnt mounds and the field system (including a clearance cairn), also form part of the wider setting of the prehistoric and later remains. Other elements are seen in the nearby fields to the south in Area 7 and Hotspot 10.

8.2.2 There is little potential for the trace of field former system recorded in Area 5 to contribute to the understanding of Anglesey archaeology, due to the undated nature of the remains. Without being able to confirm an independent date then it only has a limited scope to fit into the development of the wider historic landscape.

8.2.3 The remains associated with the burnt mound are of regional significance and can contribute to general published research aims (CIfA Cymru/Wales 2003, 2011, 2017). Although there are no specific research aims related to burnt mounds, the accumulating data is advancing the understanding of the chronology, landscape setting, environmental context and function of such features.

8.2.4 This excavation phase has produced two more very similar radiocarbon dates, both from the one mound and its underlying trough fill of a late Bronze Age date. This is unusual as the majority of the excavated burnt mound sites at Wylfa appear to date to the Late Neolithic/Early Bronze Age. In addition, a recent overview of radiocarbon dates, from 44 burnt mound sites in north-west Wales, established that the majority belong to the period between the Neolithic and Early Bronze Age (Kenney 2012, 266).

8.2.5 There appears to be significant variation between the burnt mounds encountered during the Wylfa Newydd project. The contrasting patterns in the distribution, date, size and forms of burnt mounds suggest that their use and character differed in prehistory. Burnt mounds can be seen as repositories of palaeoenvironmental data. There is particular emphasis on obtaining accurate radiocarbon / C14 dates in order that the chronology of sites and ceramic sequences can ascertained. The soil samples from the features contained quantities of charcoal. This augments their archaeological potential, as there is ‘a general scarcity of environmental data from Anglesey’ (Cuttler et al. 2012, 241) with which to reconstruct ancient farming practices and changes in the landscape. Notably the environmental assessment also identified assemblages of charcoal from the burnt mounds and, with more extensive investigation and sampling, there is potential to identify different fuel sources, uses and even phases within this

large group of features.

8.2.6 Due to the lack of artefactual evidence from Area 5 it is difficult to gain further insights on many aspects that rely on material culture such as social change during the Bronze Age, or later, eras or understanding regional, national and international trade and how the development of social networks fitted into this. The finds assemblage did not provide good dating evidence for the site and is of low archaeological potential.

8.3 Recommendations

8.3.1 The archaeological remains will expand on our understanding of the archaeology of the Isle of Anglesey regarding the regional research framework of Wales (CIfA Cymru/Wales 2017). In order to do this, there is a need to combine the various datasets already produced into a searchable database that can allow the information to be unified and interrogated in a rapid and meaningful manner. This could also assist in producing an accessible resource for digital deposition and public dissemination.

8.3.2 The results of the Area 5 archaeological excavation should be incorporated along with the results of wider Wylfa Newydd scheme and the results disseminated to the interested parties and public. This should be done through deposition of an ordered archive at the suitable repositories for both physical and digital material, the deposition of a detailed report at the Historic Environment Record (HER) and publication.

8.3.3 The excavation of the Late Bronze Age burnt mounds, associated pit/troughs and the recovery of ecofactual material requires full analysis. This will provide fuller dating, characterisation and distribution of burnt mounds which will contribute to research aims on the wider setting of prehistoric sites and exploitation of the natural environment. In particular, the Area 5 burnt mound data should be combined with data from the other burnt mounds excavated as part of the Wylfa Newydd project and will further enhance the recent regional review carried out by Kenney (2012).

8.3.4 A full analysis of the appropriate environmental samples and the plant species present will provide insights into the local farming economy and the wider exploitation of the natural environment. This will be particularly focused on the Late Bronze Age since the secure data relates to that era. This would include submitting any further material suitable for radiocarbon dating to produce a better understanding of the dating, particularly through the use of Bayesian statistics (Whittle, Bayliss and Healy 2011).

8.3.5 The extremely small finds assemblages warrants no further work other than that the

lithics should be considered alongside other areas with the wider project.

8.3.6 The Industrial era land improvements are of little value in of themselves, however analysis of these in their relation to Industrial agricultural practices across the entire development area would be beneficial to the archaeological record and contribute to the research framework priority of mapping landscape change in this period (CIfA Cymru/Wales 2017).

9 BIBLIOGRAPHY

Andrefsky, Jr, W. 2005. *Lithics: Macroscopic approaches to analysis*. Cambridge Manual in Archaeology, 2nd edition. Cambridge University Press.

Ballin, T.B. 2000. Classification and Description of Lithic Artefacts. A discussion of the basic lithic terminology. *Lithics* **21**: 9-15

Beta Radiocarbon Dating, Introduction to Radiocarbon Determinations by the Accelerator Mass Spectrometry Method, (PDF from Beta Analytic 2020)

BGS 2019. *British Geological Survey Geology of Britain Viewer*. Available: http://mapapps.bgs.ac.uk/geologyofbritain/home.html [Accessed 28th November 2019]

Bronk Ramsey. C. 2009. Bayesian Analysis of Radiocarbon Dates. In *Radiocarbon* **51 (1)**: 337-60

Brown, D.H. 2011. *Archaeological Archives: A Guide to Best Practice in Creation, Compilation, Transfer and Curation,* Archaeological Archives Forum.

Butler, C. 2005. *Prehistoric flintwork*. Stroud. Tempus.

Campbell, G, Moffett, L and Straker, V 2011. *Environmental Archaeology. A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (second edition)*, English Heritage, Portsmouth

Carr, A. D., 1972 'The extent of Anglesey 1352'. *Trans. Anglesey Antiquarian Society,* 1971-2, 150-72

CIfA 2014a. *Standard and guidance for archaeological excavation*. Chartered Institute for Archaeologists, Reading.

CIfA 2014b. *Standard and guidance for the collection, documentation, conservation and research of archaeological materials*. Chartered Institute for Archaeologists, Reading.

CIfA Cymru/Wales 2017. A *Research Framework for the Archaeology of Wales Version 03, final refresh 2016.* Available at: https://www.archaeoleg.org.uk/documents.html [Accessed 28th November 2019].

Cooke, R., Davidson, J. and Hopewell, D. 2012. *Proposed Nuclear Power Station Wylfa, Ynys Môn: Archaeological Baseline Assessment Report*. GAT report 999.

Cuttler, R., Davidson, A and Hughes, G. 2012. *A Corridor Through Time: the Archaeology of the A55 Anglesey Road Scheme*. Oxford. Oxbow Books

Department for Energy and Climate Change, 2011. *Overarching Policy Statement for Energy (EN-1)*. The Stationary Office: London

Europae Archaeologia Consilium (EAC) 2014. *A Standard and Guide to Best Practice for Archaeological Archiving in Europe,* EAC Guidelines 1: Belgium.

GAT 2012a: Hopewell, D. (2012) 'Proposed Nuclear Power Station Wylfa, Anglesey, Archaeological Evaluation: Geophysical Survey, Interim Report'. Gwynedd Archaeological Trust, Unpublished client report 1019.

GAT 2012b: Cooke, R., Davidson, J. and Hopewell, D. (2012) 'Proposed Nuclear Power Station Wylfa, Ynys Mon Archaeological Baseline Assessment Report 1.0'. Gwynedd Archaeological Trust, Unpublished client report 999.

Gwynedd Archaeological Trust (GAT) nd. *Early Medieval Burial in Gwynedd*. GAT Report No. 350. Unpublished report.

Hather, J.G., 2000. *The Identification of the Northern European Woods: A Guide for Archaeologists and Conservators.* Archetype, London

Headland 2017. *Wylfa Newydd Proposed New Nuclear Power Station: Archaeological Trial Trenching Post-Excavation Assessment and Updated Project Design. Unpublished report ref. WNBA/01*

Historic England 2019. *Animal Bones and Archaeology: recovery to archive*. Swindon: Historic England Handbooks for Archaeology.

HNP 2015. *Wylfa Newydd Proposed New Nuclear Power Station: Written Scheme of Investigation for Archaeological Trial Trenching and Excavation*. Unpublished report reference WN03.03.01-S5-PAC-MES-00001

HNP 2017a. *Technical update to the Written Scheme of Investigation for Archaeological Trial Trenching and Excavation: Investigation of ring ditch site (fields L8/L12/L16)*. Unpublished report.

HNP 2017b. *Community Dig Outline Procedures 01/08/2017*. Unpublished report.

Hopewell, D, 2011a. *Preliminary outline interpretation of potential archaeological magnetic gradient anomalies in Phase 1 area, Wylfa*. Unpublished GAT report 936

Hopewell, D, 2011b. *Proposed Nuclear Power Station, Wylfa, Ynys Mon. Archaeological Evaluation: Targeted Geophysics.* Unpublished GAT report 987

Hopewell, D, 2012. *Proposed Nuclear Power Station, Wylfa, Ynys Mon. Archaeological*

Evaluation: Geophysical Survey, Interim report. Unpublished GAT report 1019

Hounsell, D. (2017) 'Technical Update to the Written Scheme of Investigation for Archaeological Trial Trenching and Excavation: Investigation area in field A1'. Horizon Nuclear Power.

Huntley, J. 2010. *A Review of Wood and Charcoal Recovered from Archaeological Excavations in Northern England*, Research Department Report Series no 68-2010

Jacobs 2018. *Wylfa Newydd Proposed New Nuclear Power Station Cultural Heritage Baseline Report (Part* 1/2), 6.4.68 ES Volume D - WNDA Development App D11-1

Licence T. 2015. *What the Victorians Threw Away.* Oxbow Books.

McComish, J.M. 2015. *A Guide to Ceramic Building Materials* York Archaeological Trust: Web Based Report

MOLA 2015. *Medieval and Post-medieval Pottery Codes.* Museum of London Archaeology: https://www.mola.org.uk/medieval-and-post-medieval-pottery-codes [Accessed on 20 January 2020].

National Research Framework for Wales 2020: https://www.archaeoleg.org.uk/ [Accessed on 20 January 2020]

PCRG, SGRP, MPRG 2016. *A Standard for Pottery Studies in Archaeology.* Medieval Pottery Research Group.

Reimer. P.J., Bard.E., Bayliss. A., Beck. J.W., Blackwell. P.G., Bronk Ramsey. C., Buck. C.E., Cheng. H., Edwards. R.L., Friedrich. M., Grootes. P.M., Guilderson. T.P., Haflidason. H., Hajdas. I., Hatte. C., Heaton. T.J., Hogg. A.G., Hughen. K.A., Kaiser. K.F., Kromer. B., Manning. S.W., Niu. M., Reimer. R.W., Richards. D.A., Scott. E.M., Southon. J.R., Turney. C.S.M., van der Plicht. J. 2013. Intcal13 and MARINE13 radiocarbon age calibration curves 0-50000 years calBP, *Radiocarbon* **55** (4): 1869-1887

Schweingruber, F.H., 1982. *Microscopic Wood Anatomy* (2nd Ed), Swiss Federal Institute of Forestry Research, Zurich

Stace C., 2010. *New Flora of the British Isles (3rd Ed.)*, C.U.P., Cambridge

Wardell Armstrong 2018. *Environmental Archaeology*, Wardell Armstrong LLP Technical Manual No. 2, version 3

Wardell Armstrong 2019. *Horizon, Wylfa Newydd, Post excavation assessment method statement*, unpublished report

Watkinson, D.E. & Neal, V. 1998. *First Aid for Finds*. RESCUE, The British Archaeological Trust: London.

