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HORIZON NUCLEAR POWER

WYLFA NEWYDD, ANGLESEY

AREA 11

ARCHAEOLOGICAL POST-EXCAVATION ASSESSMENT REPORT

DECEMBER 2021

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HORIZON NUCLEAR POWER

WYLFA NEWYDD, ANGLESEY

ARCHAEOLOGICAL POST-EXCAVATION ASSESSMENT REPORT

DECEMBER 2021

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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 11, which was undertaken in accordance with a Written Scheme of Investigation (WSI) (Horizon Nuclear Power (HNP) 2015) and the Technical Update (HNP 2017). All documents were agreed with Gwynedd Archaeological Planning Services, the archaeological planning advisors to the Isle of Anglesey County Council.

The archaeological work was undertaken over five days between the 10th August and the 16th August 2017 and comprised the excavation of a 194m^2 area. The investigation revealed features that included a small number of pits and postholes of undetermined date and a spread of material dated by radiocarbon means to 155 BC-AD 52 corresponding to the Late Iron Age.

The Late Iron Age to Early Roman features may have been part of an individual event with a relatively short duration. There is a lack of visible settlement activity in the immediate vicinity of Area 11 itself, however, discoveries at Area 9, 130m to the west, indicate possible contemporary settlement. Therefore, Area 11 might represent outlying activity such as agricultural practices taking place at a specified point in the landscape and not part of an occupation site, such as small-scale processing, gathering, modifying or temporary clearance. The restricted amount of material recovered from the various fills indicates that there was discard of charred plant material, charcoal and marine molluscs, although the small quantities may have derived from portable food rather than demonstrating functional use of the features.

The assertion that industrial or metal working may have occurred at Area 11, based on the discovery of fired clay and industrial waste, remains uncertain. Both are ambiguous in their nature. The fired clay may have been natural material transformed as a result of proximity to heating activities or dumped material, rather than representing specifically formed linings or structural elements. The magnetised material seems to be a common element of the natural substrates and the industrial waste of requires confirmation through full analysis.

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 diffiniedig, mae'r adroddiad hwn yn manylu canlyniadau cloddfa archaeolegol yn Area 11. 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.

Roedd y gloddfa yn mesur 194m², cwblhawyd y gwaith maes dros bum diwrnod rhwng y 10fed a'r 16eg o Awst 2017. Darganfyddwyd nodweddion gan gynnwys nifer o bydewau a thyllau pyst o ddyddiad anhysbys a lledaeniad o ddyddod a ddyddwyd trwy ddulliau radiocarbon i 155CC-52OC, yr Oes Haearn Hwyr.

Mae'n bosib bod y nodweddion Oes Haearn Hwyr i Rufeinig Cynnar yn rhan o ddigwyddiad byr unigol. Ni nodwyd unrhyw dystiolaeth o anheddiad yn agos i Area 11 ond mae darganfyddiadau yn Area 9, 130m i'r gorllewin, yn dystiolaeth o anheddiad gyfoes posib. Felly, mae'n bosib bod Area 11 yn cynrychioli gweithgaredd amaethyddol fel prosesu, casglu, addasu neu glirio tu-hwnt i'r prif anheddiad. Mae'r nifer bach o ddeunydd adenillwyd o'r dyddodion o'r safle yn dangos bod gweddillion planhigion wedi ei llosgi, golosg a chregyn mor yn cael eu gwaredu, er mae'n bosib iddynt gael eu cario i'r safle yn hytrach na dangos pwrpas y nodweddion.

Mae'r awgrymiad bod gwaith metal neu ddiwydiannol wedi digwydd yn Area 11, yn seiliedig ar ddarganfyddiad o glai llosg a gwastraff diwydiannol, yn ansicr. Mae natur y ddwy elfen yn amwys. Mae'n bosib bod y clai wedi ei losgi gan ei fod yn agos i weithgaredd poeth, a dim yn elfen o strwythur na leinin pwrpasol. Mae'n ymddangos bod deunydd magnetig yn elfen gyffredinol yn y swbstrad naturiol, bu angen cadarnhad trwy ddadansoddiad llawn.

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)), and Jenny Emmett, Senior Planning Archaeologist at Gwynedd Archaeological Planning Service. 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, assisted by Vix Hughes. The figures were produced by Helen Phillips. The finds assessment was undertaken by Sue Thompson with contributions from Megan Stoakley. Freddie Sisson supervised the environmental team and wrote the palaeoenvironmental assessment; the team consisted of, Megan Lowrie and Katherine Bostock. The palaeoenvironmental assessment was edited by Lynne Gardiner. 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 11, Field L1(W) West, at Wylfa Newydd, Anglesey, centred on National Grid Reference (NGR): SH 35720 93930 (Figure 1). This excavation was one of multiple defined areas excavated as part of a large scheme of works commissioned by the Client who intends 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 discussions 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. Within Area 11, PRN76016 has been assigned to the general undated activity. Further PRNs assigned to this area are presented in Table 1.1.

Table 1.1: Primary Reference Numbers (PRS for Area 11)

PRN	Description	Associated contexts/PRNS
PRN91988	Single posthole, Late Bronze Age to Iron Age	[11018]
PRN91989	Elongated pits, Late Bronze Age to Iron Age	[11030] and [11032]
PRN91990	Pit, Late Iron Age to Early Roman	[11008]
PRN91991	Spread, Late Iron Age to Early Roman	[11016] and [11035]
PRN91992	Postholes, Late Iron Age to Early Roman	[11024] and [11036]
PRN91993	Service trench, industrial and modern	[11022]

1.3 Project Documentation

1.3.1 The project conforms to a brief produced by HNP which was prepared in consultation with the Gwynedd Archaeological Planning Service (GAPS), the archaeological planning advisor to the Isle of Anglesey Council. A Written Scheme of Investigation (WSI), was then produced to provide a specific methodology based on the brief for a programme of archaeological excavation (HNP 2015). 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 11, the subsequent programme of post-excavation assessment, and the results of this scheme of archaeological excavation and accords with the Post-Excavation Assessment Method Statement. It follows on from a sequential series of works consisting of desk-based assessments, geophysical surveys and evaluation trenches culminating in the excavation fieldwork.

1.3.3 The excavation of Area 11 was undertaken between the 10th and 16th August 2017, in Field L1(W) (Figure 2). The area of investigation targeted features recorded during a previous archaeological evaluation.

2 METHODOLOGY

2.1 Standards and Guidance

2.1.1 The archaeological excavation was undertaken following the Chartered Institute for Archaeologists (CIfA) *Standard and guidance for archaeological field excavation* (CIfA 2014a), and in accordance with the Wessex Fieldwork Recording Manual (2015) and the *Standard and guidance for the collection, documentation, conservation and research of archaeological materials* (CIfA 2014b).

