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HORIZON NUCLEAR POWER

WYLFA NEWYDD, ANGLESEY

AREA 12, ARCHAEOLOGICAL POST-EXCAVATION ASSESSMENT REPORT

DECEMBER 2021

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HORIZON NUCLEAR POWER

WYLFA NEWYDD, ANGLESEY

AREA 12, 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 12, which was undertaken in accordance with a Written Scheme of Investigation (WSI) (Horizon Nuclear Power (HNP) 2015), the Technical Update (HNP 2017a) and Community Dig Scope (HNP 2017b). All documents were agreed with Gwynedd Archaeological Planning Services, the archaeological planning advisors to the Isle of Anglesey County Council.

Area 12 was located within a single field, Field L1, centred on NGR SH 235850 393900 and the excavation covered an area of 367m^2. The archaeological work was undertaken between 9th and 31st August 2017.

The excavation encountered three phases of archaeological features: a ditch was cut by a penannular gully, and both these features were cut by a large pit. Grain from the pit feature, and from another discrete pit, returned radiocarbon dates of the 7th/8th century AD. While the penannular gully and ditch could date to Iron Age/Romano British settlement, known from close by within Area 15, these features are thought most likely to also date to the Early medieval period and relate to the cemetery evidence of the same date recorded within Area 15.

CRYNODEB

Comisiynwyd Wardell Armstrong LLP (WA) gan Horizon Nuclear Power i gyflawni asesiad ol-gloddio archaeolegol ar gyfer cloddfau archaeolegol ar safle arfaethedig gorsaf bŵer niwclear Wylfa Newydd, Ynys Môn, Cymru, wedi ei ganoli ar Cyfeirnod Grid Cenedlaethol (NGR): SH 36350 93450. Ymgymerwyd ar y rhaglen waith maes archaeolegol i gefnogi cais Orchymyn Cydsyniad Datblygu (EN010007). Rhannwyd y rhaglen gwaith maes i lecynnau diffiniol ac mae'r adroddiad hwn yn manylu canlyniadau cloddfa archaeolegol yn Area 12.

Roedd Area 12 yn cynnwys un llecyn, yng nghae L1, wedi ei ganoli ar NGR SH 235850 393900 ac yn mesur 367m². Cwblhawyd y gwaith maes archaeolegol rhwng yr 9fed a'r 31ain o Awst 2017.

Darganfyddwyd nodweddion archaeolegol sy'n debygol o gynrychioli dau gyfnod cyffredinol o weithgaredd yn Area 12. Y cynharaf oedd ffos fwlchgron dehonglwyd fel rhigol ddiferu tŷ

crwn sy'n debygol o ddyddio i'r Oes Haearn. Cynrychiolwyd yr ail gyfnod gan nodweddion allai gynrychioli odyn sychu grawn, mae dyddiadau radiocarbon o rawn llosg yn dangos bod y nodweddion yn dyddio i'r cyfnod canoloesol cynnar.

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 also at CADW (formerly of Gwynedd Archaeological Planning Service (GAPS), and Jenny Emmett, Senior Planning Archaeologist at Gwynedd Archaeological Planning Service. Thanks go also to Headland Archaeology who carried out the evaluation and 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 Hayley Graham assisted by Vix Hughes. The figures were produced by Helen Phillips and Valeria Tiezzi. The animal bone was assessed by Megan Stoakley, lithic artefacts were assessed by Miguel Gonzalez and the assessment report was compiled by Sue Thompson. Freddie Sisson supervised the environmental team who consisted of Megan Lowrie, Katherine Bostock and Jyoti Stuart; he also wrote the palaeoenvironmental assessment which was edited by Lynne F. Gardiner. The project was managed by Frank Giecco and Damion Churchill, 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 12, Field L1 (central part) at Wylfa Newydd, Anglesey, Wales, centred on National Grid Reference (NGR): SH 36000 93800 (Figure 1). This excavation was one of multiple defined areas excavated as part of a large scheme of works commissioned by the Horizon Nuclear Power (HNP). The intention is 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 (HER) event numbers ('PRNs') were assigned following discussions between Wessex Archaeology and Nina Steele, Senior Historic Environment Record Archaeologist at Gwynedd Archaeological Trust (GAT). PRN45392 has been assigned to the Wylfa Newydd project as a whole and further event numbers have also been assigned to 'noteworthy components' of the project. Those assigned to features within Area 12 are presented in Table 1.1.

Table 1.1: Primary Reference Numbers (PRNs) for Area 12

PRN number	Description	Associated context numbers/PRNs
PRN76018	Penannular ditch, Late Bronze Age to Iron Age	n/a
PRN91994	Ditch, early medieval	n/a
PRN76017	Possible kiln, early medieval	n/a
PRN91996	Posthole, early medieval	[12031]
PRN91997	Pit, early medieval	[12048]
PRN91998	Ditch, uncertain date	n/a

1.3 Project Documentation

1.3.1 The project conforms to a brief prepared by HNP which was prepared in consultation with the Gwynedd Archaeological Planning Service (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 fieldwork undertaken on site at Area 12, the results of this scheme of archaeological excavation and the subsequent programme of post-excavation assessment.

1.3.3 The excavation of Area 12 was undertaken between 9th and 31st August 2017, in Field L1(c), (Figure 2). The 367m^2 area of investigation targeted features encountered during the archaeological evaluation phase.