Wessex Archaeology nd. *Guidelines for Environmental Sampling*. Unpublished internal document

Wessex Archaeology 2015. *Fieldwork Recording Manual*. Unpublished internal document

Wessex Archaeology 2016. *Wylfa Newydd, Isle of Anglesey Archaeological Trial Trenching*, Ref 11940.59 v4.0

Williams, D, 1973. '*Flotation at Siraf*', *Antiquity*, 47: 198-202

APPENDICES

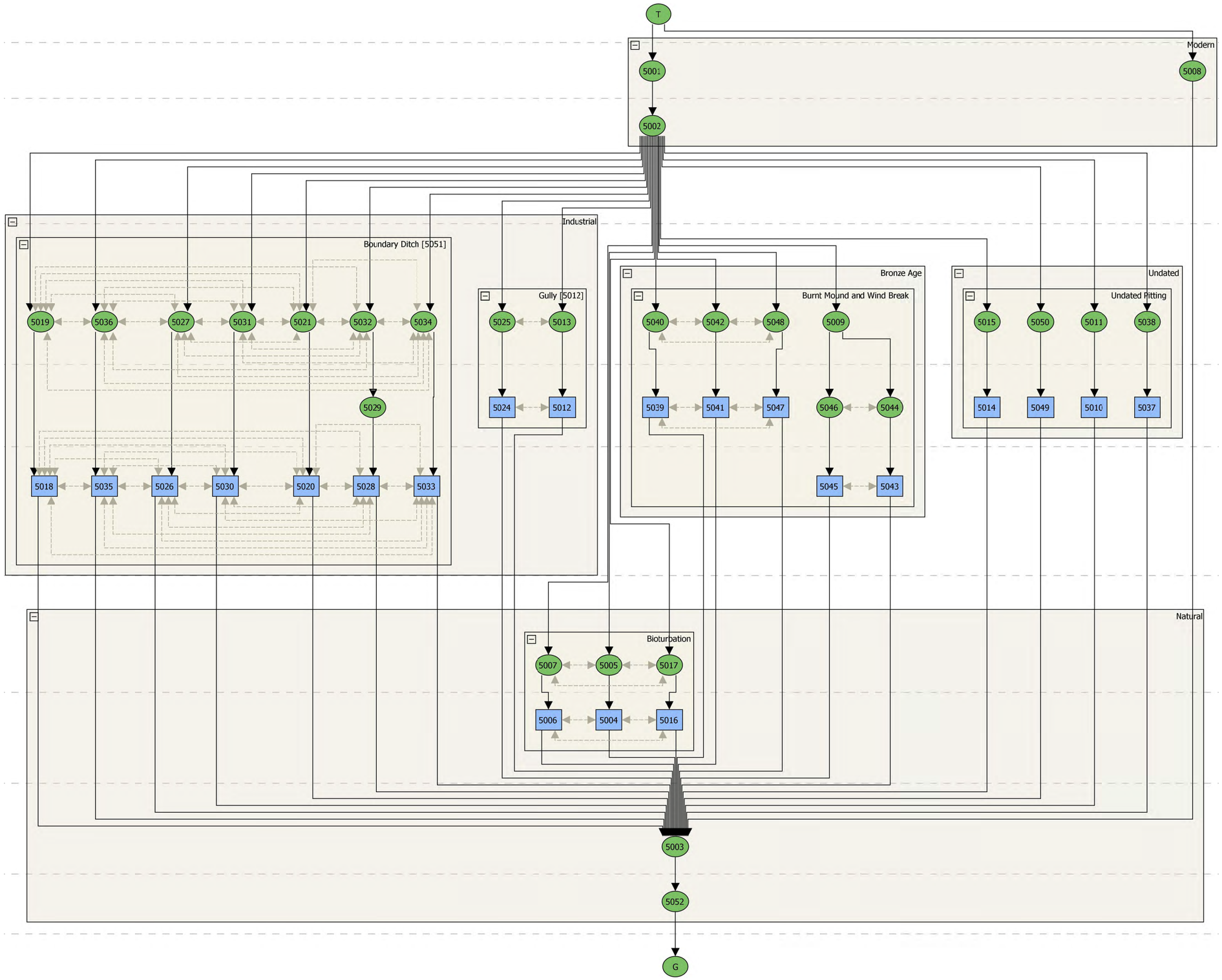
APPENDIX 1: CONTEXT INDEX

Context Number	Context Type	Description	Height/Depth	Discussion
5001	Layer	Mid brown silty, clay	0.10-0.45 m thick	Topsoil
5002	Layer	Mid orangey-brown, sandy silt	0.08-0.58 m thick	Subsoil
5003	Layer	Mid orangey-brown, sandy clay	0.29-0.80 m BGL	Natural substrate
5004	Cut	Oval cut with irregular sides and flat base	1.20 m long, 0.88 m wide, 0.18 m deep	Cut of bioturbation
5005	Fill	Dark brown, sandy clay loam with 5% angular cobbles and 3% charcoal flecking - Single fill of bioturbation [5004]	0.18 m thick	Single fill of bioturbation [5004]
5006	Cut	Oval cut with irregular sides and flat base	0.60m long, 0.67m wide, 0.17m deep	Cut of bioturbation
5007	Fill	Dark brown, sandy clay loam with 3% charcoal flecking	0.17m thick	Single fill of bioturbation [5006]
5008	Structure	Sub-circular structure comprising mostly sub-angular pebbles, cobbles and boulders	6.00m long, 5.40m wide	Field clearance cairn
5009	Layer	Dark brown with orange mottling, sandy clay with large sub-rounded and sub-angular heat affected stones and charcoal flecks	5.00m long, 4.35m wide	Burnt mound
5010	Cut	Oval cut with shallow concave sides and concave base	0.60m long, 0.50m wide, 0.12m deep	Cut of pit
5011	Fill	Mid yellowish-brown silty sand	0.12m thick	Single fill of pit [5010]
5012	Cut	Curvilinear cut running E-W with moderate concave sides andconcave base	2.00m long, 0.55m wide, 0.25m deep	Cut of shallow gully
5013	Fill	Loose, light reddish-grey, sandy clay with 30% large angular boulders and 5% charcoal fleckin]	0.25m thick	Single fill of gully [5012]
5014	Cut	Sub-oval cut with shallow concave sides and irregular base	1.73m long, 1.10m wide, 0.21m deep	Cut of pit
5015	Fill	Dark brown, sandy silt	0.21m thick	Single fill of pit [5014]
5016	Cut	Sub-circular cut with shallow to moderate concave sides and irregular base	0.78m long, 1.13m wide, 0.07m deep	Cut of bioturbation
5017	Fill	Dark brown, sandy clay loam with 5% charcoal - Single fill of bioturbation [5016]	0.07m deep	Single fill of bioturbation [5016]
5018	Cut	Linear cut NW-SE orientated with moderate concave sides and flat base	1.00m long, 1.20m wide, 0.19m deep	Cut of ditch (Part of [5051])
5019	Fill	Light yellowish-brown, sandy silt with sparse sub-rounded and sub-angular stones	0.19m thick	Single fill of [5018]

Context Number	Context Type	Description	Height/Depth	Discussion
5020	Cut	Linear cut NW-SE orientated with shallow concave sides and irregular base	1.20m long, 0.68m wide, 0.05m deep	Cut of ditch terminus (Part of [5051])
5021	Fill	Light greyish brown, silty clay loam with rare gravels	0.05m thick	Single fill of ditch [5020]
5022	VOID	VOID	VOID	VOID
5023	VOID	VOID	VOID	VOID
5024	Cut	Curvilinear cut running E-W with steep concave sides and irregular base	2.00m long, 0.56m wide,	Possible terminal cut of [5012]
5025	Fill	Dark brownish-grey, sandy clay with 1% coarse gravels and 5% charcoal flecking	0.28m thick	Secondary fill of gully [5024]
5026	Cut	Linear cut running NW-SE with moderate concave sides and rounded base	1.00m long, 0.70m wide, 0.08m deep	Cut of ditch (Part of [5051])
5027	Fill	Light greyish-brown, sandy silt with sparse sub-rounded and sub-angular pebbles, and chert fragments	0.08m thick	Tertiary fill of ditch [5026]
5028	Cut	Linear cut running NW-SE with moderate concave sides and flat base	1.00m long, 0.90m wide, 0.20m deep	Cut of ditch (Part of [5051])
5029	Fill	Dark orange, sandy silt with rare small sub-angular stones	0.07m thick	Primary fill of ditch [5028}
5030	Cut	Linear cut running NW-SE with shallow concave sides and irregular base	1.00m long, 2.30m wide, 0.18m deep	Cut of ditch (Part of [5051])
5031	Fill	Dark brown, sandy loam with shale slate	0.18m thick	Single fill of ditch [5030] (Same as (5031) & (5034))
5032	Fill	Dark brown, sandy silt with rare small to medium sub-rounded and sub-angular stones	0.20m thick	Upper fill of ditch [5028] (Same as (5031) & (5034))
5033	Cut	Linear cut running NW-SE with moderate concave sides and concave base	1.00m long, 0.93m wide, 0.24m deep	Cut of ditch (Part of [5051])
5034	Fill	Dark brown, sandy silt with rare small to medium sub-rounded and sub-angular stones	0.24m thick	Single fill of ditch [5033] (Same as (5031) & (5034))
5035	Cut	Linear cut running NW-SE with shallow convex sides and irregular base	1.32m long, 1.35m wide, 0.19m deep	Cut of ditch (Part of [5051])
5036	Fill	Mid greyish-brown, sandy loam with sparse fine and medium gravels	0.19m thick	Single fill of ditch [5035]
5037	Cut	Sub-rectangular cut with shallow vertical straight sides and flat base	0.57m long, 0.29m wide, 0.13m deep	Cut of post-hole / pit

Context Number	Context Type	Description	Height/Depth	Discussion
5038	Fill	Mid dark brown silty loam	0.13m thick	Single fill of post-hole / pit [5037]
5039	Cut	Circular cut with steep straight sides and U-shaped base	0.26m diameter, 0.22m deep	Cut of post-hole
5040	Fill	Light greyish brown, sandy silt loam with abundant well sorted rounded to sub-angular sand-cobbles	0.22m thick	Single fill of post-hole [5039]
5041	Cut	Sub-circular cut N-S orientated with moderate concave sides and flat base	0.43m long, 0.40m wide, 0.17m deep	Cut of post-hole
5042	Fill	Dark brown, silty sand with large sub-angular packing stones	0.17m thick	Fill of post-hole [5041]
5043	Cut	Sub-oval cut E-W orientated with moderate concave sides and flat base	3.95m long, 2.23m wide, 0.77m deep	Cut of bioturbation
5044	Fill	Dark brown mottled with orange, sandy clay with large sub-rounded and sub-angular stones, medium heat affected stones, and charcoal flecks	0.77m thick	Single fill of bioturbation [5043]
5045	Cut	Sub-rectangular cut with vertical straight sides and flat base	2.40m long, 1.35m wide, 0.43m deep	Cut of trough
5046	Fill	Heat affected stones with 20% dark black brown, silty sand, rooting, and rare charcoal flecks	0.43m thick	Single fill of trough [5045]
5047	Cut	Oval cut with shalllow concave sides and concave base	0.50m long, 1.20m wide, 0.12m deep	Cut of pit
5048	Fill	Greyish-brown, silty sand with rare rounded stones	0.12m thick	Single fill of pit [5047]
5049	Cut	Oval cut E-W orientated with moderate convex sides and flat base	1.38m long, 0.84m wide, 0.10m deep	Cut of post-hole / pit
5050	Fill	Firm, dark brownish-grey, sandy clay with 5% angular to rounded coarse gravels	0.10m thick	Secondary fill of post-hole / pit [5049]
5051	Group	Group for Linear ditch running NW-SE comprising: [5018], [5020], [5026], [5028], [5030], [5033]	50m long, 1.35m wide, 0.19m deep	Boundary ditch
5052	Layer	Schist bedrock	-	Natural geological substrate

APPENDIX 2: HARRIS MATRIX


T
Modern
5001
5008
5002
Industrial
Boundary Ditch [5051]
5019
5036
5027
5031
5021
5032
5034
5029
5018
5035
5026
5030
5020
5028
5033
Gully [5012]
5025
5013
5024
5012
Bronze Age
Burnt Mound and Wind Break
5040
5042
5048
5009
5039
5041
5047
5046
5044
5045
5043
Undated
Undated Pitting
5015
5050
5011
5038
5014
5049
5010
5037
Natural
Bioturbation
5007
5005
5017
5006
5004
5016
5003
5052
G

APPENDIX 3: PLATES

Plate 1; North facing section of pit [5043], facing south with 1m scale.