2.1.2 The fieldwork programme was followed by an assessment of the data as set out in the aforementioned standards, as well as the guidelines from Historic England (MoRPHE 2015).

2.2 Archaeological Excavation

2.2.1 The excavation comprised the strip, map and sample of an area measuring 15.5m in length and 12.5m in width, a total area of 193.4m^2, situated in Field L1(W), within the northeastern part of the wider nuclear power station development area.

2.2.2 The general aims of the project 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; and
- 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 specific to the Area 11 excavation:

- to address archaeological research objectives posed by the Research Framework for the Archaeology of Wales (CIfA Cymru/Wales 2017);
- to gain insights into the local farming economy and the wider exploitation of the natural environment – with particular reference to the exploitation of lakes and bogs (such as the adjacent SSSI site) and the sea;
- to gain insights into regional, national and international trade (via the analysis of recovered artefacts) especially in such products as pottery, glass and metalwork, and how the development of social networks fitted into this;
- to gain insights into social organisation and settlement hierarchies; and
- to develop a better understanding of industrial activity during the prehistoric periods, particularly with reference to stone quarrying and stone/ore resource use in coastal regions and the exploitation of superficial deposits of stone and ore.

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. In the case of burnt spreads or extensive deposits these were excavated in quadrants. Once completed, all features were recorded according to the Wessex standard procedure (Wessex Archaeology 2015).

2.2.4 A number of the features had been previously identified during the 2017 Headland evaluation and in some cases the features were re-excavated to either fully remove the remaining fill material, or to re-establish the features in the wider context of the excavation.

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

2.2.6 All finds encountered were retained on site and returned to the 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.

2.2.7 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 SITE ARCHIVE

3.1 Description

3.1.1 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 archive can be accessed under the unique project identifier WA19/CL12283/Area 11/35-2016.

3.1.2 The Site Archive comprises the material and documentary archives as follows (Table 3.1).

Category	Quantification
Context Sheets	33
Small finds	0
Bulk finds	7g
Environmental samples	4 samples (23 l)
Monochrome film	0
Digital photographs	43
Rectified photographs	0
Hand drawn plans	0
Hand drawn sections	12
GPS survey pre-excavation plans	Yes
GPS survey excavation plans	Yes
TST surveyed excavation plans	No

Table 3.1: Quantification of excavation data

4 BACKGROUND

4.1 Location and Geological Context

4.1.1 Area 11 is located on the north Anglesey coast, approximately 2km west of the village of Cemaes, in the northern part of the proposed development area. The nearest village is Tregele, approximately 1 km to the south (Figure 1).

4.1.2 Area 11 was in a field originally designated as F2 during the evaluation phase but known as in Field L1(W) at the excavation phase. The site is situated on the coast and small cliffs drop away to the immediate north, into Cemaes Bay. The existing nuclear power station, built in the 1960s, lies *c.*400m to the west. The Tre'r Gof wetland, a Site of Special Scientific Interest (SSSI) lies immediately to the south of, and within the southern limit of Field L1. The area of investigation lies at a height of *c.*20m aOD (above Ordnance Datum) with the ground sloping down gently to the northeast.

4.1.3 The site is approximately 194m^2 in size and is roughly rectangular in shape. At the time of excavation, the site comprised improved agricultural land characterised primarily by enclosed grazing fields.

4.1.4 The underlying solid geology within the area of investigation is mapped as schist of the Gwna Group formed during the Ediacaran and Cambrian periods between 635 and 508 million years ago. This is overlain by superficial deposits of Devensian Till deposited between 116 and 11.8 thousand years ago during the Quaternary period (BGS 2019). The natural substrate observed during the current phase of works comprised mid-orange brown clayey sand with frequent gravels and pebbles 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), which was later reviewed and updated (Jacobs 2015). It is not intended to repeat that information here and what follows is an overview relating directly to the immediate environs of Area 11. For further details please refer to the original documents.

4.2.2 ***Period 1 - Palaeolithic and Mesolithic (25 000–4000 BC):*** There is no known Palaeolithic or Mesolithic activity within Area 11.

4.2.3 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).

4.2.4 ***Period 2 – Neolithic and Early Bronze Age (4000 – 1500 BC):*** There is no previously known Neolithic or Early Bronze Age activity within Area 11. Across Anglesey 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.

4.2.5 Changes and transitions are evident in the prehistoric period, including the change from communal burial practices to individual burial customs, as evidenced by urn burials containing cremated remains and inhumations within cists.

4.2.6 Burnt mounds dating to the Bronze Age (*c.*2600-700 BC) are also common throughout Anglesey and North Wales (GAT 2012b). These are typically located near to, or alongside watercourses either in groups or individually (*ibid*). Burnt mounds are found at Carrog (PRN 27515) located nearly 2km to the east of the proposed development site, and east of Penciw (PRN 3565) located nearly 6km to the east of the proposed development site (*ibid*).

4.2.7 Prehistoric remains were uncovered during the evaluation phase in nearby Fields K1, K4 and C15 to the south. These consisted of a substantial burnt mound and a large number of pits which contained both prehistoric pottery and lithic tool debitage. Prehistoric activity was also noted within Field L1, in the form of an unusual, coastal burnt mound, to the west of Area 11 (Wessex Archaeology 2016).

4.2.8 ***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 11.

4.2.9 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.

4.2.10 The archaeological evaluation trenches in Fields L8 and L12 uncovered significant prehistoric activity in the form of a hilltop ring ditch, 240m to the south-southeast (Wessex Archaeology 2016). Late Iron Age to Early Roman activity was also seen in Field F1 to the west, with significant contemporary settlements to the south, in E3 and O5.

4.2.11 ***Period 4 – Roman (AD 43 – 410):*** There is no known Roman activity within Area 11.

Anglesey was invaded in *c.*AD 60-61 by the Roman army and there is evidence of settlement sites, ephemeral military establishments (Jacobs 2015), scatters of Roman artefacts and Romano-British enclosure sites.

4.2.12 The 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.

4.2.13 ***Period 5 - Early Medieval (AD 410 – 1100):*** There is no previously known Early Medieval activity within Area 11. An Early Medieval cemetery has been uncovered *c*. 50m to the south-east within Area 15, with possible contemporary settlement features recorded in Area 12 - 100m metres east of Area 11 (Headland Archaeology 2017, 15-18).

4.2.14 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*).

4.2.15 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*).

4.2.16 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.

4.2.17 ***Period 6 - Medieval (1100 – 1539):*** By the 12th century, Area 11 was located within the *Talybolion commote* (a recognised regional unit of royal administration) with a royal manorial centre located at Cemaes (GAT 2012b).

4.2.18 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*).