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).

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) and the *Standard and guidance for the collection, documentation, conservation and research of archaeological materials* (CIfA 2014b).

2.2 Archaeological Excavation

2.2.1 The excavation comprised the strip map and sample of an area measuring 16.7m by 22m, totalling an area of 367m^2, situated in Field L1(c) in the northeastern part of the proposed development area. Defined areas were identified for archaeological excavation from previous geophysical survey and trial trench evaluation.

2.3 Aims and objectives

2.3.1 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;*
- *to undertake the works in such a way as to allow sufficient data to be gathered to address the various research objectives outlined below. This includes the investigation and recording of features, the identification, recording and collection of artefacts and ecofacts (including environmental samples) and the use of appropriate analytical methodologies / techniques when examining the record / artefacts.*

And, specifically for the Area 12 excavation:

- *To address archaeological research objectives posed by the Research Framework for the Archaeology of Wales (CIfA Cymru/Wales 2017).*
- *Gain confirmation of the date, nature, character and extent of potential medieval and prehistoric sites in an order that can be placed into the wider context of Anglesey during these periods. There is particular emphasis on obtaining accurate C14 dates in order that the chronology of sites and ceramic sequences can ascertained.*
- *To undertake detailed analysis of (early) medieval artefacts and their contexts in order to understand the chronological and typographic development, and use, of the artefacts.*
- *Gain insight into the chronology and process of Christian conversion and the broader impact of this on the landscape of (early) medieval society in Wales.*
- *Identify, in so far as is possible, the settlement and ecclesiastical sites associated with cemetery sites in order to understand the interrelationships between settlement sites, parish catchment areas and cemetery catchment areas.*
- *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.*
- *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.*
- *Establish the extent of continuity or discontinuity between the late Roman and Early medieval periods via analysis of environmental evidence, the agricultural economy, artefacts recovered, changes in settlement patterns and trade.*
- *Understand how the transition between the Late Roman and Early medieval period on Anglesey compares with the same period elsewhere in Wales and Britain.*
- *Understand what, if any, impact Irish and Scandinavian populations had on (early) medieval Wales (artefacts, agricultural economy, etc).*
- *Gain insights into social organisation and settlement hierarchies.*
- *Identify and understanding early field systems.*
- *Develop our understanding of known, but poorly understood, monument types - such as burnt mounds.*
- *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. It is notable that two large stone outcrops are present within Field L1 and there is some evidence that these have been quarried in the past.*

2.3.2 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).

2.3.3 A number of the features had previously been identified during the 2017 Headland evaluation and in these 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.

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

2.3.5 All finds encountered were retained on site and returned to the Wardell Armstrong (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 1998). 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.

2.3.6 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 summary where applicable.

2.3.7 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 are 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

3.1.1 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, with copies of the report sent to the Gwynedd Archaeological Trust HER, available upon request. The archive can be accessed under the unique project identifier WA19/CL12283/Area 12/35-2016.

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

Category	Quantification
Context Sheets	50
Small finds	0
Bulk finds	520g
Environmental samples	5 samples (88 l)
Monochrome film	0
Digital photographs	67
Rectified photographs	0
Hand drawn plans	1
Hand drawn sections	13
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 The proposed development site is located on the north Anglesey coast approximately 2km west of the village of Cemaes (Figure 1). The nearest village is Tregele, approximately 1km to the south-east.

4.1.2 Area 12 was in a field designated as L1 during the evaluation phase, and Field L1(C) at the excavation phase, and lay within the northeastern part of the proposed development area (centred on NGR: 235850 393900). Area 12 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*. 18m aOD (above Ordnance Datum) with the ground sloping down gently to the northwest.

4.1.3 Area 12 is approximately 367m^2 in size and is rectangular in shape. At the time of excavation, Area 12 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 clay sand with frequent gravel and pebble inclusions 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) and was reviewed and updated later (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 12. 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 12. The earliest known activity on

Anglesey is in the form of Mesolithic flint scatters located close to the coast, south of the proposed development area (GAT 2012b).

4.2.3 ***Period 2 – Neolithic and Early Bronze Age (4000 – 1500 BC):*** There is no previously known Neolithic or Early Bronze Age activity within Area 12. 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.

4.2.4 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.

4.2.5 Few Bronze Age settlements have been identified on Anglesey. A number of the undated enclosures on Anglesey may date to the late prehistoric period, such as the cropmark feature found to the north of Llanfechell, located 1.4km southeast of the Wylfa Newydd Development Area.

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*). Similar remains were encountered during the evaluation phase in nearby Fields K1, K4 and C15, 570m to the southwest. 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, to the east of Area 12, in the form of an unusual, coastal burnt mound (Wessex 2016).

4.2.7 ***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 12.

4.2.8 Evidence for activity of this period on Anglesey comes from hillforts, small enclosed settlement sites (roundhouses, fields etc), 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 at Dinas Gynfor is located almost 3km northeast of the Wylfa Newydd Development Area.