Plate 2; North facing section of pit [5045], facing south with 2m scale.

Plate 3; South facing section of burnt mound (5009), facing north with 2m scale.

Plate 4; South facing section of pit [5049], facing north with 1m scale.

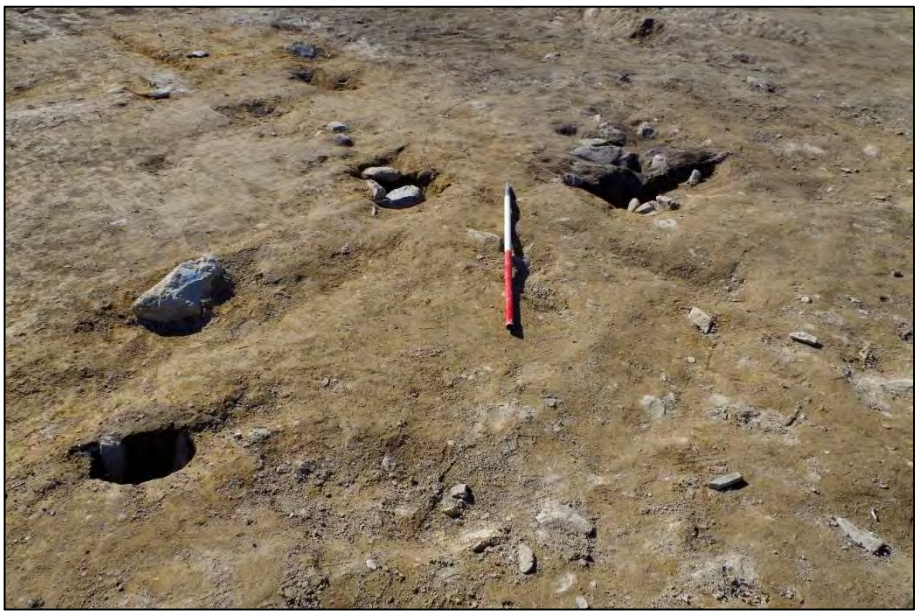


Plate 5; Plan of post-holes / pits [5037], [5039], [5041], and [5047], facing southwest with 1m scale.

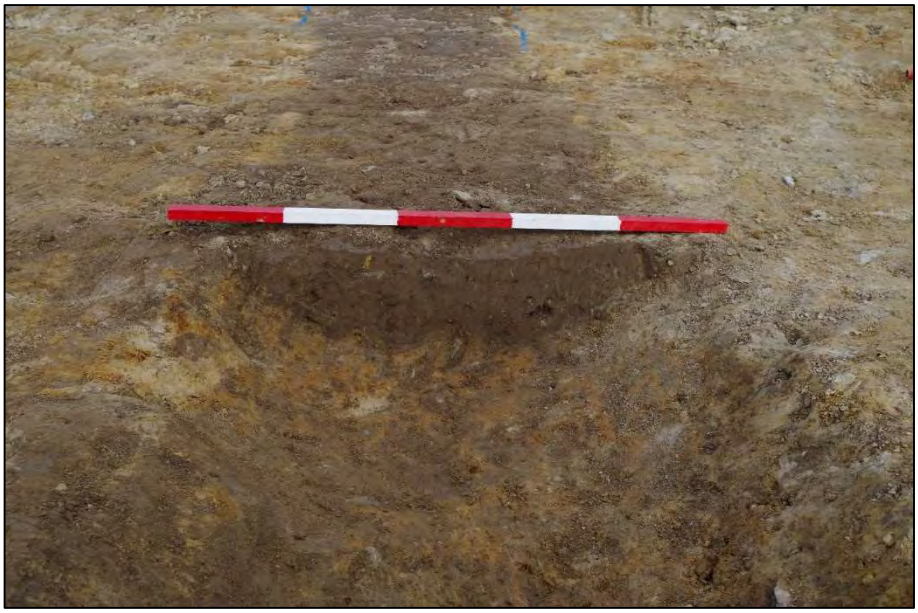


Plate 6; Southeast facing section of intervention [5033] of ditch [5051], facing northwest with 1m scale.

Plate 7; Northwest facing section of intervention [5028] of ditch [5051], facing southeast with 1m scale.

Plate 8; East facing section of gully [5012], facing west with 1m scale.

Plate 9; Northwest facing section [5014], facing southeast with 1m scale.

Plate 10; Shot of clearance cairn {5008}, facing northwest with 2m and 1m scales.

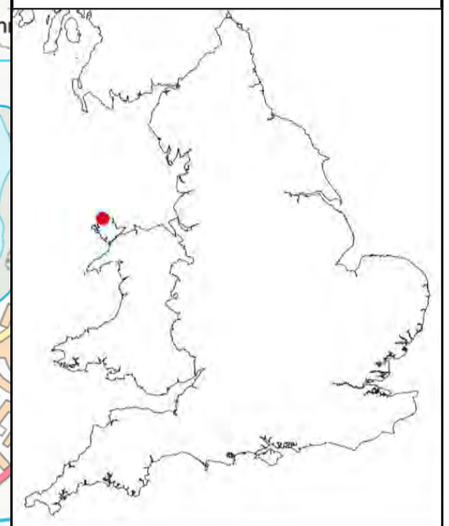
APPENDIX 4: FIGURES

DO NOT SCALE FROM THIS DRAWING

Wylfa Newydd development area

Excavation area

Hot spots



Mynydd y Wylfa
Cemaes Bay
Cemlyn Bay
Cerrig Brith
Porth-y-Pistyll
Porth y Wylfa
Wylfa Head
Penrhyn
Fford Y Traeth
Cemaes
High Street
Tormar Cottage
Felin Gafnan
Maen Y Bugail
Tyddyn-Goronwy
Tyddyn Sydney
Swn Y Mor
Cafnan
Tregele
EV9
Fford Y Felin
Cemlyn Lodge
Caerdegog Isaf
Mynydd-Lthel
Nanner
234000/392000
Foel Fawr
Gors
237000/392000
Cromlech
Caerdegog Uchaf
Groes-Fechan
Tyn Cae
The Bungalow

Area 9 (F1)
Area 11 L1(w)
Area 12 L1(c)
Area 13 L1(e)
Area 14 (L1/L20)
Area 1 (L3/L4)
Area 17 (L2)
Area 16 (K2)
Area 2 (L8/L12/L16)
Area 3 (K11)
Area 5 (A1)
Area 4 (E3)
Area 7 (A3)
Area 8 (A9)
Area 18 O6
Area 19 O5(n)
Area 20 O5(s)

10 13 11 12 8 15 7 9 6 14 5 16 17

N

0 1km

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D

CLIENT

Horizon Nuclear Power

PROJECT

Area 5,
Wylfa Newydd, Anglesey

DRAWING TITLE

Figure 1:
Wylfa Newydd development area and excavated sites

DRG No.	REV
CL12283-501	A

DRG SIZE	SCALE	DATE
A3	1:12,500	Feb 2020

DRAWN BY	CHECKED BY	APPROVED BY
HP	DAC	FG

wardell armstrong
CARLISLE | TEL 01228 550 575
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM LEEDS
BOLTON LONDON
CARDIFF MANCHESTER
EDINBURGH N-U-T
GLASGOW STOKE ON TRENT

N:\CP\CL12283 - WYLFA POSTEX ASSESSMENT\03 - DESIGN\AUTOCAD\AREA 5\CL12283-501-A.DWG

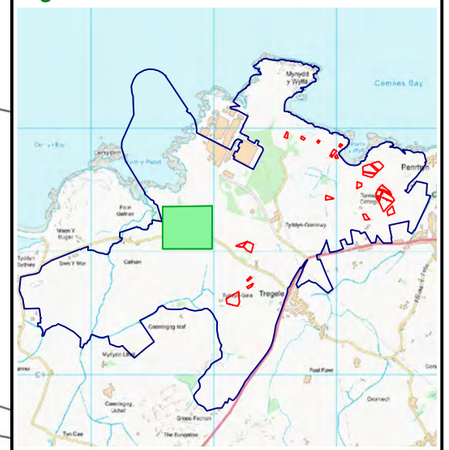
DO NOT SCALE FROM THIS DRAWING

Wylfa Newydd development area

Excavation area

Excavation areas in vicinity

Figure location:



Area 5 (A1)