4.2.19 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*).

4.2.20 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.

4.2.21 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.

4.2.22 To the southeast, in Field L2, several trenches revealed the presence of a large east-west aligned ditch in Area 17, which corresponded to a surveyed geophysical anomaly and accorded with the projected line of an existing field boundary. The boundary was interpreted as a functional boundary with at least some defensive or visibly imposing element, likely to have been in use for an extensive period of time. The upper fill contained occasional charcoal flecks and a sherd of 13-14th century medieval pottery (Headland Archaeology 2017, 15).

4.2.23 ***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*).

4.2.24 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.

4.2.25 ***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.

4.2.26 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. The late 18th to 19th century land improvements are likely to have removed any remains of earlier surface and buried

near surface features, though fairly deep soils may have protected features cut into the substrata

4.2.27 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.

4.2.28 The archaeological evaluations (Headland Archaeology 2017, Wessex Archaeology 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. 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).

4.2.29 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.

4.2.30 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.

4.2.31 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 (GAT 2012b) noted that the linear features identified by the geophysical survey (see below) matched field boundaries marked on first edition Ordnance Survey (OS) mapping onwards. It concluded that the area may contain 'background agricultural features' such as field boundaries and ditches.

4.3.3 ***Geophysical Survey:*** The surveys (ASWYAS 2015; GAT 2011a 2011b and 2012a) did not identify any potential archaeological features, other than possible boundary ditches which correlated with historic OS mapping.

4.3.4 ***Archaeological Evaluation:*** Area 11 in Field L1(W), was in a field originally designated as F2 during the evaluation. Trial trenching took place in 2016 (Headland Archaeology 2017) and comprised a total of 48 trenches in Field F2. One northwest to southeast orientated Trench, 2196, contained two ditches and four pits. The fills contained charcoal, charred grain and crushed shells. A C14 date from a charred grain returned a date of AD 60, the very end of the Iron Age in this area, around the time of the first Roman invasion of Anglesey under Suetonius Paulinus.

5 ARCHAEOLOGICAL EXCAVATION RESULTS

5.1 Introduction

5.1.1 The excavation of Area 11 was undertaken in a one-week period in August 2017 in Field L1(W) (Figure 2). The 194m^2 area of investigation targeted features encountered during the previous archaeological evaluation. The excavation revealed a focus of concentrated activity covering an area approximately 20m by 10m in the southern half of the defined area. The location of this activity corresponded with evidence recorded during the evaluation, and some re-excavation of features occurred. 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 The geological substrate **(11003)** consisted of a mid orangey-brown, clayey sand with abundant gravel and pebbles (Plate 1) and was overlain by a 0.56m thick deposit of mid orangey-brown, loam subsoil **(11002)**. The site was sealed by a 0.36m thick topsoil **(11001)** comprised of mid greyish-brown, silty clay with abundant gravel and pebbles.

5.2.2 All features were stratigraphically sealed by the subsoil and truncated the underlying natural substrate.

5.3 Natural features

5.3.1 A total of three discrete features were investigated and determined to be of natural origin **[11004]**, **[11010]** and **[11026].** These were characterised as irregular or oval in plan with steep irregular to concave sides and concave to flat bases. They varied in size between 0.47-2.49m by 0.38-1.77m and 0.08-0.47m deep (Plate 2). Each feature contained a single fill, a loose, dark brown to mid reddish brown, silt or silty sand **(11005)**, **(11011)**, and **(11027)**. The slightly asymmetrical forms and nature of the fills suggested that the features were the result of tree/shrub root disturbance, possibly resulting from uprooting (tree throws) or *in situ* decomposition.

5.4 Period 3 Late Bronze Age to Iron Age

5.5 *Phase 1*

5.5.1 The earliest archaeological feature encountered was a single post-hole **[11018]**, circular in plan with steep straight sides and a concave base (Plate 3), PRN91988. It measured 0.22m in diameter by 0.13m deep, and contained a mid brown, silty loam

fill **(11019)**. Post-hole **[11018]** was overlain by a shallow feature **[11016]**.

5.5.2 Also assigned to this phase were two ambiguous features **[11030]** and **[11032]** which were cut by shallow irregular feature **[11034]**. Both were irregular linear features, orientated northeast-southwest with steep concave sides and concave bases, and both assigned PRN91989. The features were likely to be elongated pits rather than linear features, neither extending beyond 1.5m in length.

5.5.3 Feature **[11030]** (Plate 4) was to the south and may equate with feature [**2196-004**] seen in the evaluation. It was shallower and had a gentler U-shaped profile. The single fill **(11031)** contained charcoal fragments but no artefacts.

5.5.4 It should be noted that the evaluation indicated that feature [**2196-004**] truncated an earlier feature, [**2196-008**], which in turn truncated the earliest feature [**2196-006**], a pit with five distinct fills, (**2196-016** at the base to **2196-020** at the top). This feature was not seen or investigated in the excavation phase. The most likely candidate would be **[11006]**, which had been physically truncated.

5.5.5 Feature **[11006]** had a single reddish-brown, sandy clay fill **(11007)** (Plate 5). No charcoal was recovered from the environmental sample and no artefactual material was encountered.

5.5.6 Feature **[11032]**, (Plate 6) to the north, was deeper, with a steeper V-shaped profile, and may have equated to [**2196-009**]. It had a single fill **(11033)** with charcoal inclusions but no artefacts. Feature [**2196-009**] was seen to have two fills a lower sterile (**2196-011**), beneath a charcoal-rich deposit (**2196-012**) which contained a chert artefact. Charred cereal grain (wheat) from (**2196-012**) returned a radiocarbon date of 1958 +/-29 Cal BP, corresponding to a date range of 39 BC to AD 88 (Headland Archaeology 2017), a Late Iron Age to Early Roman origin.

5.5.7 It should be noted that the evaluation indicated that feature [**2196-009**] truncated an earlier pit [**2196-021**], and the single fill (**2196-022**) contained mottled silty clay with a very high frequency of shell fragments, along with occasional charcoal flecks, fired clay and small rounded stones. The pit was interpreted as a midden, or dump of refuse resulting from the processing of edible crustaceans and a possible nearby industrial process such as metal working (Headland Archaeology 2017). No evidence of this midden was recorded during the excavation.

5.6 ***Phase 2***

5.6.1 Post-hole **[11018]** was overlain by deposit **(11017)** which partly filled irregular feature/natural hollow **[11016]**, PRN91991. A similar feature **[11034]**, approximately 0.5m to the north, may have been a discontinuous part of feature **[11016]**, both elements of a previously intact larger entity, since eroded. The features were irregular shaped with shallow concave sides and flat bases. They measured between 1.96-3.00m, by 1.00m and 0.20m deep (Plate 7). Within the features the sediments **(11017** and **11035)** comprised dark blackish-brown to blackish-grey, sandy silt with small to medium sub-angular and angular stones, and charcoal (Plate 8).