4.2.9 Evidence of small enclosed settlement sites, consisting of a single or a cluster of roundhouses, hut sites, rectilinear enclosures and concentric enclosures which are

sometimes palisaded are also located around Anglesey (Cuttler *et al.* 2012). These likely date to the late Iron Age and Romano-British (AD43-410) periods (*ibid.*). Examples of known sites include farmsteads found at Cefn Du, Cefn Cwmwd and Melin y Plas which was discovered during the A55 archaeological works (*ibid.*).

4.2.10 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 2016).

4.2.11 ***Period 4 – Roman (AD 43 – 410):*** There is no known Roman activity within Area 12. 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. Late Iron age to Roman activity was encountered nearby in Area 9 Field F1 where a small occupation site, focused on utilising marine resources, was found.

4.2.12 ***Period 5 - Early medieval (AD 410 – 1100):*** There is no previously known Early medieval activity within Area 12. A highly significant Early medieval cemetery has, however, been excavated as part of the project within Area 15, 50m south-west of Area 12 (Headland 2017, 15-18).

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

4.2.14 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.*).

4.2.15 Other evidence comes from occasional findspots which include inscribed stones and a rare small fortified site at Porth Wen may have related to Viking raids of the 9th century.

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

4.2.17 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*).

4.2.18 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*).

4.2.19 Archaeological evidence indicates that the practice of open-field farming, with 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 (Jacobs 2015).

4.2.20 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.

4.2.21 To the southeast, in Fields L2 (Area 17) and L4 (Area 1) several trenches revealed the presence of several ditches which corresponded to surveyed geophysical anomalies and others that were not. The dates and relationships are uncertain, those within Area 17 are thought to be medieval, but they form functional boundaries within the landscape.

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

4.2.1 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.

4.2.2 ***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.

4.2.3 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.

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

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

4.2.6 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.

4.2.7 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.

4.2.8 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 also prepared by Jacobs (2015) to support the DCO application.

4.3.2 For Area 12 the results did not suggest any specific archaeological potential other than agricultural remains such as field boundary ditches and ancient field systems. There are indications that the area, known as Tre'r Gof 'township of the smith', may have originated as an early medieval township or hamlet which no longer survives. In addition, the church of Llanbadrig, 2km to the northeast may be associated with this location and there are documents related to the township from the 12th century.

4.3.3 ***Geophysical Survey***: No specific potential archaeological features, other than the buried remains of former field boundaries, were identified during the geophysical survey (GAT 2011a, 2011b and 2012).

4.3.4 ***Archaeological Evaluation:*** Evaluation trial trenching took place in 2016 (Headland 2018) where a total of 452 trenches were excavated, 84 of those were in Field L1. One northeast-southwest orientated Trench, 2133, crossed Area 12 and contained a large pit [2133-004]. Its full extent extended beyond the limit of excavation, but the exposed portion measured 2.7m in width and 1.1m in depth.

4.3.5 It was located at the base of a large rock outcrop and had a steep sided broadly bowl shaped stepped profile. At the very base of the cut, below the level of the step, was a dark grey deposit of very fine grained silt (2133-005) sealed by a thin (0.08m thick) layer of clean yellowish silty sand (2133-006). A much more substantial, 0.20m thick, deposit of mid-dark grey sandy silt with numerous charcoal flecks (2133-007) filled the remainder of the feature up to the level of the step in the pits profile. Where the feature began to broaden, toward its surface two further sterile deposits (2133-008) and (2133-009) were recorded. Each of these final layers appeared to have been deposited naturally after the feature had fallen into disuse (Headland 2017).

4.3.6 The highly concentrated charcoal and the unusual layering of clean sand observed toward the base of the pit suggest that it may have been used as part of a localised

industrial process. Radiocarbon dates from charred cereal grain recovered from the feature returned dates of between 1356 +/- 27 and 1392 +/- 29 Cal BP (Headland 2017), which equates to date ranges of cal AD 631-763 and cal AD 603-671 (IntCal 13).

5 ARCHAEOLOGICAL EXCAVATION RESULTS

5.1 Introduction

5.1.1 The excavation of Area 12 was undertaken between 9th and 31st August 2017, in Field L1(c), (Figure 2). Area 12 was designed to target a large pit recorded during the evaluation trial trenching phase. The pit was identified as having a possible industrial use with abundant charcoal and ecofactual material in its basal fill and therefore required full excavation to confirm the feature's origins and past use.

5.2 Results

5.2.1 Area 12 measured 22m in length and 16.7m in width. It was excavated to a maximum depth of 0.9m. The geological substrate **(12003)** consisted of mid-orange brown clay sand with frequent gravel and pebble inclusions and was overlain by a 0.5m thick deposit of mid-orange brown loam subsoil which also contained frequent gravel and pebble inclusions **(12002)**. The site was sealed by a mid-grey brown silty clay topsoil **(12001)** with an average depth of 0.4m.

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

Undated (Period 5 - Early medieval?)

Phase 1

5.2.3 The earliest feature on the site was a northwest-southeast aligned ditch **[12008**=**12025**=**12027]** (PRN91994, Figure 3 & Plate 5). The ditch measured over 7m in length. In plan, it extended southeast beyond the limit of excavation. The ditch had a maximum width of 0.8m and was up to 0.6m deep. The sides were straight and steep and tapered to a flat base (Section 12010). Large stones that may once have formed a lining were observed throughout the length of the ditch within the dark greyish brown silty sand **(12009**, **12026**, **12028)** (Plate 6). A single chert debitage flake was recovered from fill **(12009)**.