Track

FW

Well

Pond

20.4m

27.1m

27.2m

20.4m

20.4m

21.0m

234650/393100

234900/393100

0

100m

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D

CLIENT

Horizon Nuclear Power

PROJECT

Area 5,
Wylfa Newydd, Anglesey

DRAWING TITLE

Figure 2:
Detailed site location

DRG No.	REV
CL12283-502	A

DRG SIZE	SCALE	DATE
A3	1:1,250	Jan 2020

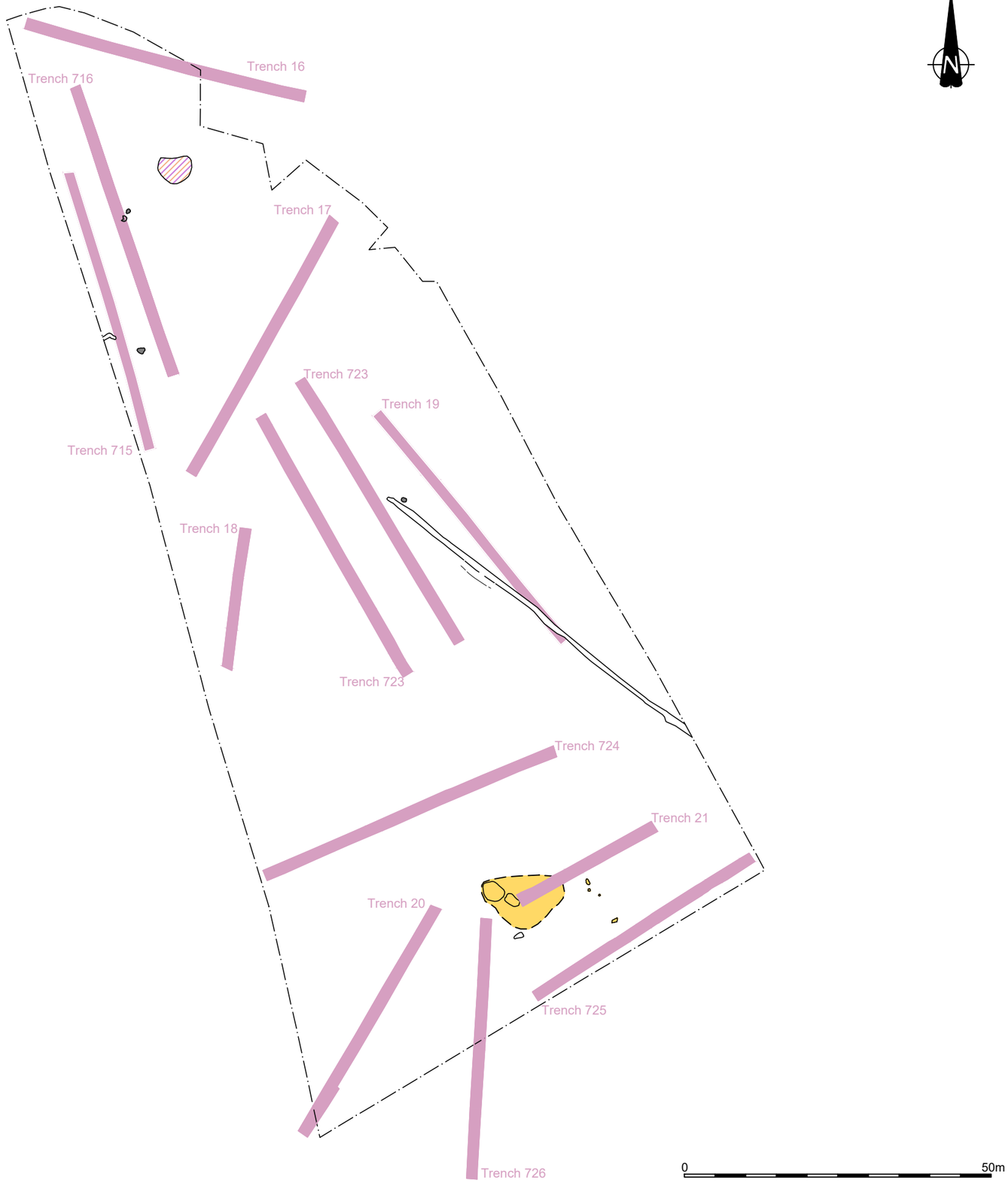
DRAWN BY	CHECKED BY	APPROVED BY
HP	CA	FG

wardell armstrong

CARLISLE | TEL 01228 550 575
WWW.WARDELL-ARMSTRONG.COM

BIRMINGHAM, BOLTON, CARDIFF, EDINBURGH, GLASGOW, LEEDS, LONDON, MANCHESTER, N-U-T, STOKE ON TRENT

N:\CP\CL12283 - WYLFA POSTEX ASSESSMENT\03 - DESIGN\AUTOCAD\AREA 5\CL12283-502-A.DWG



DO NOT SCALE FROM THIS DRAWING

- Limit of excavation
- Trench location
- Period 0 Natural
- Period 3 Late Bronze Age and Iron Age 1500 BC – AD 43
- Period 7 Post-medieval AD 1539 - 1750 - Period 8 Industrial and Modern AD 1750 - present
- Undated

REVISION	DETAILS	DATE	DR'N	CH'K'D	APP'D
B	Additions and corrections	05/05/21	HP	MH	MH

CLIENT

Horizon Nuclear Power

PROJECT

Area 5,
Wylfa Newydd,
Anglesey

DRAWING TITLE

Figure 3:
Area 5; Period plan

DRG No.	REV
CL12283-503	B

DRG SIZE	SCALE	DATE
A3	1:750	Nov 2020

DRAWN BY	CHECKED BY	APPROVED BY
HP	CA	FG

wardell armstrong

CARLISLE | TEL 01228 550 575
WWW.WARDELL-ARMSTRONG.COM

BIRMINGHAM, BOLTON, CARDIFF, EDINBRUGH, GLASGOW, LEEDS, LONDON, MANCHESTER, NEWCASTLE UPON TYNE, STOKE ON TRENT

N:\CP\CL12283 - WYLFA POSTEX ASSESSMENT\03 - DESIGN\AUTOCAD\AREA 5\CL12283-503-B.DWG

(5008)
s.5002
[5006]
s.5001
[5004]
s.5000
[5012]
s.5004
[5024]
s.5010
[5016]
s.5006
natural (5003)
s.5008A
[5020]
s.5003
[5010]
s.5008B
Group [5051]
s.5007A
s.5007B
[5018]
0
20m
N

DO NOT SCALE FROM THIS DRAWING

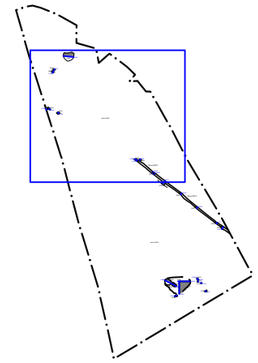
(5000) Context numbers

Section location

Limit of excavation

Excavated area

Figure location:



REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
B	Additions and corrections	05/05/21	HP	MH	FG

CLIENT

Horizon Nuclear Power

PROJECT

Area 5,
Wylfa Newydd,
Anglesey

DRAWING TITLE

Figure 4:
Area 5; detailed plan (north)

DRG No.	REV
CL12283-504	B

DRG SIZE	SCALE	DATE
A3	1:250	Jan 2020

DRAWN BY	CHECKED BY	APPROVED BY
HP	CA	FG

wardell armstrong
CARLISLE | TEL 01228 550 575
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM LEEDS
BOLTON LONDON
CARDIFF MANCHESTER
EDINBURGH N-U-T
GLASGOW STOKE ON TRENT

N:\CP\CL12283 - WYLFA POSTEX ASSESSMENT\03 - DESIGN\AUTOCAD\AREA 5\CL12283-504-505-B.DWG

DO NOT SCALE FROM THIS DRAWING

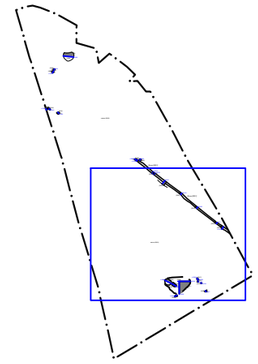
s.5007A
s.5007B
[5018]
s.5013
[5030]
s.5012A
[5028]
Group [5051]
s.5012B
[5033]
s.5011
[5026]
[5035]
s.5013C
natural (5003)

s.5022
[5043]
(5009)
s.5016A
s.5020A
[5047]
s.5020B
[5041]
s.5019A
[5039]
s.5018A
[5045]
s.5023
[5037]
s.5017
s.5016B
s.5021
[5049]

0
20m

(5000) Context numbers
Section location
Limit of excavation
Excavated area
Extent of burnt mound

Figure location:



REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
B	Addition of section details on (5009)	04/05/21	HP	MH	FG

CLIENT
Horizon Nuclear Power

PROJECT
Area 5,
Wylfa Newydd,
Anglesey

DRAWING TITLE
Figure 5:
Area 5; detailed plan (south)

DRG No.	REV
CL12283-505	B

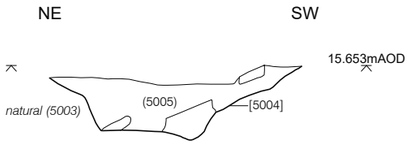
DRG SIZE	SCALE	DATE
A3	1:250	Nov 2020

DRAWN BY	CHECKED BY	APPROVED BY
HP	CA	FG

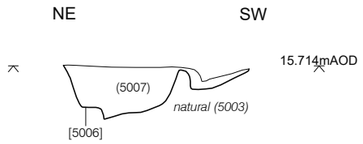
wardell armstrong
CARLISLE | TEL 01228 550 575
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM LEEDS
BOLTON LONDON
CARDIFF MANCHESTER
EDINBURGH N-U-T
GLASGOW STOKE ON TRENT

N:\CP\CL12283 - WYLFA POSTEX ASSESSMENT\03 - DESIGN\AUTOCAD\AREA 5\CL12283-504-505-B.DWG

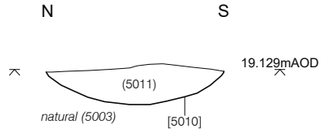
Phase 1 sections:



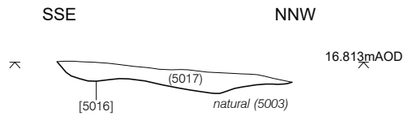
Section 5000. North-west facing section across natural feature [5004].



Section 5001. North-west facing section across natural feature [5006].

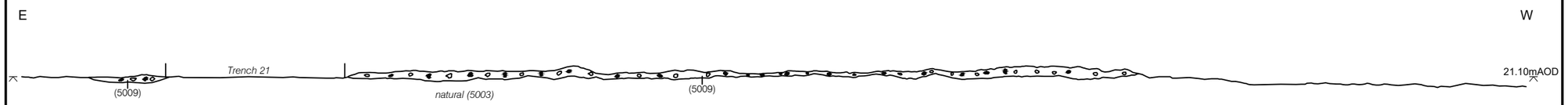


Section 5003. West facing section across pit [5010].

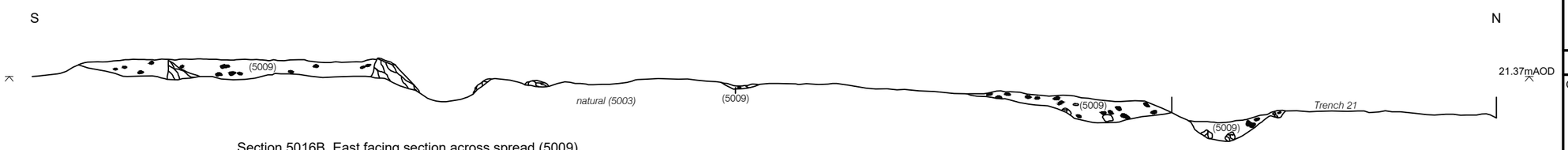


Section 5006. ENE facing section across natural feature [5016].

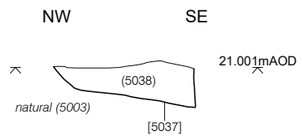
Phase 2 sections:



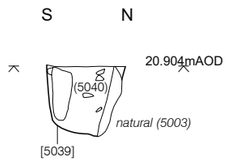
Section 5016A. South facing section across spread (5009).



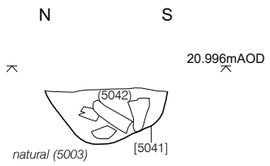
Section 5016B. East facing section across spread (5009).



Section 5017. South-west facing section across feature [5037].



Section 5018A. East facing section across post-hole [5039].



Section 5019A. West facing section across post-hole [5041].

Section 5020A. East facing section across pit [5047].