5.6.2 No finds were recovered from the deposits, but a small amount of possible industrial waste was recovered from a sample of **(11035)** although both the evaluation and excavation results are inconclusive as to whether the remains are a direct result of metal working or alterations to natural material. The environmental sample also demonstrated the presence of barley and wheat as charred cereal grains. A radiocarbon date obtained from charred ivy produced a date range of 155 BC to AD 52, within the Late Iron Age to Early Roman period. The deposits might have resulted from work areas or trample, forming depressions within which material accumulated.

5.6.3 An associated shallow depression **[11028]** adjoined the spread **(11035)** but no stratigraphic relationship was established; it was assumed they were contemporary. The clay interface **[11028]**, was sub-circular with gradual to steep concave sides, an irregular base and measured 0.56m by 0.47m, and 0.09m deep (Plate 9). The clay deposit, **(11029)** comprised hard, light whitish-yellow clay with rare small stones but no artefactual or ecofactual material.

5.6.4 Potentially contemporary with, and in close proximity to, the irregular spreads **[11016]** and **[11034]** were four discrete features **[11008]**, **[11020]**, **[11024]**, and **[11036].** The largest of these features, pit **[11020]**, was located 6m to the northwest of the spreads. It was sub-circular in plan with steep concave sides and a concave base and it measured 2.80m by 2.40m and 0.25m deep (Plate 10). The single light yellowish-grey, clay fill, **(11021)**, contained gravel inclusions but no artefacts or ecofacts.

5.6.5 Pit **[11008]**, located to the south of the spreads, was irregular in plan, with concave sides and base (Plate 11), PRN91990. It measured 1.17m by 0.95m, was 0.19m deep and the single fill **(11009)**, was a dark blackish brown silty sand with occasional sub-angular stones but no artefacts.

5.6.6 Two smaller features **[11024]**, and **[11036]** were located immediately north of the spreads, PRN91992. They were both circular to oval in shape with steep concave to straight sides and flat bases, measuring between 0.48-0.58m, and 0.19-0.37m deep (Plates 12 and 13). They each contained a single fill **(11025)**, and **(11037)**, which were dark greyish-brown to mid brownish-grey, silty clays with occasional sub-rounded stones. Four very small fragments of highly abraded bone were recovered from fill **(11025)** and might represent discarded domestic waste. Both these features had better definition and appeared to be more deliberate, but neither had material within them to elucidate the origin. The size might indicate a medium posthole rather than small pit and, given their position adjacent to spread **(11035),** they might have been structural in origin.

5.7 Period 8 Industrial and Modern

5.7.1 A northwest-southeast aligned service trench **[11022]**, PRN91993, which extended over 27m across the site, was 3.5m wide and 1.4m deep, and truncated the area to the northeast of the archaeological features. The modern pipe trench was filled with dark greyish-brown, sandy clay **(11023)**, the result of rapid and deliberate backfill.

6 FINDS ASSESSMENT

6.1 Introduction and Methodology

6.1.1 A total of four fragments of animal bone, with a combined weight of 2g, were recovered from one context at Area 11. Quantification of bulk finds by material and context is given in Table 5.1.

6.1.2 All finds were dealt with according to the recommendations made by Watkinson & Neal (1998) and to relevant CIfA standards and 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 11/35-2016.

6.1.3 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).

Context	Material	Quantity	Weight (g)	Comments
11025	Animal Bone	4	2	Not identifiable to species, probable limb bones, burnt domestic food waste

Table 6.1: Quantification of Bulk Finds by Context and Material

6.2 Animal Bone

6.2.1 Four tiny fragments of bone with a combined weight of 2g were recovered from context **(11025)**. The animal bone is in poor condition and is highly abraded. The animal bone is burnt and calcined white; the bone likely comprises limb bone fragments and it was not possible to identify the fragments to a species. It is likely to represent burnt domestic food waste.

6.3 Finds from Environmental Samples

6.3.1 A total of 5g of industrial waste was recovered from sample **<11003> (11035)**. The fragments are very small and highly abraded; the material may comprise bloomery waste.

6.4 Statement of Potential

6.4.1 The assemblage is of low archaeological potential. No further work would be required.

7 ENVIRONMENT ASSESSMENT

7.1 Introduction

7.1.1 Four bulk samples were taken during the excavation on Area 11. A total weight of 44kg (23l) of sediment was processed for this stage of works. Further details for each sample can be found in Table 7.1.

7.1.2 This environmental assessment was undertaken by Lynne F. Gardiner.

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 7.1. 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. Tables 7.2. Once fully sorted and all relevant material removed the flots were discarded.

7.2.4 The four common palaeoenvironmental materials (namely plant remains, charcoal, shell and bone), along with magnetic matter, will be listed within the results section and where none were present this will be stated.

7.2.5 The plant remains identified to species as far as possible, using Jacomet (2006) and Cappers and Neef (2012). Nomenclature for cereals followed Cappers and Neef (2012).

7.2.6 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 clay dominated the samples' sediment matrix with one being silty sand sediments, further data can be observed in Table 7.1.

7.3.2 Flot and finds data is presented in Table 7.2.

7.3.3 Artefactual material recovered from the dried residues from **(11035) <11003>** and contained examples of charcoal, industrial waste and magnetised matter. This was the only sample that artefactual material was observed.

7.3.4 Although 1g of charcoal was recovered from **(11031) <11004>** it was sample **<11003>** from **(11035)** that was the most ecofactually yielding which corresponds with the observed artefacts from the samples. For the purposes of radiocarbon submission ivy (*Hedera helix*) was identified within the charcoal assemblage. Nine charred plant remains were recovered; they constituted fairly good examples of barley (*Hordeum* sp.) n=2, wheat (*Triticum* sp.) n=2 and two charred buds. Three indeterminate charred cereal grains were also observed. The 9.61g of charcoal presented was mostly abraded and silty fragments. The magnetised matter contained plate hammerscale.

7.3.5 No shell or bone was recovered from the environmental samples from this site.

7.4 Discussion

7.4.1 Overall the ecofactual assemblage was poor. Those items from **(11035) <11003>** were observed along with industrial waste which suggested the ecofactual remains are the result of rubbish disposal; maybe in part from industrial activity.

7.5 Statement of potential and recommendations

7.5.1 No further work is recommended on the ecofactual material as they offer no scope to add to existing knowledge.

7.5.2 *Radiocarbon suitability*: only the charred plant remains and charcoal from **(11035) <11003>** would be suitable.