Phase 2

5.2.4 Sections 12011a and 12002 (Figure 4) both demonstrate that the ditch was cut by a penannular gully (PRN76018). The penannular gully covered an area of 5.7m by 4.4m in plan, with a 0.30m break on its northern edge. Aside from its stratigraphic position, there was no independent means of dating the feature.

5.2.5 A total of five interventions **[12004=12006=12010=12014-12029]** were excavated along the length of the ditch (Figure 3 & Figure 4 sections 12001b, 12002, 12003, 12005A & B, 12006, 12011A). The ditch had gradually sloping sides and a concave base (Plates 1 and 2). The ditch had a width of 0.75m at each of the termini **[12004]** and **[12014]** where it also had concave sides and base and was between 0.18m and 0.22m in depth. Around the rest of the extent the width varied between 0.4m and 0.95m. The profile also varied between that seen at the termini and the much steeper, straight sides and flat base, observed in the circumference interventions.

5.2.6 The ditch contained two fills, a lower mid-reddish brown silty sand **(12012, 12013 and 12016**) and an upper mid-greyish brown silty sand **(12005, 12007 and 12015)**. The only artefact recovered was a piece of flint flake consistent with a prehistoric date, but this may be residual.

Period 5 - Early medieval (radiocarbon dated)

Phase 3

5.2.7 Both the terminus of the Phase 1 ditch and the western edge of the Phase 2 penannular gully were cut by a large pit **[12019=12047]** (Figure 3). This pit was identified as [**2133-004**] recorded by Headland Archaeology during their evaluation. Headland recorded eight fills. Two radiocarbon dates from charred cereal grain recovered during the evaluation from pit [**2133-004**] returned dates of between 1356 +/- 27 and 1392 +/- 29 Cal BP (Headland 2017), which equates to date ranges of cal AD 631-763 and cal AD 603-671 (IntCal 13), early medieval, and in keeping with the date range of AD 652-768, produced by charred barley grain sampled during the excavation phase from the lowest fill.

5.2.8 During the excavation, the pit was roughly ovoid in plan and measured 3.1m by 2.4m. Excavation demonstrated its surviving depth as 1.1m (Plate 4), PRN91995. The profile of the pit was broadly bowl shaped with relatively steep sides narrowing to a slight step, toward its base (Figure 5 sections 12008 & 12012). It should be noted that the pit fill contexts **(12020-12024)** for cut **[12019]** were not recorded on site. This feature has been tentatively identified as a grain dryer.

5.2.9 At the very base of the cut, below the level of the step, were several thin deposits. At the base was a 0.04m thick layer of black loamy sand containing charcoal and wood fragments **(12046)** which probably equates to **(12020)**. When sampled, **(12046)** produced charcoal and wheat grains amongst the partially charred plant remains. A

barley grain from **<12006>** from **(12046)** provided a radiocarbon calibrated date range of AD 652-768 (*confer* 6.7). Lower fill **(12046)** was sealed by a 0.03m thick deposit of reddish yellow sandy loam **(12045)** which probably equates to **(12021)**, overlain by a very thin 0.01m deposit of mid-greyish yellow sandy loam **(12044)** which contained infrequent, small animal bone fragments. Above this was a 0.2m thick layer of light greyish yellow sandy loam **(12043)** which contained frequent angular stones up to 0.10m in size.

5.2.10 Overlying **(12043)**, and only present on the northeast side of the pit, was a naturally deposited fill of dark reddish-brown silty sand **(12042)**. The deposit was comprised of 50% angular stones, up to 0.10m in size, within a matrix of mid brown loamy sand. The nature of **(12042)** was ambiguous and the stones may have been a form of rough inner surface, part of a collapsed superstructure or deliberate dismantling and backfill. At the north end, the remains of what was a possible stone lining around the top edge of the pit was recorded **{12050}**. It comprised several roughly faced angular stones up to 0.25m in width. The stones appeared to be seal deposit **(12042)**. However, it is perhaps more likely that they were part of the original structure of the pit and, because of their limited number, were stratigraphically out of sequence during on site recording, with **(12042)** being deposited after **{12050}**. Above and adjacent to **{12050}** a deposit of greyish brown sandy loam **(12041)** also contained fragments of stone similar to those of **{12050}**.

5.2.11 A further two backfilling events consisted of a deposit of mid-greyish brown sandy loam **(12039)**. It had a thickness of 0.43m and was only present in the north end of the pit with a diameter in plan of *c.* 1m. This was sealed by a final deposit of light greyish brown loamy sand (**12037**) observed across the north half of the pit. Both these upper fills contained fragments of angular stones. Both these backfilling events were issued cut numbers **[12038]** and **[12040]** respectively, however it is unclear if these events were filling actual late re-cuts of pit **[12047]** or been the two final phases of backfilling.

5.2.12 Another pit **[12048]**, PRN91997, located within penannular ditch **[12004]** was also dated to the 7th/8th century AD (Figure 3). The pit was sub-circular in plan and measured *c*. 0.85m in diameter. It was filled by a single deposit **(12049)**, which when sampled produced a small flint fragment, charcoal and wheat grains amongst the charred plant remains. A barley grain from **<12003>** from **(12049)** provided a radiocarbon calibrated date range of AD 637-765 (*confer* 6.7), and it is this evidence which has resulted in these features being tentatively placed within site Phase 3.