0 2m

DO NOT SCALE FROM THIS DRAWING

(5000) Context numbers

Limit of excavation

Height mAOD

Stones

Burnt stone

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
B	Aditional sections	05/05/21	HP	MH	FG

CLIENT

Horizon Nuclear Power

PROJECT

Area 5,
Wylfa Newydd,
Anglesey

DRAWING TITLE

Figure 6:
Area 5; sections (1)

DRG No.	REV
CL12283-506	B

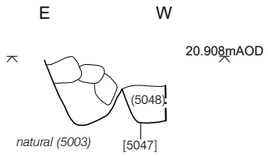
DRG SIZE	SCALE	DATE
A3	1:20	Jan 2020

DRAWN BY	CHECKED BY	APPROVED BY
HP	CA	FG

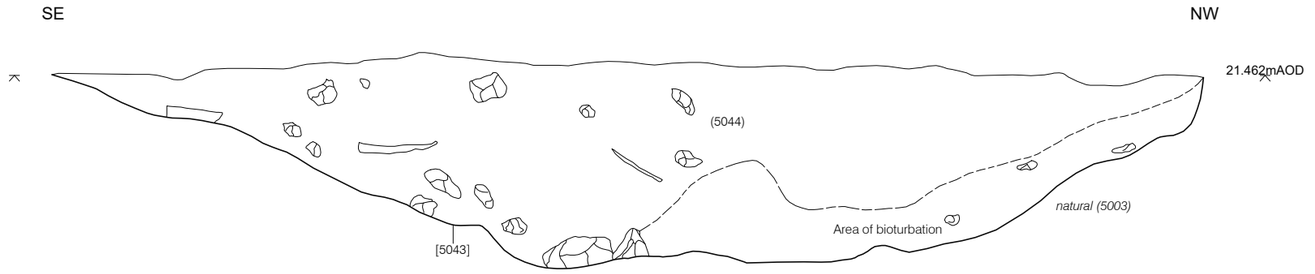
wardell armstrong
CARLISLE | TEL 01228 550 575
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM LEEDS
BOLTON LONDON
CARDIFF MANCHESTER
EDINBURGH N-U-T
GLASGOW STOKE ON TRENT

N:\CP\CL12283 - WYLFA POSTEX ASSESSMENT\03 - DESIGN\AUTOCAD\AREA 5\CL12283-506-508-B.DWG

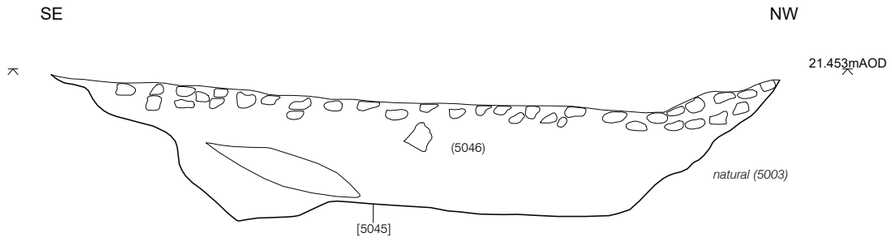
Phase 2 sections (continued):



Section 5020B. North facing section across pit [5047] and post-hole.

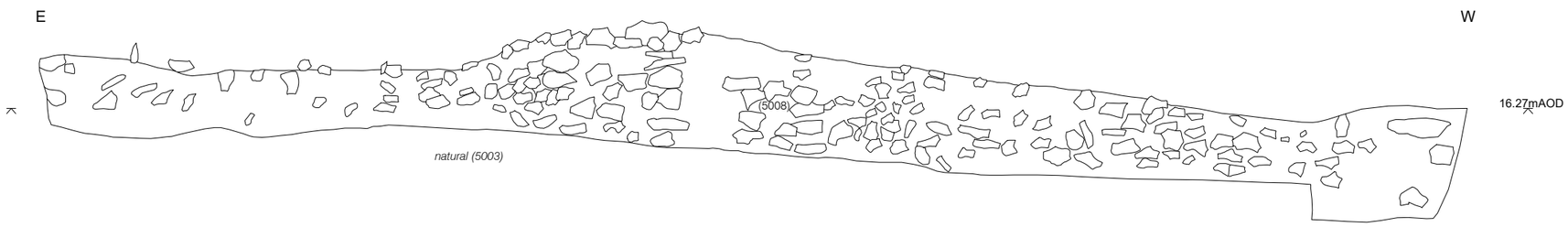


Section 5022. North-east facing section across feature [5043].



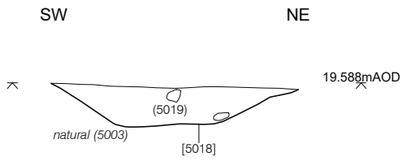
Section 5023. North-east facing section across feature [5045].

Phase 3 sections:

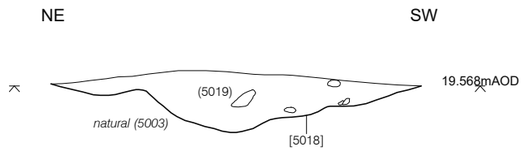


Section 5002. North facing section across field clearance cairn (5008).

Undated sections:



Section 5007A. South-east facing section across cut [5018], part of group [5051].



Section 5007B. North-west facing section across cut [5018], part of group [5051].

0 2m

DO NOT SCALE FROM THIS DRAWING

(5000) Context numbers

Limit of excavation

Height mAOD

Stones

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
B	Aditional sections	05/05/21	HP	MH	FG

CLIENT

Horizon Nuclear Power

PROJECT

Area 5,
Wylfa Newydd,
Anglesey

DRAWING TITLE

Figure 7:
Area 5; sections (2)

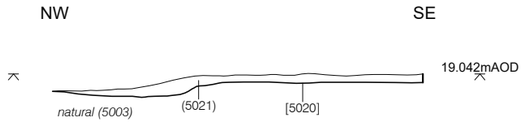
DRG No.	REV
CL12283-507	B

DRG SIZE	SCALE	DATE
A3	1:20	Jan 2020

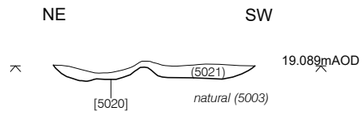
DRAWN BY	CHECKED BY	APPROVED BY
HP	CA	FG

wardell armstrong
CARLISLE | TEL 01228 550 575
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM LEEDS
BOLTON LONDON
CARDIFF MANCHESTER
EDINBURGH N-U-T
GLASGOW STOKE ON TRENT

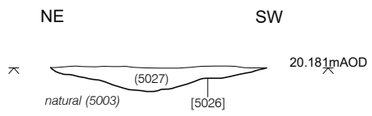
Undated sections (continued):



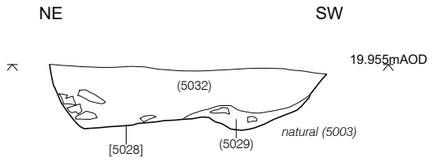
Section 5008A. South-west facing profile across ditch terminus [5020], part of group [5051].



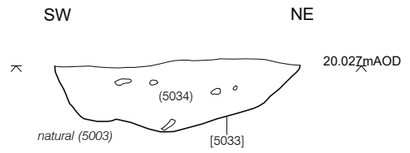
Section 5008B. North-west facing section across cut [5020], part of group [5051].



Section 5011. North-west facing section across cut [5026], part of group [5051].

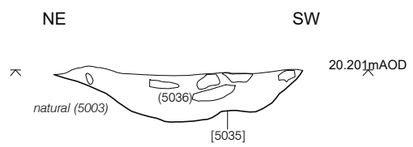


Section 5012A. North-west facing section across cut [5028], part of group [5051].

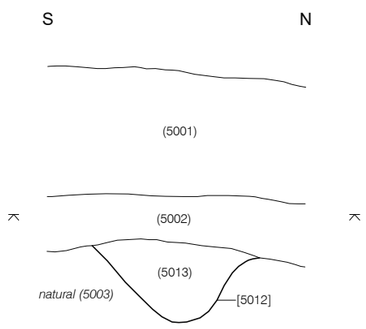


Section 5012B. South-east facing section across cut [5033], part of group [5051].

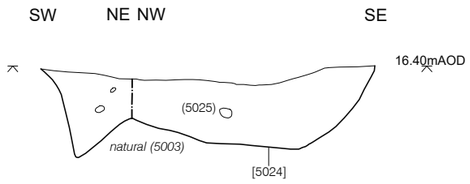
Section 5013. South-east facing section across cut [5030], part of group [5051].



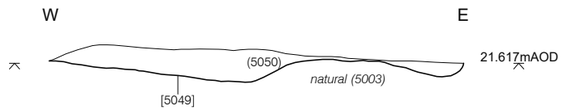
Section 5013C. North-west facing section across cut [5035], part of group [5051].



Section 5004. East facing section across gully [5012].



Section 5010. SE-SW facing section across ditch terminus [5024].



Section 5021. South facing section across pit [5049].

0 2m

DO NOT SCALE FROM THIS DRAWING

(5000) Context numbers

Limit of excavation

Height mAOD

Stones

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
B	Aditional sections	05/05/21	HP	MH	FG

CLIENT

Horizon Nuclear Power

PROJECT

Area 5,
Wylfa Newydd,
Anglesey

DRAWING TITLE

Figure 8:
Area 5; sections (3)

DRG No.	REV
CL12283-508	B

DRG SIZE	SCALE	DATE
A3	1:20	Jan 2020

DRAWN BY	CHECKED BY	APPROVED BY
HP	CA	FG

wardell armstrong
CARLISLE | TEL 01228 550 575
WWW.WARDELL-ARMSTRONG.COM
BIRMINGHAM LEEDS
BOLTON LONDON
CARDIFF MANCHESTER
EDINBURGH N-U-T
GLASGOW STOKE ON TRENT

APPENDIX 5: RADIOCARBON CERTIFICATES

BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

(High Probability Density Range Method (HPD): INTCAL13)

(Variables: d13C = -26.2 o/oo)

Laboratory number Beta-554950

Conventional radiocarbon age 2780 ± 30 BP

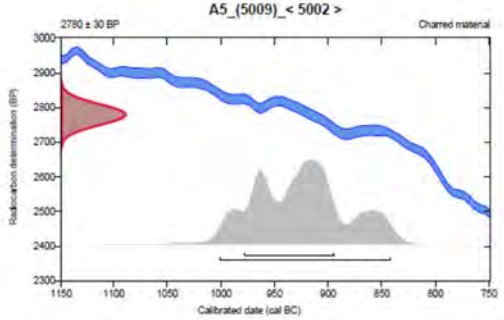
95.4% probability

(95.4%) 1003 - 844 cal BC (2952 - 2793 cal BP)

68.2% probability

(68.2%) 980 - 896 cal BC (2929 - 2845 cal BP)

A5_(5009)_< 5002 >



Database used
INTCAL13

References
References to Probability Method
Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.
References to Database INTCAL13
Reimer, et.al., 2013, Radiocarbon55(4).

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • Email: beta@radiocarbon.com

BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

(High Probability Density Range Method (HPD): INTCAL13)

(Variables: d13C = -26.8 o/oo)

Laboratory number Beta-554951

Conventional radiocarbon age 2840 ± 30 BP

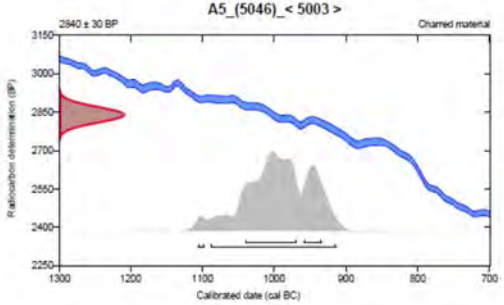
95.4% probability

(93.9%) 1090 - 916 cal BC (3039 - 2865 cal BP)
(1.5%) 1108 - 1099 cal BC (3057 - 3048 cal BP)

68.2% probability

(52%) 1042 - 971 cal BC (2991 - 2920 cal BP)
(16.2%) 960 - 936 cal BC (2909 - 2885 cal BP)

A5_(5046)_< 5003 >



Database used
INTCAL13

References
References to Probability Method
Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.
References to Database INTCAL13
Reimer, et.al., 2013, Radiocarbon55(4).