7.5.3 *Retention and discard*: the charcoal and charred plant remains should be retained until all analytical work has been accomplished for Wylfa. Whilst this assemblage is not deemed suitable for further work it may be pertinent to further examine it if it relates to something in the wider landscape.

7.6 Acknowledgments

7.6.1 Freddie Sisson supervised the environmental team who consisted of Megan Lowrie and Katherine Bostock

Table 1: sample data

C	<>	TQ	Cut	Desc	MP	PW	PV	SW	SV
11007	11001	1	11006	burnt deposit? Fill of suspected pit	silty clay	5	2	889	625
11017	11002	1	11016	fill of cut. Interface	sandy clay	11	6	3130	2000
11035	11003	1	11034	fill of unknown feature	sandy clay	13	8	2375	1700
11031	11004	1	11030	fill of unknown feature	silty sand	15	7	3475	2100
						44	23		

Key: C=context, <>=sample number, TQ= number of tubs in sample, MP=matrix of pre-processed sediment, PW= weight (kg) of pre-processed sediment, PV= volume (l) of pre-processed sediment, SW= weight (g) of dried retent, SV= volume (ml) of dried retent

Table 2: flot and finds data

		Flots					Retent		
C	<>	WF	VF	CPR	EWC	Ch	Ch	IW	MM
11007	11001	0.9	5	-	-	-	-	-	-
11017	11002	8.4	15	-	-	-	-	-	-
11035	11003	48.4	85	9	3	0.61	9	5	5
11031	11004	2.9	15	-	-	-	1	-	-

Key: C= context, <>= sample number, WF= weight (g) of flot, VF= volume (ml) of flot, CPR= charred plant remains (quantity), EWC= earthworm capsules (quantity), Ch= charcoal (weight g), IW= industrial waste (g), MM= magnetised matter (weight g)

8 CONCLUSION

8.1 Interpretation

8.1.1 The archaeological excavation of Area 11 in the western part of Field L1(W), within the proposed development site of a new nuclear power station at Wylfa Newydd, Anglesey, allowed the investigation and recording of the archaeological potential revealed by the results of the archaeological evaluation, specifically Trench 2196. The excavation work largely re-excavated the evaluation findings and therefore the evaluation results have been included to allow for a more comprehensive discussion.

8.1.2 The remains were located in the southern half of Field L1(W) covering an area approximately 20m by 10m. The site is situated between Area 9 to the west (Wessex Archaeology 2018a), and Area 12 to the east (Wessex Archaeology 2018b), (Figure 2), and whereas Area 9 may be contemporary, Area 12 dates to the Early Medieval period.

8.1.3 The remains at Area 11 were found to be moderately complete, but had been truncated or affected vertically, so that the upper elements of the features were incomplete. In addition, survival had been influenced by the modern pipe trench running through the northeastern part of the site.

8.1.4 The archaeological remains in Area 11 demonstrate a relatively simple stratigraphic sequence, with all features sealed by the subsoil and truncating the natural substrate. The few features rarely intercut, although the evaluation results suggest a more complex picture. The data recovered during the excavation phase indicated two periods of past activity dating to the Late Iron Age and Industrial and Modern periods. For each Period present on the site there was only one or two observable phases of activity, but this may be oversimplified and the evaluation evidence suggests there may have been four phases. Several features were dated on the basis of spatial association and as such remain open to reinterpretation.

8.1.5 The archaeology comprised areas of depositional spreads that were likely to have been associated with a small number of pits, of which two could potentially have been postholes. There were also a number of less well-defined discrete features of probable natural origin.

8.1.6 The Late Iron Age to Early Roman features may have been part of an individual event of relatively short duration. Two radiocarbon dates have been obtained. One from the evaluation of 39 BC to AD 88 (Headland Archaeology 2017), and one from the post-excavation assessment of 155 BC-AD 52. There is a lack of visible settlement activity in

the immediate vicinity of Area 11, however discoveries at Area 9, 130m to the west, do demonstrate possible contemporary settlement (Wessex Archaeology 2018a). Therefore, Area 11 might represent outlying activity, such as agricultural practices, taking place at a specified point in the landscape rather than part of an occupation site, such as small-scale processing, gathering, modifying or temporary clearance. The restricted amount of material recovered from various fills indicated that there was discard of charred plant material, charcoal and marine molluscs (Headland 2017), although the small quantities may have derived from portable food rather than demonstrating a functional use of the features.

8.1.7 The assertion that industrial or metal working may have been an activity at Area 11 remains uncertain. The fired clay and industrial waste recovered are ambiguous. The fired clay may be natural material transformed as a result of its proximity to heating activities or dumped material, rather than representing the remains of deliberately formed linings or structural elements. The magnetised material seems to be a common component of the natural substrate and the 'industrial waste' requires confirmation.

8.1.8 The Industrial and Modern period and the natural / bioturbation features encountered in Area 11 relate to land improvement and drainage and are of little archaeological interest.

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 evidence of possible Late Iron Age activity encountered in Area 11 also forms part of the wider Late Iron Age/Roman landscape setting. Other elements of these remains are seen in nearby fields, including Area 9, Field F1.

8.2.2 The archaeological remains within Area 11 are of low regional significance and have limited potential to contribute to published research aims (CIfA Cymru/Wales 2003, 2011, 2017). The majority of features have not been independently dated which has reduced the value of the information. For the postulated Late Iron Age activity, the accumulating data is advancing an understanding of the forms, chronology, landscape setting, environmental context and function and range of such features.

8.2.3 Full analysis of data from Area 11 could be utilised to consider issues discussed more

widely, including what settled or other forms of occupation might have existed and how can they be recognized. Although small, and potentially of short duration, Area 11 can help to establish the type of activities and their dispersal through the landscape to set this, and other sites, into settlement hierarchies.

8.2.4 The artefactual and ecofactual remains recovered from Area 11 are not considered to be of any significance but do assist in identifying the date of discrete features often intangible within landscapes unless detailed analysis is carried out.

8.2.5 The very restricted data from the features and the environmental samples add to the overall picture of the local farming economy and the wider exploitation of the natural environment. There is very limited potential to assist in consideration of the exploitation of lakes, bogs and the sea.

8.2.6 The industrial activity at Area 11 currently remains undefined and ambiguous and has only a limited potential to better understand ore exploitation and industrial activity during the prehistoric periods.

8.3 Recommendations

8.3.1 The archaeological remains can expand on our understanding of the archaeology of the Isle of Anglesey regarding the regional research framework of Wales (CIfA Cymru/Wales 2017). To achieve this, the various datasets need to be combined and inserted 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 future digital deposition and public dissemination.

8.3.2 The results of the Area 11 archaeological excavation should be incorporated along with the results of wider Wylfa Newydd scheme and the results disseminated to interested parties and the 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 There is a need to fully integrate the evaluation and excavation results to maximise the data for interpretation and check hypotheses. There is a need to confirm the presence of industrial waste as this remains unverified.