Undated features

5.2.13 Post hole **[12031]**, PRN91996 (Figure 3, Plate 3, Figure 5 section 12011B), was located on the southwest side of the area enclosed by ditch **[12004]** and measured 0.1m in diameter and 0.07m deep, with straight, steep sides tapering to a V-shaped base. It was filled by a deposit of dark greyish brown loamy sand **(12032)** that contained a few angular stones that were possibly used for post packing.

5.2.14 A further ditch was encountered to the south-west of the other features, not directly connected to the other remains (Figure 3), PRN91998. Three sections of this ditch **[12017**=**12033**=**12035]** were investigated (Figure 5 sections 12007A to 12007C & Plate 7). It extended over 7.75m from the northeast terminus **[12035]**, to the southwest and beyond the limit of excavation. It was approximately 0.4m wide by 0.18m deep but was smaller at the less well-defined terminus. The single fill **(12018**, **12034**, **12036)** was a mid-greyish brown sand, but produced no artefactual material. The ambiguity of the feature means that it may have been a shallow ditch or possibly a hedge line or a worn linear depression.

6 FINDS ASSESSMENT

6.1 Introduction and Methodology

6.1.1 A total of eight artefacts, weighing 520g, were recovered from five contexts on an archaeological investigation at Area 12. The finds were in good condition. The finds assemblage was transferred to Carlisle and assessed by Wardell Armstrong.

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

6.1.3 Quantification of bulk finds by material and context is given in Table 6.1 and lithics quantification in Table 6.2. Quantification of finds recovered from the environmental samples is given in Table 6.3.

Context	Material	Quantity	Weight (g)	Period / Date	Comments
12009	Lithic	1	9	Prehistoric	Chert
12013	Lithic	1	6	Prehistoric	Flint
12044	Animal Bone	4	1	-	Limb bones, small mammal
12041	Stone	1	283	Prehistoric – Roman?	Sandstone pebble
12049	Lithic	1	1	Prehistoric residual	Flint
Total		**8**	**520**		

Table 6.1 Quantification of bulk finds (this does not include lithic small finds, nor finds from samples)

6.2 Lithics

6.2.1 The assemblage recovered from Area 12 comprised three (16.07g) worked lithics. The lithics have been rapidly assessed, quantified and individually assigned to a broad category according to debitage, core or tool type with a further distinction made using sub-category field.

6.2.2 The condition of the assemblage is good, with no signs of re-cortication displaying only some degree of edge damage. It comprised: a soft hammer, tertiary flake of black fine chert **(12009)**; an unclassifiable flint flake core fragment **(12013)**; and a small flint chip **(12049)**.

6.2.3 The assemblage is potentially residual and chronologically mixed and there is

variability in the condition and technological traits of individual pieces.

Context no.	Raw Material							Dimensions				Class	Category	Subcategory
	Type	Colour	Lustre	Texture	Opacity	Cortex	Patination	L	W	T	Wgt			
12009	Chert	Black	Dull	Medium	Opaque	Nco	None	27.8	39.7	10	8.67	Debitage	Flake	Tertiary flake
12013	Flint	Grey	Shiny	Fine	Opaque	NcoD	None	28.7	17.8	12.3	5.92	Core	Core fragment	Unclassifiable flake core
12049	Flint	Grey	Shiny	Fine	Opaque	NcoD	Medium	13	18.7	4.4	1.48	Debitage	Chip	Chip

Table 6.2 Lithics quantification Key: Nco=no cortex present; L=length /mm; W=width /mm; T=thickness /mm; Wgt=weight /g

6.3 Stone

6.3.1 A single stone artefact weighing 283g was recovered from context **(12041)** and was in good condition.

6.3.2 The stone comprised a flattish rounded sandstone pebble measuring 80mm x 70mm and was similar to artefacts recovered during the A55 road scheme as likely rubbers or small grinding stones (Smith 2012, 161-164). It is difficult to assign a close date to this type of find; the worked stone artefacts recovered from the A55 road scheme, including the rubbers and whetstones, were given a general date of Late Iron Age to Roman and the sandstone pebble recovered from Area 12 may be of a similar date. The worked stone objects were recovered from roundhouse features S1 and S2, which were located in Field A30, which is situated at the eastern extent of the corridor route near Cefn Du, Gaerwen (Cuttler 2012, 11). Comparison of the Area 12 stone artefact with the worked stone recovered from the A55 road scheme was made due to similarities in their appearance and dimensions.

6.4 Animal Bone

6.4.1 Four tiny fragments of bone with a combined weight of 1g were recovered from context **(12044)**. The bone is in very poor condition and comprises highly fragmentary limb bones, possibly from a small mammal.

6.5 Finds from Environmental Samples

6.5.1 A total of 6g of finds comprising bone and possible industrial waste were recovered from four environmental samples. (Table 6.3). The finds are generally small in size, very abraded and highly fragmented. While they need to be considered alongside the bulk finds assemblage, a separate data set is appropriate for the finds from environmental samples, as it represents a separate recovery and quantification strategy for the retrieval of finds.