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • Email: beta@radiocarbon.com

APPENDIX 6: GAZETTEER OF FEATURES ENCOUNTERED IN AREA 5

Feature	*Date*	*Description*	*easting, northing*
Burnt Mound and associated features	Late Bronze Age and Iron Age	Burnt mound comprising two pits, with associated features including a pit to the immediate south and a complex of postholes and small pits, possibly a former windbreak, to the east	234797,393161
Clearance Cairn	Post medieval/modern	A mound of sub-angular pebbles, cobbles and boulders forming a semi-circular shaped cairn measuring 6m by 5.4m and containing post medieval and modern material	234740,393280
Boundary Ditch	Undated	Across the centre of Area 5 as a shallow northwest to southeast ditch extending over 50m in length	234798,393209
Gully	Undated	At the western extent of the northern half of Area 5 was an east-west gully, over 2m in length	234729,393253

APPENDIX 7: POST-EXCAVATION ASSESSMENT METHOD STATEMENT

wardell-armstrong.com

ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

HORIZON

WYLFA NEWYDD

POST EXCAVATION ASSESSMENT METHOD STATEMENT

APRIL 2019

wardell armstrong

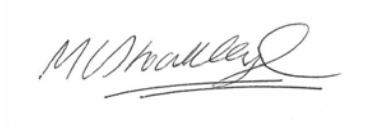
Wardell Armstrong LLP
Marconi Road, Burgh Road Industrial Estate, Carlisle, Cumbria CA2 7NA, United Kingdom
Telephone: +44 (0)1228 550575 www.wardell-armstrong.com

DATE ISSUED: April 2019

JOB NUMBER: **CL12271**

PREPARED BY:

Megan Stoakley — Finds and Archive Specialist



Lynne Gardiner — Senior Environmental Archaeologist

APPROVED BY:

Frank Giecco — Technical Director

Wardell Armstrong LLP is the trading name of Wardell Armstrong LLP, Registered in England No. OC307138.

Registered office: Sir Henry Doulton House, Forge Lane, Etruria, Stoke-on-Trent, ST1 5BD, United Kingdom

UK Offices: Stoke-on-Trent, Cardiff, Carlisle, Edinburgh, Greater Manchester, London, Newcastle upon Tyne, Sheffield, Taunton, Truro, West Bromwich. International Offices: Almaty, Moscow

WYLFA NEWYDD POST EXCAVATION ASSESSMENT METHODOLOGY

Introduction

This document has been prepared to provide the client with an explanation of the Post Excavation Assessment (PXA) process and to provide Wardell Armstrong's own technical team, with clear guidance on undertaking the PXA for the Wylfa Newydd archaeological mitigation works. Post Excavation Assessment (PXA) is the first stage of a process of post-excavation analysis, publication and archive deposition. It provides quantification and initial assessment of the archive resulting from excavation and provides a framework to inform further investigation and publication. It is designed to ensure that Horizon Nuclear Power meet their requirements to secure discharge (by the two primary stakeholders: Gwynedd Archaeological Planning Service (GAPS) and CADW) of the early works archaeological mitigation programme at Wylfa Newydd.

It is based on the requirement described in the Written Scheme of Investigation for Trial Trenching and Excavation (2015) and Written Scheme of Investigation for Strip Map and Sample Excavation and Paleoenvironmental Assessment (2016). It is informed by the following guidance, Association of Local Government Archaeological Officers (ALGAO) Advice Note for Post-Excavation Assessment (2015), Conservation principles for the sustainable management of the historic environment in Wales CADW (2011), Chartered Institute for Archaeologists (CIfA) Standard and Guidance for Archaeological Excavation (2014) sections 3.4 to 3.6, and for human remains The British Association of Biological Anthropology and Osteoarchaeology Human Bones from Archaeological Sites. In addition, GAPS require reference to Society of Museum Archaeologists (1993), Selection, Retention and Dispersal of Archaeological Collections: Guidelines for use in England, Wales and Northern Ireland, as well as Welsh Office Circular 60/96, (1996), Planning and Historic Environment: archaeology.
This current document identifies the stages of the PXA process, then describes the broad tasks required for each stage. The document concludes with a report template containing individual sections within the PXA report and UPD.

Requirement for and Purpose of the Post Excavation Assessment

The PXA will follow a staged process of post excavation assessment detailed in Written Scheme of Investigation for Trial Trenching and Excavation (2015) and the Written Scheme of Investigation for Strip Map and Sample Excavation and Paleoenvironmental Assessment (2016).

As stated in the ALGAO *Advice Note for Post-Excavation Assessment*, "following the completion of archaeological fieldwork, it is standard practice for a post excavation assessment (PXA) to be undertaken". CIfA describe the purpose of a PXA as a means by which "the findings should be assessed against the original project design to determine the extent to which the original research aims have been met, and the identification of any new research questions to be incorporated in a post-excavation project design". CIfA further state that PXA work "must be carried out by suitably qualified and experienced staff, who must be apprised of the project design before commencing work. The post excavation manager should preferably be a corporate member of CIfA. The level of assessment of records and materials should be appropriate to the aims and purpose of the project".

In brief the PXA process involves cleaning, processing, sorting and cataloguing the finds and environmental samples and the ordering of the documentary site records to create an archive, and then assessment of that archive to focus further analysis and reporting on that archive. The archive consists of two elements, the material archive (finds, processed environmental samples and human remains) and the documentary archive (site records and ancillary research documentation such as notes on archival sources).

Post Excavation Assessment Stages and Outputs

The PXA consists of four separate, largely, though not necessarily, sequential stages; processing of the finds, palaeoenvironmental samples and any human remains (the material archive); archival preparation for data assessment and deposition (both material and documentary archive); data assessment and finally reporting. The outputs are two stand alone documents, although often bound together under a single cover as they will be in this case. The documents are the Data Assessment Report (DAR) which quantifies the data, identifies its significance and potential for further research, and the Updated Project Design (UPD), which scopes the response necessary by achieving the site's research potential and provides the basis for a cost for doing so.

The proposed work described in the UPD is entirely separate from the PXA and will form a future stage of work involving any necessary post-excavation research and leading to the

publication of the results of the excavation. This future stage concludes with the deposition of the entire project archive with the Oriel Museum Anglesey. Funding of the required future research, publication and archive deposition for long-term curation is a requirement to secure final discharge of the 2017-2019 phase of fieldwork at the Wylfa site.

For Wylfa Newydd each site will have a separate DAR and UPD to allow GAPS/CADW and the client, to be fully appraised of the justifications for further analytical work. Each site can then be discussed in relation to its specific significance before arriving at a consensus with regard to further work requirements. There will also be a need for an overview DAR and UPD which will have two functions:

- To succinctly summarise the findings of the individual site DARs and UPDs following consultation and provide a cohesive assessment of the whole project as well as a basis for an overall justified costing for future work requirements.
- To provide a research statement regarding the overall potential of the Wylfa Newydd development area. Clearly many of the sites will not merit the publication of a standalone report. Consequently, the research potential of such sites will be best realised in contributing to period-based volumes that address regional research framework questions.

Stage 1 Processing

A summary of the processing requirements is given below. A more detailed breakdown of the required procedures for finds is contained in appendix 1 and for environmental samples in appendix 2.

Environmental sample processing involves sieving individual 10 litre tubs of soil samples for bulk samples (collected from site) in a purpose-built water filtration tank. The flots (floats) and retents (sinks) are then dried, bagged and labelled. More specialised forms of sample processing may be required for other samples taken such as column samples for insects, pollen monoliths or cores, but these represent only a tiny fraction of the samples collected. Human remains (cremated and non-cremated) require different cleaning methods depending on their state of preservation. Non-cremated articulated and disarticulated human remains in good condition will undergo wet cleaning but without the bones being immersed in water. Human remains in poor condition must not be wet-washed and will have to be dry-brushed to avoid unnecessary damage to the remains.

Bulk finds are cleaned by washing. Small finds are cleaned according to the requirements of the material, this usually but not always involves washing. Following cleaning, most finds will need to be dried and some may require stabilisation to preserve them. Cleaning and stabilisation by material and object will be as described in Watkinson & Neal (1998). Specialist conservation will not be routinely undertaken at this stage as this will involve items being sent away to specialist laboratories and the consequent costs, but the conservation need will be defined by a specialist in conservation. Where an immediate conservation need is identified this will be addressed to ensure item stability.

Stage 2 Archival Preparation

Three tasks are required in stage 2 in relation to the material archive, marking in accordance with Oriel Museum guidelines, X-raying metal objects and boxing the finds and human bones for long term curation. There will be some need to carry out X-ray photography of metal objects to be able to identify them and assess their significance. Finds, mainly pottery, will need to be marked as appropriate. As some Prehistoric and Roman pottery is of a sandy fabric this can sometimes be difficult to place a mark directly on the fabric so clear nail varnish is required to prepare the location of the mark. Following marking the finds will be bagged and boxed. The archive boxes need to be made of acid free cardboard for long term conservation storage and will need to be purchased specifically for the project.

The documentary archive should have been appropriately ordered, indexed and catalogued before it left site, but it will require checking and final cross-referencing before it can be assessed. The checking will involve both digital and paper-based records and include a finalisation of plan and section data, both hand-drawn and recorded through a digital medium. Relevant HER entries will need to be listed in full detail. All records will need security copies. Paper records (drawn plans, sections and record sheets) will be scanned for digital archiving. The digitisation of all hand drawn plans and sections is to be avoided as not cost effective. Drawings for digitisation can be selected in the analysis phase when it is known which drawings will contribute to the publication. This ensures that all digitisation will be 'heads up' and only for the purposes of report illustration rather than 'heads down', thus removing the need for digitisation tablets and increasing efficiency.

Stage 3 Data Assessment

In all cases the assessment begins with a quantification of the items to be assessed, whether it be sample residues, finds or site records. The material archive assessment involves separate

assessments of ecofacts, artefacts and any human remains. Further details of the finds assessment are contained in appendix 3.

Every flot and retent will be examined to establish whether they contain plant macrofossils, zooarchaeological remains, snail shells etc, artefacts or metal working residue. Ecofacts, residues and any artefacts are then extracted and examined. Ecofactual assemblages are identified and characterised. The assessment of individual ecofactual assemblages must be undertaken by a suitably-qualified palaeoenvironmentalist.

The finds assessment involves the quantification, identification and dating of the recovered artefacts. The finds assessment can only be compiled by a suitably-qualified finds specialist who can identify and spot-date the artefacts. Where necessary, specialists with local expertise will be consulted, especially regarding the pottery assemblages.

Radiocarbon dating, or any other form of absolute scientific dating, will be undertaken at the assessment stage, though some samples may need to be sent for testing to identify their suitability for dating. As this is an assessment a full suite of dates suitable for Bayesian analysis will not be undertaken but the potential for such future work will be highlighted in the UPD. The documentary archive assessment involves identifying each site's stratigraphic phases assisted by a Harris Matrix. It is required that this will be done using the Harris Matrix generator software. Duplicate and false contexts will be identified, recorded and discarded.