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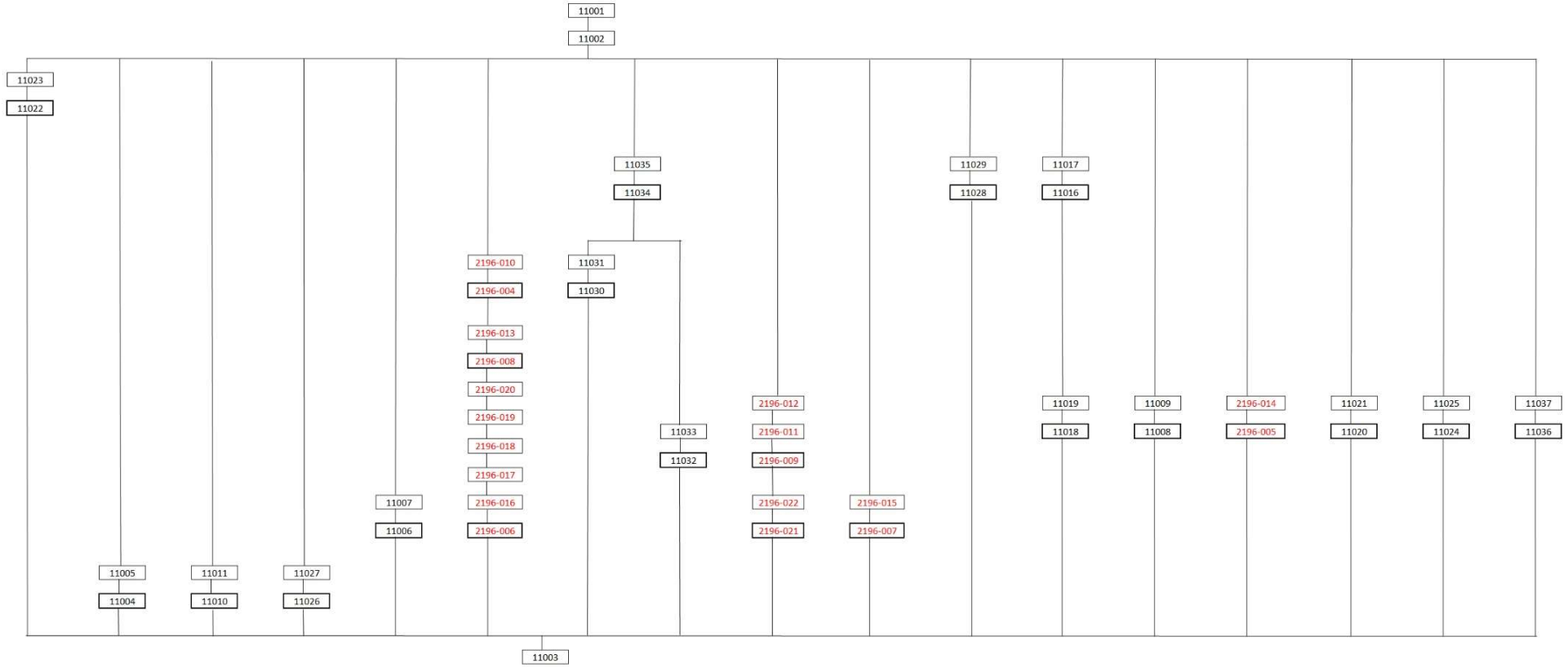
APPENDICES

APPENDIX 1: CONTEXT INDEX

Context Number	Context Type	Description	Width	Depth	Discussion
11001	Layer	Mid greyish-brown, silty clay with frequent gravel and pebbles	N/A	0.36 m	Topsoil
11002	Layer	Mid orangey-brown, loam with moderate gravel and pebbles	N/A	0.56 m	Subsoil
11003	Layer	Mid orangey-brown, clayey sand with frequent gravel and pebbles	N/A	0.92 m BGL	Natural substrate
11004	Cut	Irregular oval cut orientated N-S with steep straight sides and concave base	0.69m	0.13 m	Cut of bioturbation
11005	Fill	Loose light brown, sandy silt with rare small stones	0.69m	0.13 m	fill of bioturbation [11004]
11006	Cut	Irregular oval cut with sharp irregular sides and concave base	0.6m	0.08m	Cut uncertain feature
11007	Fill	Reddish-brown, sandy clay with moderate small angular stones and charcoal	0.6m	0.08m	fill of uncertain feature [11006]
11008	Cut	Oval cut with steep concave sides and flat base	0.95m	0.19m	Cut of pit
11009	Fill	Dark blackish-brown, silty sand with medium stones	0.95m	0.19m	fill of [11008]
11010	Cut	Oval cut orientated N-S with steep concave sides and flat base	0.5m	0.16m	Cut of bioturbation
11011	Fill	Reddish-orange, silty sand with rare small stones and charcoal	0.5m	0.12m	fill of bioturbation [11010]
11012	VOID	VOID		VOID	VOID
11013	VOID	VOID		VOID	VOID
11014	VOID	VOID		VOID	VOID
11015	VOID	VOID		VOID	VOID
11016	Cut	Irregular cut with gradual shallow sides and flat base	1m	0.20m	Cut of spread
11017	Fill	Black and grey, sandy silt with rare small sub-angular stones and charcoal	1m	0.20m	fill of spread [11016]
11018	Cut	Circular cut with steep straight sides and concave base	0.22m	0.13m	Cut of post-hole
11019	Fill	Mid brown, silty loam with rare angular stones		0.13m	fill of post-hole [11019]
11020	Cut	Sub-circular cut with steep concave sides and flat base	2.4m	0.25m	Cut of pit
11021	Fill	Hard, light yellowish-grey, clay with abundant gravels	2.4m	0.25m	fill of pit [11020]
11022	Cut	Linear cut NW-SE orientated with vertical straight sides	3.5m	1.40m	Cut of pipe trench
11023	Fill	Dark greyish-brown, sandy clay with abundant gravels, moderate cobbles and rare boulders	3.5m	1.40m	fill of pipe trench
11024	Cut	Circular cut with steep concave sides and flat base	0.58m	0.19m	Cut of pit or posthole
11025	Fill	Dark greyish-brown, silty clay	0.58m	0.19m	fill of pit [11024]
11026	Cut	Oval cut orientated N-S with irregular sides and concave base	1.77m	0.47m	Cut of bioturbation