Context	Sample	Material	Weight (g)	Period / Date	Comments
12049	12003	Industrial Waste?	1	Early medieval	Fuel ash
12041	12004	Industrial Waste?	1	Unknown	Fuel ash?
12044	12005	Animal Bone	2	Unknown	MNI 2 individuals – includes avian species & rodent bones & teeth
12044	12005	Industrial Waste	1	Unknown	Fuel ash?
12046	12006	Industrial Waste	1	Unknown	Fuel ash?
Total			**6**		

Table 6.3 Quantification of finds from environmental samples

6.5.2 *Bone*: A further 2g of animal bone was recovered from **(12044)**, sample <12005>. A minimum number of two individuals are represented here, comprising limb bones from an avian species (possibly wild?) and also limb bones and teeth from a rodent species, possibly a mouse.

6.5.3 *Industrial Waste*: A total of 4g of slag/clinker were recovered from four environmental samples. The fragments are very small and lightweight and may represent vitrified fuel ash rather than industrial activity (Historic England 2015) and were insignificant in such small quantities.

7 PALAEOENVIRONMENTAL ASSESSMENT

7.1 Introduction

7.1.1 Five bulk samples were taken during the excavation on Area 12. A total weight of 154kg (88l) 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 Freddie Sisson.

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. Table 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 Methodology employed for the treatment of the samples is fully expanded upon in the Wardell Armstrong LLP Technical Manual No 2. (2018) and determined by Wardell Armstrong (2019).

7.3 Results

7.3.1 Sandy silt and silty sand dominated the samples' sediment matrix 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 were minimal but contained examples of industrial waste.

7.3.4 CPR: Charred plant remains (CPR) were present in all five samples and were in relatively good condition. From these, three samples yielded assemblages of over 50 cereal grains which were: **(12080) <12002>** from the secondary fill of ditch terminus **[12002]**, **(12049) <12003>** and **(12046) <12006>** both from the fill of ditch **[12047]**. Most of the cereal grains were identified as wheat (*Triticum* sp.).

7.3.5 CHARCOAL: Charcoal was recovered from all five samples and was in relatively good condition. From these two samples yielded more than 5g which were **(12049) <12003>** and **(12046) <12006>** both from the fill of pit **[12047]**.

7.3.6 SHELL: No shell was recovered from Area 12.

7.3.7 BONE: Small bone fragments were present in one sample which was **(12044) <12005>** from pit fill **[12047]** and weighed a total of 1g.

7.3.8 MAGNETIC MATTER: Magnetised material was present in three samples and was examined for microslags under a microscope (x45 magnification). No microslags were present with the material being entirely comprised of small naturally magnetic stone.

7.4 Discussion

7.4.1 Due to the location of the CPR and charcoal it is difficult to have any meaningful discussion. The material was recovered from either pit or ditch fills. Thus, the material was being discarded into pits.

7.4.2 The CPR were identified as wheat which would link in with crop husbandry practices seen across Anglesey such as at Cefn Du (Ciaraldi in Cuttler et al, 2012). This shows that wheat was one of the regular crop types being produced in the area as we have also seen wheat found at other excavations across the Wylfa site.

7.5 Statement of potential and recommendations

7.5.1 The CPR as discussed above can give us further insight into crop husbandry across North Wales. A more detailed overview of the archaeological evidence for Early medieval agricultural practices should be undertaken during the analysis and publication stages. The charcoal could be used for further analysis into plant and fuel management but would first need to be identified for further analysis to be undertaken. These deposits should be assigned a date, either through typological or absolute means, prior to analysis.

7.5.2 *Radiocarbon suitability*: material from samples listed in 7.3.4 and 7.3.5 may be suitable for radiocarbon determination. It must be stated that if a radiocarbon determination is sought from charcoal then the fragment must be identified to species prior to submission to select the shorter lived species to mitigate against the potential 'old wood effect' that may present a radiocarbon age far older than the feature.

7.5.3 If there is charcoal and CPR present within a context listed in Tables 7.2 but not stated within sections 7.3.4 or 7.3.5 these can undergo further assessment to gauge their suitability for submission.

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

7.5.5 *Retention and discard*: At this stage all ecofactual material should be retained until initial radiocarbon dates are obtained.

7.5.6 The magnetic matter from all samples may be discarded, as it offers no further potential.

7.6 Acknowledgments

7.6.1 Freddie Sisson supervised the environmental team which consisted of Megan Lowrie, Katherine Bostock and Jyoti Stuart. This report was edited by Lynne F. Gardiner.

Table 7.1 Sample Information

C	<>	TQ	Cut	Desc	Matrix	PW	PV	SW	SV
12030	12002	1	12002	secondary fill of ditch terminus	silty sand	9	6	2322	1600
12049	12003	2	12047	fill of pit	sandy silt	20	12	3863	2620
12041	12004	4	12047	fill of pit	sandy silt	44	25	11973	7550
12044	12005	4	12047	fill of pit	silty sand	52	27	14656	8900
12046	12006	2	12047	fill of pit	sandy silt	29	18	3939	2800

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

Table 7.2 Flot and Finds Information

		Flots				Retent			
C	<>	WF	VF	CPR	Ch	Ch	Bo	IW	MM
12080	12002	2.9	10	68	0.79	1	-	-	-
12049	12003	62.4	220	81	11.72	14	-	1	1
12041	12004	15	50	30	0.83	3	-	-	-
12044	12005	5.9	40	11	0.27	3	1	-	3
12046	12006	62.7	260	+	12.78	37	-	1	3