<u>Stage 4 PXA and UPD Reporting</u>

Stage 4 results in the creation of the PXA report and the UPD. A detailed template for producing these documents follows. The documents produced will be technical grey literature reports and not publication reports.

Report Template

The following report template is laid out in accordance with the desired structure and layout of the report. Sentences in italics refer to the required illustrations whether drawings or photographs.

1. **Non-technical summary, including reasons for work, aims and summary results**

2. **Introduction**

2.1 Site location (include eight digit NGR), site code/ PRN reference, and Event Number

2.2 Scope of the project.

2.3 Dates/duration of fieldwork.

2.4 Outline of the site's character (including topsoil, subsoil and substrata descriptions, past land use impacts on preservation and impact of bioturbation) and how the site fits into the local archaeological landscape.

2.5 Brief summary of previous work including directly relevant nearby sites (i.e. likely to be part of same archaeologically represented activity), geophysical results, metal detecting results and evaluation results.

2.6 Explanation of the purpose of the assessment report and organisation of the report (refer to this report template and include as appendix 1).

2.7 *Site location map related to the development area.*

2.8 *Plan of site and excavated area (usually these will be the same).*

3. **Summary of the excavation methodology**

3.1 Proposals set out in the approved Written Scheme of Investigation for the fieldwork (copy of the Written Scheme of Investigation sections 4 and 5 only as appendix 2).

3.2 Any variations from the Written Scheme of Investigation with justifications.

3.3 Site planning strategy with justifications for the applied methodology.

3.4 A description of any avoidance strategies or re-burial methods used to preserve unexcavated archaeological remains in situ, indicating whether or not these will be subject to a monitoring scheme and, if so, providing a description of it or references to supporting relevant documentation.

4. **Site archive**

4.1 Summary details of the contents and organisation of the project archive

4.2 Quantification of documentary archive (including catalogues and indices) and details of current (give date) location of the paper archive. Details of the digital archive and arrangements for storage security.

4.3 Summary of work carried out on the documentary archive during post-excavation assessment.

4.4 Quantification of material archive (by storage box) and details of current (give date) location.

4.5 Summary of work carried out on the material archive, including nature of processing and cleaning, and any necessary preliminary conservation/stabilisation.

4.6 Details of any samples sent for scientific analysis or dating as a necessary precursor to costing a programme of analysis.

4.7 Agreed destination of the site archive (in all instances this will be the Oriel Museum, Anglesey) with a statement of any receiving repository conditions if necessary.

4.8 OASIS reference supported by completed data collection form as appendix 3.

4.9 *Representative sample photographs of site features that aid understanding of the assessment of stratigraphic data*.

5. Stratigraphic data

5.1 Summary of the nature of the investigated features/deposits described by phase in chronological order (not by individual context or feature), supported by a Harris matrix/matrices in appendix 4 (use context group numbers if appropriate).

5.2 Statement of significance of the stratigraphic data.

5.3 *Final pre-excavation plan.*

5.4 *Either an overall plan for all phases or individual phase plans or both as appropriate to the site's complexity.*

5.5 *Sections of key features with a location plan showing position of sections.*

5.6 *If relevant a more detailed plan of key structures.*

5.7 *Where relevant a structure through motion model illustration(s).*

6. Artefacts

6.1 Quantification (by weight in grams for bulk finds) of finds by type.

6.2 Description of condition, stability and the immediate and longer term conservation and storage needs by artefact group.

6.3 An assessment of the character, range and variety, date, meaning and significance of all recovered artefact groups.

6.4 Statement by a recognised specialist on the research potential of each individual artefact group. If no further work beyond assessment is considered necessary this should be clearly indicated.

6.5 Statement of significance for the retention of material and a proposal for a fully justified discard strategy for low/nil value assemblages, in agreement with GAPS/CADW.

6.6 *Supporting finds illustrations at appropriate scales (for the assessment wherever practicable scaled photographs should be used rather than line drawings).*

7. **Palaeoenvironment**

7.1 Quantification (by weight in grams) of the retents and flots available for analysis. Quantification by sample bucket where further portions of a sample are available and the assessment sub-sample has revealed that further sample processing is worthwhile for the additional data it may reveal. Sub-sampling will have been sufficient to characterise and understand a sample.

7.2 Factual summary of each type of sample (e.g. bulk organic, dendrochronological, monolith), quantity, preservation, post-depositional processes, curation and storage need by ecofact group.

7.3 An assessment of the character, range, variety and significance of all ecofactual groups (likely to include plant macrofossils, pollen, animal bone, shell, snails and insects).

7.4 Statement by a recognised specialist on the research potential of each individual ecofact group, including potential to provide scientific dating. If no further work beyond assessment is considered necessary, this should be clearly indicated.

7.5 Statement of significance for the retention of material and a proposal for a fully justified discard strategy for low/nil value assemblages, in agreement with GAPS/CADW.

7.6 *Representative photographs of key assemblages*.

8. **Human remains**

8.1 For inhumations quantify by number of burials and then summarise information on skeletal completeness in a table divided as >75%, -75%, -50%, <25%. For cremations, bone remains from each context should be quantified by weight in grams.

8.2 Factual data about the bone assemblage, describing the provenance of the skeletal material and the general condition of the remains. The condition of the bone will influence the information that can be gained from the assemblage.

8.3 Statement by a recognised specialist on the research potential of the human remains.

8.4 Note on the long-term arrangements for the curation or reburial of the human remains.

8.5 *Plans showing the location of burials or other deposits of human remains*

8.6 *Photographs and/or drawings of inhumation burials in situ or a structure through motion 3d model.*

9. **Discussion**

9.1 A brief summary of the character and significance of the site as represented through its stratigraphic, artefactual and palaeoenvironmental data. Include where relevant the results of any documentary research. If no further work beyond assessment is considered necessary, this should be clearly indicated. If further work is required then include 9.2, 9.3 and 9.4 below.

9.2 A tabulated list of relevant sources discovered (relevant books, articles, HER data, archival sources) quantity, variety, level of study of sources during post-excavation assessment.

9.3 Indicate applied studies that will be necessary for further analytical work. These might include, for example, comparative analysis, archival and/or cartographic research and intra and inter-site spatial analyses, site morphological studies, absolute dating methods, scientific techniques not covered by the standard suite of applications (e.g. specific chemical analyses, thin sectioning for soils or ceramic research, isotope studies, scanning electron microscopy, specific biological analyses etc).

10. **Statement of potential**

10.1 A summary of the potential of the data in terms of local, regional, national and international importance, referencing as relevant regional and national period and subject specific research agendas. This should include:

- an appraisal of the extent to which the site archive might enable the data to meet the original research aims of the project;
- a statement of the potential of the data in developing new research aims, to contribute to other projects and to advance methodologies;
- an assessment of the relevant level at which the site data might be published e.g. site specific publication, project landscape overview or background contextual data (choose one only).

10.2 An informed strategy for the detailed analysis of some or all data groups as recommended by relevant specialists to enable a reconstruction of the history and use of the site to be developed, in line with the site's relevant research potential

(where no further work is recommended this section is not required). This strategy must include provision to incorporate the results of any earlier phases of archaeological work on a specific site, reappraising materials and artefacts recovered during earlier assessment and evaluation phases and, where appropriate, earlier excavation results - including, where possible, from neighbouring sites

10.3 *Map of the site in context at a regional or local level, showing other relevant sites and where appropriate connections and networks.*

11 Bibliography of sources used in the compilation of the PXA

12. Updated Project Design

12.1 Introduction including purpose of the UPD to provide details of a programme of analysis leading to the appropriate mechanism for the dissemination of the results of the project. Also, to provide a basis for costing the programme of analysis, publication and deposition of the archive.

12.2 Justification for the contents of the proposed programme of analysis and any theoretical approaches to be deployed, in relation to the site's statement of potential and proposal for publication/dissemination as appropriate:

- inclusion of main results in an overall synthetic volume only
- thematic paper on a specific research theme
- internet publishing through journal or proprietary website (stating whether all catalogues will be available and interactive)
- short illustrated site report for a journal
- section/chapter in edited monograph
- fully illustrated site monograph
- popular booklet (additional publication only and not to be the primary publication).

12.3 Proposal for analysis of the stratigraphic data concentrated on key feature groups.

12.4 Detail of illustrations required to support the stratigraphic analysis.

12.5 Detail of retention and discard strategy for the material archive.

12.6 Proposals for scientific dating (potentially an initial suite of dates and a second after provisional results from the artefact and ecofact analysis are received).

12.7 Proposals for a Bayesian analysis to refine chronologies, following consultation with Cadw regarding to the selection of contexts and samples for scientific dating.

12.8 Proposals, where relevant, for other forms of scientific analysis such as lipids, strontium or oxygen isotope analysis.

12.9 Details of illustrations required to support the artefact analysis.

12.10 Requirement for conservation works on material archive.

12.11 Proposals for further research, including archive visits and comparative analysis of other investigated relevant sites in order to contextualise the site data.

12.12 Details of resultant technical/archive report.

12.13 Publication report synopsis where relevant, including any additional illustrations required.

12.14 Proposals for monitoring and continued liaison with GAPS and CADW throughout the post-excavation analytical programme.

12.15 Staged programme and timetable for any proposed further work up to and including publication and archive deposition. Task list and Gantt chart.

Task breakdown for PXA

1. **Processing**

1.1 Environmental sample processing

1.2 Cleaning human remains

1.3 Bulk finds cleaning

1.4 Small finds cleaning

1.5 Artefact stabilisation

2. **Archival preparation**

2.1 Finds marking

2.2 X-raying metal objects

2.3 Archive box purchase

2.4 Boxing

2.5 Site record checking and cross-referencing

2.6 Compilation of list of archival sources

2.7 Records scanning

3. **Data assessment**

3.1 Zooarchaeological remains

3.2 Insects

3.3 Snails

3.4 Shells

3.5 Plant macrofossils

3.6 Pollen

APPENDIX 1 METHOD STATEMENT: STAGE 1 FINDS PROCESSING

Finds processing and assessment summary

At stage 1 the finds will be cleaned (usually but not always involving washing). At stage 2 the finds will marked, bagged and boxed. Once this is done in stage 3 the finds will be quantified and assessed; this involves the creation of an Excel spreadsheet into which are recorded numbers of items, weight and spot-dating and the finds are cross-referenced to the stratigraphic contexts from which they were derived. Having done this in stage 4 a report will be prepared on the assessment results. The work will be solely aimed at identifying significant assemblages for further future analysis as will be detailed in the Updated Project Design.
The following specification allows for the cleaning of bulk finds.

Washing and cleaning

Bulk artefacts (pottery, animal bone, glass, ceramic building material) are bagged up on-site and returned to the post-excavation department. The finds are washed and cleaned using two bowls (one to wash, one to rinse) and toothbrushes. The finds are placed in trays linked with newspaper – the site code, context number and (if applicable) the small find number is written either on the newspaper or on a tag attached to the tray with permanent marker. To increase the efficiency and speed of the finds' drying time, a drip-tray system is employed in

which finds are put on newspaper first before being placed in the tray. This ensures excess water is soaked up (and is particularly useful for large, heavy fragments such as architectural stone and ceramic building material).