Context Number	Context Type	Description	Width	Depth	Discussion
11027	Fill	Mid greyish-brown, sandy/silty loam with sparse sub-angular gravels and rare rounded to sub-angular cobbles	1.77m	0.47m	fill of bioturbation [11026]
11028	Cut	Sub-circular cut with gradual to steep concave sides and irregular base	0.47m	0.09m	Cut of interface
11029	Fill	Hard, light whitish-yellow clay with rare small stones	0.47m	0.09m	Fill of interface [11028}
11030	Cut	Irregular cut orientated ENE-WSW with steep irregular sides and flat base	0.75m	0.18m	Cut of pit
11031	Fill	Mid brown, silty clay with rare small sub-angular stones and charcoal	0.75m	0.18m	fill of pit [11032]
11032	Cut	Irregular cut orientated ENE-WSW with steep straight sides and concave base	0.66m	0.38m	Cut of pit
11033	Fill	Dark brown, silt with rare small sub-angular stones, rooting, and charcoal	0.66m	0.38m	fill of pit [11032]
11034	Cut	Irregular cut with shallow concave sides and flat base	>1m	0.20m	Cut of spread
11035	Fill	Dark blackish-brown, silt with rare rooting, small to medium angular stones, and charcoal	>1m	0.2m	fill of spread [11034]
11036	Fill	Oval cut orientated SW-NE with straight vertical sides and flat base	0.35m	0.37m	Cut of pit
11037	Cut	Moderate, mid brownish-grey, loamy clay with sparse sub-rounded to angular cobbles and moderate sub-angular gravels	0.35m	0.37m	fill of pit [11036]

APPENDIX 2: HARRIS MATRIX



APPENDIX 3: PLATES

Plate 1; Pre-excavation shot of Area L1(W), facing NW, 2m and 1m scale

Plate 2; Tree throw **[11026]**, facing SW, 2m scale

Plate 3; Posthole **[11018]** and spread **[11016]** / **(11017)**, facing E, 1m scale

Plate 4; Pit **[11030]**, facing SW, 1m scale

Plate 5; Feature **[11006]**, facing NE, 1m scale

Plate 6; Pit **[11032]**, facing SW, 1m scale

Plate 7; Post-excavation shot of slot through spread **[11034]** / **(11035)**, facing SW, 1m scale

Plate 8; General view of spread **(11035)** pre-excavation, facing NW, 2m scale

Plate 9; Feature **[11028]** / **(11029)**, facing NE, 1m scale

Plate 10; Pit **[11020]**, facing S, 1m scale

Plate 11; Pit **[11008]**, facing SE, 1m scale

Plate 12; Pit **[11024]**, facing SE, 1m scale

Plate 13; Pit **[11036]**, facing NE, 1m scale

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

Area 9 (F1)

Area 11 L1(w)

Area 12 L1(c)

Area 13 L1(e)

Area 14 (L1/L20)

Area 1 (L3/L4)

Penrhyn

Ffordd Y Traeth

Area 17 (L2)

Area 16 (K2)

Tormaen Cottage

Area 2 (L8/L12/L16)

Cemaes

High Street

Area 3 (K11)

Tyddyn-Goronwy

Area 5 (A1)

Felin Gafnan

Maen Y Bugail

Area 4 (E3)

Area 7 (A3)

Tyddyn Sydney

Swn Y Mor

Cafnan

Area 8 (A9)

Area 18 O6

Area 19 O5(n)

Tregele

EV9

Area 20 O5(s)

Ffordd 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

0 1km

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

CLIENT

Horizon Nuclear Power

PROJECT

Area 11,
Wylfa Newydd, Anglesey

DRAWING TITLE

Figure 1:
Wylfa Newydd development area and excavated sites

DRG No.	REV
CL12283-1101	A

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

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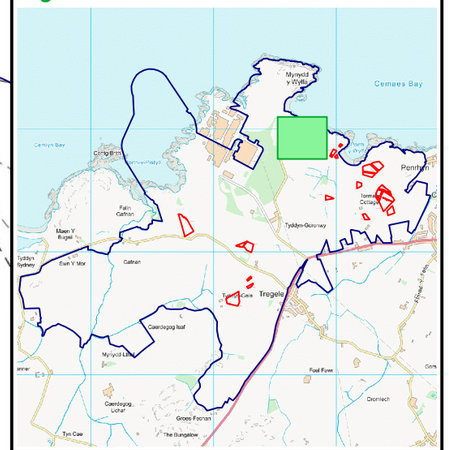
Wylfa Newydd development area

Excavation area

Excavation areas in vicinity

Figure location:



Coastal Slope

Rock

Area 11 L1(w)

Area 9 (F1)

Area 12 L1(c)

Path (um)

Post

Track

Car Park

Pond

Path (um)

235575/393800

235875/393800

0

100m

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

CLIENT

Horizon Nuclear Power

PROJECT

Area 11,
Wylfa Newydd, Anglesey

DRAWING TITLE

Figure 2:
Detailed site location

DRG No.	REV
CL12283-1102	A

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

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DO NOT SCALE FROM THIS DRAWING

Trench 2196

natural (11003)

[11022]

s.11005

[11020]

s.11001

[11004]

s.11011 [11036]

s.11002

[11006]

[11024]

[11028]

s.11008

[11034]

s.11006

[11032]

[11010]

s.11003

[11026]

s.11007

s.11010

s.11004

[11018]

[11008]

[11030]

s.11009

s.11012

[11016]

natural (11003)

Trench 2197

0 10m

(11000) Context numbers

Section location

Limit of excavation

Excavated area

Period 0 Natural

Period 3 Late Bronze Age and Iron Age 1500 BC – AD 43

Period 8 Industrial and Modern AD 1750 – present

Spread

Trench location

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

CLIENT

Horizon Nuclear Power

PROJECT

Area 11,
Wylfa Newydd, Anglesey

DRAWING TITLE

Figure 3:
Area 11; detailed plan

DRG No.	REV
CL12283-1103	A

DRG SIZE	SCALE	DATE
A3	1:125	Feb 2020

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VT/HP	FG	FG

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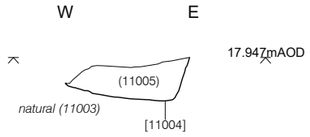
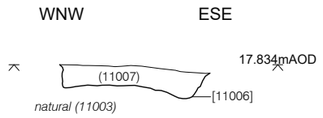
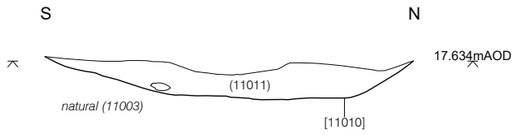


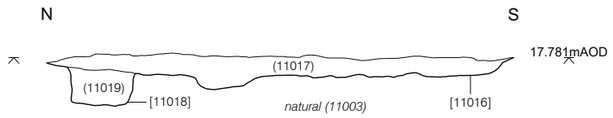
Section 11001. South facing section across feature [11004].