Key: C=context; <>=sample number; WF=weight of flot(g); VF=volume of flot(ml); CPR=count of charred plant remains; Ch=charcoal(g); Bo=bone(g); IW=industrial waste(g); MM=magnetised material(g)

8 CONCLUSIONS

8.1 Interpretation

8.1.1 The archaeology recorded within Area 12 is most likely to represent Early medieval settlement activity of the 7th/8th c. AD, probably related to the cemetery of the same date excavated nearby within Area 15. The radiocarbon dates from the evaluation and from the excavation correspond well with one another. The possibility that the small penannular gully and stretch of ditch could both date to an earlier period, perhaps the Late Iron Age/Romano-British period, cannot be ruled out. Settlement activity of this date was also recorded within Area 15. The form of the penannular gully, however, is not diagnostically Iron Age. It is known that some sites attributed to the Iron Age may instead be of early medieval origin e.g. Glanfraid, Geneu'r Glyn (Edwards *et al* 2017, 9). The radiocarbon dates from the pits and the lack of datable finds give a strong indication of an Early medieval date for each of the features encountered.

8.1.2 A penannular ditch of this size and form is indicative of a round house dwelling, the surviving ditch being the eaves drip gully around the outer edge of the structure which a north east facing entrance way sheltered from the prevailing western winds. The site is sheltered at the foot of the outcrop, but a north-eastern orientation does directly face the nearby coast. A single undated post hole in the interior of the ditch does not suggest that a timber structure was likely, which means it may have been constructed from clay or turf. It is possible that a stone wall or foundation wall was once present, and the stone has been re-used in the building of the later feature truncating the dwelling. The post hole likely dates to this later use.

8.1.3 Pit **[12047]** could be some form of grain drying kiln. The abundance of charred grains and charcoal in the basal fill may indicate this, and it was also noted that the geological clay which the pit was cut into appeared to be heat affected. The suggested stone lining of the pit is one similarity with the possible corn drying kiln excavated at Cefn Du, Gaerwen in 1999 (Cuttler et al, 2012).

8.1.4 The very shallow and fragmentary remains of an undated linear feature **[12017**=**12033**=**12035]**, possibly a ditch or hedge line, were aligned northeast-southwest. The feature certainly extended beyond and would equate to either of the similar linear features to the southwest, seen in the evaluation trenches as [**2137-008**=**2138-004**] or [**2137-006**=**2138-006**]. The orientation was the same as the field system elements seen in the nearby vicinity at Area 14. Although it remains unknown if they are contemporary, there is the potential for such features to have formed part

of a more extensive field system designed to provide a number of focused small, enclosed fields with specific functional use or whether they were more extensive and reflected land ownership.

8.1.5 The field system does not correlate with any depicted on historic mapping but does follow the orientation of the current field layouts. There was no clear evidence for occupation, such as features or discarded rubbish, within the enclosed areas, and the fields may have been used for either arable production or for pastoral use (grazing or segregating stock). The field system is most likely to date to the medieval period, but this is based on morphological similarities to such features in the region. The layout may be part of open-field farming with the ditches forming boundary and drainage features associated with relict narrow strip fields.

8.1.6 In terms of the paleoenvironmental data, Area 12 has good results from the limited number of contexts. The charred plant remains demonstrate the presence of cereals and this supports the hypothesis that the large pit might have functioned as a crop processing feature, or at the very least material was being deposited within it from adjacent crop processing. The crop processing might therefore have been occurring at a specified point in the landscape rather than part of an occupation site. This is part of an observed pattern, with such activities taking place on the periphery of early medieval settlements (Edwards *et al* 2017, 11). It may be comparable with crop husbandry practices seen across Anglesey such as at Cefn Du and Melin y Plas (Ciaraldi in Cuttler *et al*, 2012) where wheat was one of the regular crops being produced.

8.2 Significance

8.2.1 The archaeological remains at Area 12 need to be recognised in their own right. The proximity to the Early medieval cemetery within Area 15 increases the possibility that all of the features encountered relate to activity of this date. Early medieval settlement evidence is highly significant, given the rarity of known sites of this date in the region (IFA Wales 2003, 2011, CIfA Cymru/Wales 2017). Remains of this type and date are not common and Area 12 will produce valuable information on aspects of early medieval arable farming and environment.

8.2.2 Evidence of early medieval settlement in north west Wales is largely based on the few references made in documentary sources. This indicates a pattern of disparate farming sites located in close proximity to a small number of emerging minor ecclesiastical complexes on Anglesey. There is a general awareness that features related to settlements are difficult to identify and locate (Edwards *et al* 2017, 7) and early

medieval structures and settlement, including pit clusters and postholes, may be under-represented since they are not usually clear in non-invasive surveys and, even as part of archaeological excavations, they may only be present as undated features.

8.2.3 The potential corn drying kiln would suggest some form of early medieval settlement is in close proximity and the analysis of the palaeobotanical remains may contribute to the understanding of the economy, land use and the exploitation of resources in the early medieval period. Other recently published and ongoing sites which may allow comparison include Cefn Cwmwd (Roberts *et al* 2012, 30-65) and Llanbedrgoch (Redknap 2016, 2004); Rhuddgaer is another settlement site excavated by Gwynedd Archaeological Trust, that is broadly contemporary with Area 12.