Organic finds are processed differently and will depend on whether they have been recovered from waterlogged deposits; leather, shale, jet, wood and worked bone that has been recovered from waterlogged deposits needs to be kept dark, dry and cool. Objects are cleaned primarily with soft wet brushes and they are bagged (with water in the bags) and are put in an organics fridge.

All metalwork (including copper alloy, lead and iron) and oyster shell is dry-brushed. Delicate metal and non-metal small finds are dry-brushed and placed in crystal boxes in trays on acid-free tissue paper. Plaster/mortar are dry-brushed and placed in labelled trays.
Human remains (cremated and non-cremated) are processed differently and will require different cleaning methods depending on their state of preservation. Non-cremated articulated and disarticulated human remains in good condition will undergo the same processing as bulk finds, but the bones are not immersed in water. The human remains will only be marked depending on the requirements of the curator and county repository. Human remains in poor condition must not be wet-washed and will have to be dry-brushed for remains to stabilise.

Time estimates for finds washing and cleaning

It must be emphasised that finds washing is hugely dependent on a wide range of variables, including the original burial environment (acidic soils, different soil types e.g. clay versus sand) and previous activity on the site (agricultural activity such as ploughing may damage the finds).

Find type	**Weight**	**Time**
Prehistoric pottery	1kg	1-2 hours
Roman pottery	1kg	1-1.5 hours
Saxon pottery	1kg	1-1.5 hours
Medieval pottery	1kg	1 hour
Post-medieval pottery	1kg	1 hour
CBM & daub	1kg	1-1.5 hours
Animal bone (good condition)	1kg	1-1.5 hours
Animal bone (bad condition)	1kg	1-2 hours

Human bone (complete skeleton, good condition)	7-8kg	1-1.5 days
Human bone (bad condition)	1kg	1-2 days
Glass	1kg	1-1.5 hours
Metalwork	1kg	1-1.5 hours
Oyster shell	1kg	1-1.5 hours
Flint	1kg	1 hour
Stone	1kg	1 hour
Leather	1kg	1-1.5 hours
Archaeometallurgical waste	1kg	1 hour
Plaster/Mortar	1kg	1-2 hours
Clay Pipe	1kg	1-1.5 hours

APPENDIX 2 METHOD STATEMENT: STAGE 1 ENVIRONMENTAL PROCESSING

Environmental processing and assessment summary

For environmental samples in stage 1 the samples will be processed. In stage 2 this material will be dried, bagged and sorted. In stage 3 this material will be examined to establish whether or not they contain plant macrofossils, zooarchaeological remains, artefacts or metal working residue. Having done this in stage 4 they will be required to prepare a report on the assessment results. They will not be instructed to analyse the materials derived from the flots and retents at the assessment stage. The work will be solely aimed at establishing significant flots and retents for further future analysis as will be detailed in the Updated Project Design. The following specification allows for the processing and assessment of bulk environmental samples and for waterlogged materials from a General Biological Analysis sample (GBA).

General Biological Analysis sample

The colour, lithology, weight and volume of the sample will be recorded on the sample sheet. The sample will be then be processed. All samples will be floated on a 250-300 mm mesh and the heavy residues washed over a 0.5-1 mm mesh as required by SCCAS. The flot should be air dried.

The flot should be 100% sorted with all relevant material being recovered, once this process has been completed, the remaining material may be discarded. Any plant remains should be quantitively recorded. All ecofactual material should be removed as should relevant artefactual material. Earthworm and nematode capsules should be counted but not recovered. If charcoal-rich a 2mm sieve should be used, the resultant material should then be

subject to the same process outlined above. The data from the flot sorting should then be recorded into a spreadsheet (Excel) or database (Access).

Once dried the entire retent residue should be sorted. In order to ease sorting, the dried residues may be passed over a 4mm mesh, this also aids charcoal retention of a suitable size for ID. The dried residues should be described (colour, lithology, weight and volume of the individual fractions).

The <4mm fraction will be scanned with a magnet in order to pick up micro-slags, and 100% sorted for the recovery of artefacts and ecofacts.

The fine fraction will be sorted and any relevant material recovered. The sorted residues can then be discarded. Any resulting artefactual and ecofactual material should be recorded (abundance/actual quantities dependent on material and weighed).

Recording of the Environmental Data

Where possible quantify, counts of over 50 individuals per species can be referred to by levels of abundance, such as +=50-100, ++=100-200, +++=200-500 and ++++ to indicate greater than 500. If identification is not to species level then a distinction between cereals and weeds species (or non-economic taxa) should be made. The presence of chaff should be noted.
For long term storage, the plant remains should be stored in soda glass tubes with sample information, and identification (where relevant) clearly marked using pencil and a Tyvek label placed inside the tube.

Waterlogged Samples

Between 250 and 500ml of a 1l sub sample from the GBA is processed by placing the material in a 500µm sieve and washing the sample through until all of the sediment has been removed. The latter is essential or the fluid in which the sample is stored will become cloudy. Once clean the sample is removed from the sieve to an airtight jar and stored in ethanol (95% alcohol).

Paraffin Flotation

The remaining 9l of the GBA will be placed into a bucket filled with hot water to disaggregate the sample. A handful of the material is then placed in a 300µm sieve and washed until as much of the sediment as possible has been removed. The material is then tipped from the

washing sieve into a further sieve and allowed to drain and dry. Once the sample has been completely processed, it will then be left to dry for an hour. The sample is then tipped back into the bucket and enough paraffin to coat the sample is added –multiple buckets may be required if the sample is large. This will be then allowed to stand for 15 minutes and cold water added to the bucket.

The bucket is then allowed to stand for a further 15 minutes. At this stage any insect sclera should have risen to the surface of the water as the paraffin adheres favourably to the chitin which forms the exoskeleton of the beetle. The top 2cm of bucket is then poured off through a 300µm sieve and this process is repeated twice more.

At the end of this process, the flots within the sieve will be washed using domestic washing up-liquid until all traces of both the paraffin and detergent have been removed. The latter is essential as any trace of either left on the flot will render the storage medium cloudy. The sample is then stored in ethanol (95% alcohol) inside an airtight jar.

METHOD STATEMENT STAGES 2 AND 3 FINDS ASSESSMENT

Summary

The finds assessment involves the quantification, identification, dating and significance assessment of the recovered artefacts. The assessment of significance happens in stage 4 when the context of the finds can be taken into account as their significance is not solely based on the object's intrinsic interest. The finds assessment can only be compiled by a suitably-qualified finds specialist who can identify and spot-date a wide range of artefacts.

The finds assessment will adhere to a number of national guidelines, including CIfA (2017), Historic England, EAC (2014), Brown (2011) and Watkinson & Neal (1998) as well as the specific county museum's own standard requirements plus national and regional fabric codes (prehistoric through to post-medieval pottery). The finds assessment will make recommendations to be included in the UPD (updated project design). These may include further literary research and comparative analysis, AMS C14 dating, strontium or oxygen isotope analysis, Bayesian scientific methods plus illustration / photography.

The following specification allows for the quantification, identification and dating and significance assessment of the finds.

Stage 2

Certain types of find, when dry, are then marked; this can be dependent on the curator and the county repository. Finds, including pottery, CBM, animal bone, glass and clay tobacco pipe, are marked with the site code, context number, small find number and the museum accession number (if applicable). The finds are marked using permanent Indian ink (Winsor & Newton); for finds with rough surfaces (applicable to all types of pre post-medieval pottery), a small patch of acrylic or nail varnish is applied to provide a smoother surface.

Types of finds and ecofactual remains that are not marked include human bone, leather, shale, jet, all metalwork, plaster/mortar, oyster shell, slag and wood.

Once the finds are dry and marked, they are quantified and bagged in zip-lock self-sealable bags and the site code, context number, small find number and museum accession number is written on the bags. For small finds and delicate/fragile artefacts, 2 layers of acid-free ridged

foam is cut and inserted into the bag beforehand and the artefact is sandwiched between the two layers.

The non-metal artefacts, when bagged, are placed in acid-free archive boxes and they are ordered by material type and by context. Boxes should not weigh over 6kg. Metal artefacts and some organic finds are kept in Stewart tubs with a bag of silica gel and humidity strip indicators. WA Ltd's in-house archive labels are then put on the front of the box.

Time estimates for finds marking and bagging and boxing

Marking 30-40 seconds per artefact e.g. per bone, per pot sherd.

Bagging and boxing 1 box at 6 kg full capacity – 30-40 minutes.

Stage 3

Once processed (cleaned and dried stage 1 and marked stage 2) the finds will need to be assessed. In stage 3 preliminary recording and description of the assemblage is undertaken and an Excel spreadsheet is created. This stage is where the artefacts are quantified, weighed, spot-dated and where additional comments / notes are made. The Excel spreadsheet (or Access database) forms a critical part of the finds assessment and every finds report must have one. The preliminary recording is conducted by a suitably-qualified finds specialist, with a proven record and appropriate local knowledge.

Time estimates for preliminary recording

Recording and describing 1 box (6 kg) of finds = 1-3.75 hours dependent on the nature of the items.

Materials costs to be considered to PXA

In addition to the person costs there is a material cost for storage materials, including boxes, silica gel, acid free tissue and zip-lock bags, for the artefacts and the human bone. For example, finds and documentary archive boxes need to be acid free for long term storage. Appropriate temporary storage and monitoring of waterlogged artefacts is required, prior to conservation.

There will be some need to carry out X-ray photography of metal objects to be able to assess their significance.

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong

wardell-armstrong.com

STOKE-ON-TRENT
Sir Henry Doulton House
Forge Lane
Etruria
Stoke-on-Trent
ST1 5BD
Tel: +44 (0)1782 276 700

BIRMINGHAM
Two Devon Way
Longbridge Technology Park
Longbridge
Birmingham
B31 2TS
Tel: +44 (0)121 580 0909

BOLTON
41-50 Futura Park
Aspinall Way
Middlebrook
Bolton
BL6 6SU
Tel: +44 (0)1204 227 227

CARDIFF
Tudor House
16 Cathedral Road
Cardiff
CF11 9LJ
Tel: +44 (0)292 072 9191

CARLISLE
Marconi Road
Burgh Road Industrial Estate
Carlisle
Cumbria
CA2 7NA
Tel: +44 (0)1228 550 575

EDINBURGH
Great Michael House
14 Links Place
Edinburgh
EH6 7EZ
Tel: +44 (0)131 555 3311

GLASGOW
2 West Regent Street
Glasgow
G2 1RW
Tel: +44 (0)141 433 7210

LEEDS
36 Park Row
Leeds
LS1 5JL
Tel: +44 (0)113 831 5533

LONDON
Third Floor
46 Chancery Lane
London
WC2A 1JE
Tel: +44 (0)207 242 3243

MANCHESTER
76 King Street
Manchester
M2 4NH
Tel: +44 (0)161 817 5038

NEWCASTLE UPON TYNE
City Quadrant
11 Waterloo Square
Newcastle upon Tyne
NE1 4DP
Tel: +44 (0)191 232 0943

TRURO
Baldhu House
Wheal Jane Earth Science Park
Baldhu
Truro
TR3 6EH
Tel: +44 (0)187 256 0738

International offices:

ALMATY
29/6 Satpaev Avenue
Regency Hotel
Office Tower
Almaty
Kazakhstan
050040
Tel: +7(727) 334 1310

MOSCOW
21/5 Kuznetskiy Most St.
Moscow
Russia
Tel: +7(495) 626 07 67

wardell armstrong