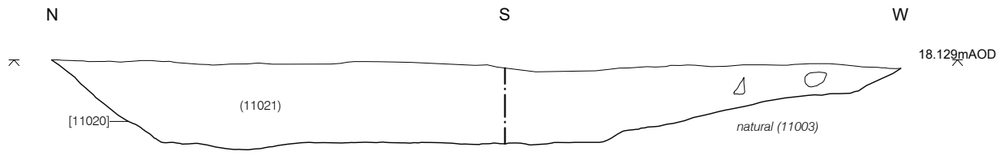
Section 11002. SSW facing section across feature [11006].



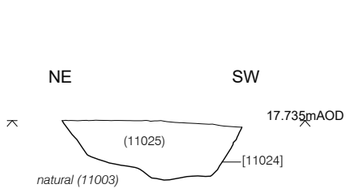
Section 11003. East facing section across feature [11010].



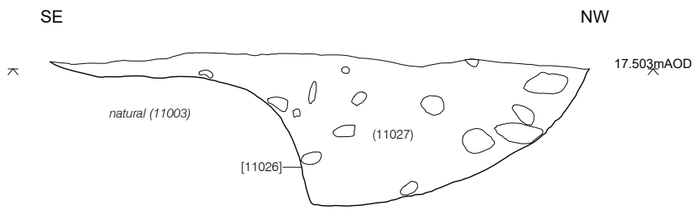
Section 11004. West facing section across feature [11016] and posthole [11018].



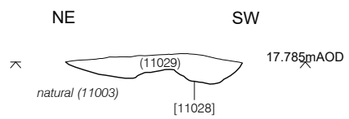
Section 11005. West and north facing section across pit [11020].



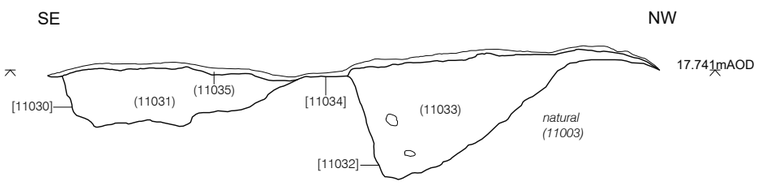
Section 11006. North-west facing section across pit [11024].



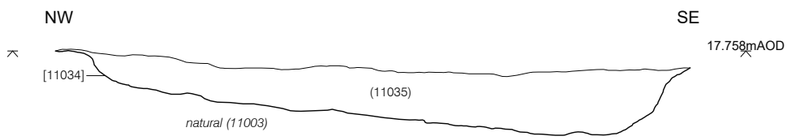
Section 11007. North-east facing section across feature [11026].



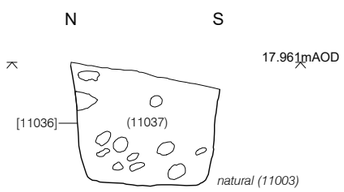
Section 11008. North-west facing section across feature [11028].



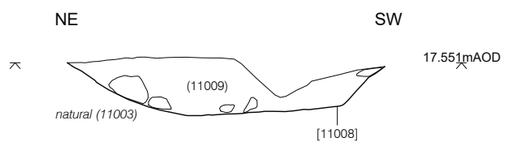
Section 11009. North-east facing section across features [11030] and [11032].



Section 11010. South-west facing section across feature [11034]



Section 11011. West facing section across pit [11036].



Section 11012. North-west facing section across pit [11008].

0 2m

DO NOT SCALE FROM THIS DRAWING

(11000) Context numbers

Limit of excavation

Height mAOD

Stones

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

CLIENT

Horizon Nuclear Power

PROJECT

Area 11,
Wylfa Newydd,
Anglesey

DRAWING TITLE

Figure 4:
Area 11; sections

DRG No.		REV
CL12283-1104		A
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A3	1:20	Feb 2020
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APPENDIX 5: RADIOCARBON CERTIFICATE

BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

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

(Variables: d13C = -26.5 o/oo)

Laboratory number **Beta-554952**

Conventional radiocarbon age **2030 ± 30 BP**

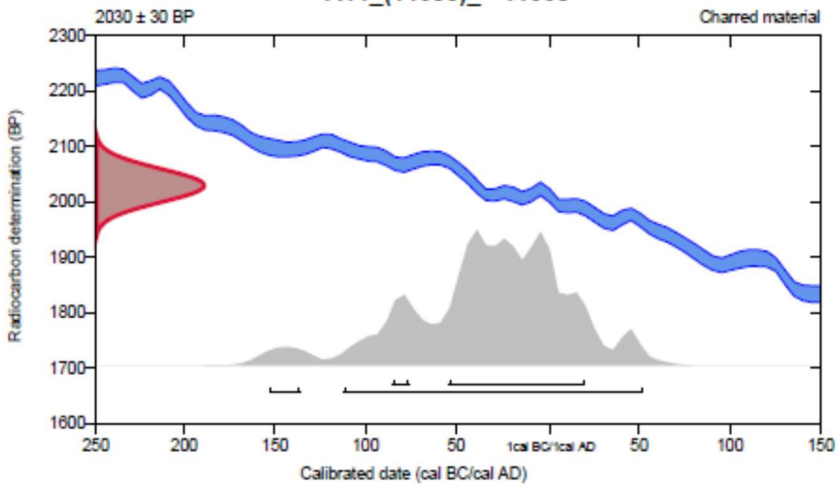
95.4% probability

(92.9%)	114 cal BC - 52 cal AD	(2063 - 1898 cal BP)
(2.5%)	155 - 138 cal BC	(2104 - 2087 cal BP)

68.2% probability

(63.1%)	56 cal BC - 20 cal AD	(2005 - 1930 cal BP)
(5.1%)	87 - 78 cal BC	(2036 - 2027 cal BP)

A11_(11035)_< 11003 >



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 11

Feature	*Date*	*Description*	*easting,northing*
Outlying non occupational activity site	Late Iron Age to early Roman	Several discrete features including a post hole, some pits and two ambiguous features, grain from one pit returning a radiocarbon date of the Late Iron Age to Early Roman period, and two shallow features, possible spreads of trample or work areas, grain from one of which also returned a Late Iron to Early Roman date, with four associated discrete pits, suggest some kind of short-lived possible processing site or agricultural processing site	235728,393922

APPENDIX 7: POST-EXCAVATION ASSESSMENT METHOD STATEMENT

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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

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Telephone: +44 (0)1228 550575 www.wardell-armstrong.com

DATE ISSUED: April 2019

JOB NUMBER: **CL12271**

PREPARED BY:

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APPROVED BY:

Frank Giecco	Technical Director	

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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.

Stage 4 PXA and UPD Reporting

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.

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