8.2.4 The Area 12 material has little potential to develop a better understanding of industrial activity, particularly with reference to stone quarrying and stone/ore resource use in coastal regions and the exploitation of superficial deposits of stone and ore. It has been noted that two large stone outcrops are present within Field L1 and there is some evidence that these have been quarried in the past, but nothing could be derived from Area 12, although stone was used as a building material within the features.

8.2.5 Trying to establish dates and patterns of field systems is crucial in developing the understanding of the landscape of Anglesey over time and how people are living in and moving through it. The possible linear field boundary in Area 12 may be part of such a landscape but its significance is low due to the undated nature of the remains. Boundaries, drainage features and possible trackways, with further study, may be found to fit with earlier patterns of land divisions, perhaps medieval, perhaps even earlier. The significance of the individual 'site' may be enhanced when looked at on a regional scale and this may not be apparent until research and synthesis has been applied. A good example of where this can be seen is the West Heslerton project (Powlsand *et al* 2014).

8.2.6 The features and deposits are repositories of palaeoenvironmental data. There is particular emphasis on obtaining accurate C14 dates in order that the chronology of sites and ceramic sequences can be ascertained. The soil samples from the features contained quantities of charcoal and charred plant remains including cereals. This augments their archaeological potential, as there is '*a general scarcity of environmental data from Anglesey*' (Cuttler et al. 2012, 241) with which to reconstruct ancient farming practices and changes in the landscape. Notably the environmental

assessment also identified assemblages of charred plant remains and charcoal which could have the potential to identify different fuel sources, potential woodland and heath uses, alongside the enhancement of arable farming in the vicinity of area 12 during the early medieval period.

8.2.7 Charred cereal grains and chaff (emmer/spelt wheat and barley) were present within the soil samples from the features sampled, indicating that crop processing had taken place but not whether the crops were grown locally. Grain processing and/or food preparation appears to have taken place in the vicinity of the early medieval features. The presence of cereal remains implies proximity to a settled population and suggests that they were engage in arable agriculture, which raises the possibility that some of the undated ditches seen across the landscape could be of a similar date.

8.3 Recommendations

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

8.3.2 The results of the Area 12 archaeological excavation should be incorporated along with the results of wider Wylfa Newydd scheme and the results disseminated to the interested parties and public. This should be done through deposition of an ordered archive at the suitable repositories for both physical and digital material, the deposition of a detailed report at the Historic Environment Record (HER) and through publication.

8.3.3 The full analysis of data from Area 12 should be utilised to consider issues discussed including what settled or other forms of occupation might have existed and how they can be recognized. In addition, why so little settlement evidence is seen for the early medieval period and does this reflects the nature of the archaeological resource or are there other factors involved. It will also be crucial to understand how evidence for settlement fits into patterns of landuse and determining if there are detectable regional variations. Further characterisation of the pattern of historic field systems is identified as a specific research aim in the WSI (HNP 2015, 2016) and full regional analysis including the Area 12 features may assist with understanding the development and degree of continuity of land divisions in Anglesey.

8.3.4 A full analysis of the appropriate environmental samples and the plant species present in the charred plant remains will provide insights into the local farming economy and the wider exploitation of the natural environment. This will be particularly focused on the early medieval period since the secure data relates to that era. Special regard should be considered in the potential of the environmental samples. These may potentially enhance interpretation and clarify the relationships of the features identified in Area 12.

8.3.5 It would have been desirable to acquire a radiocarbon date from the fill of the penannular gully, or the earlier ditch. Unfortunately, no sample material is available from these features.

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Wessex Archaeology 2018c. Wylfa Area 12 Fields L1C (central): Site summary Report Unpublished report ref. 209730.012 (Horizon Doc Ref: WYN-WES-CON-REP-00014)

Wessex Archaeology 2018d. Wylfa Area 13 Field L1E (east): Site summary Report Unpublished report ref. 209730.013 (Horizon Doc Ref: WYN-WES-CON-REP-00011)

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APPENDICES

APPENDIX 1: CONTEXT INDEX

Context Number	*Context Type*	*Description*	*Width*	*Height/Depth*	*Discussion*
12001	Layer	Mid-greyish brown silty clay with frequent gravel and pebbles	N/A	0.4m	Topsoil
12002	Layer	Mid-orange brown loam with frequent gravel and pebbles	N/A	0.5m	Subsoil
12003	Layer	Mid-orange brown clayey sand with frequent gravel and pebbles	N/A	+	Natural Geology
12004	Cut	Concave sides and convex base	0.6m	0.22m	pennanular ditch, west termini, filled by 12005 and 12012
12005	Fill	Mid greyish brown silty sand with moderate small sub-angular chert.	0.6m	0.14m	Secondary fill of ditch [12004]
12006	Cut	Steep concave sides and a flat base	0.95m	0.32m	pennanular ditch, west termini, filled by 12007 and 12013
12007	Fill	Brown sand	0.3m	0.16m	Secondary fill of ditch [12006]
12008	Cut	NW-SE Straight vertical sides and a flat base	0.8m	0.35m	Possible stone lined channel, associated with large pit [12019]

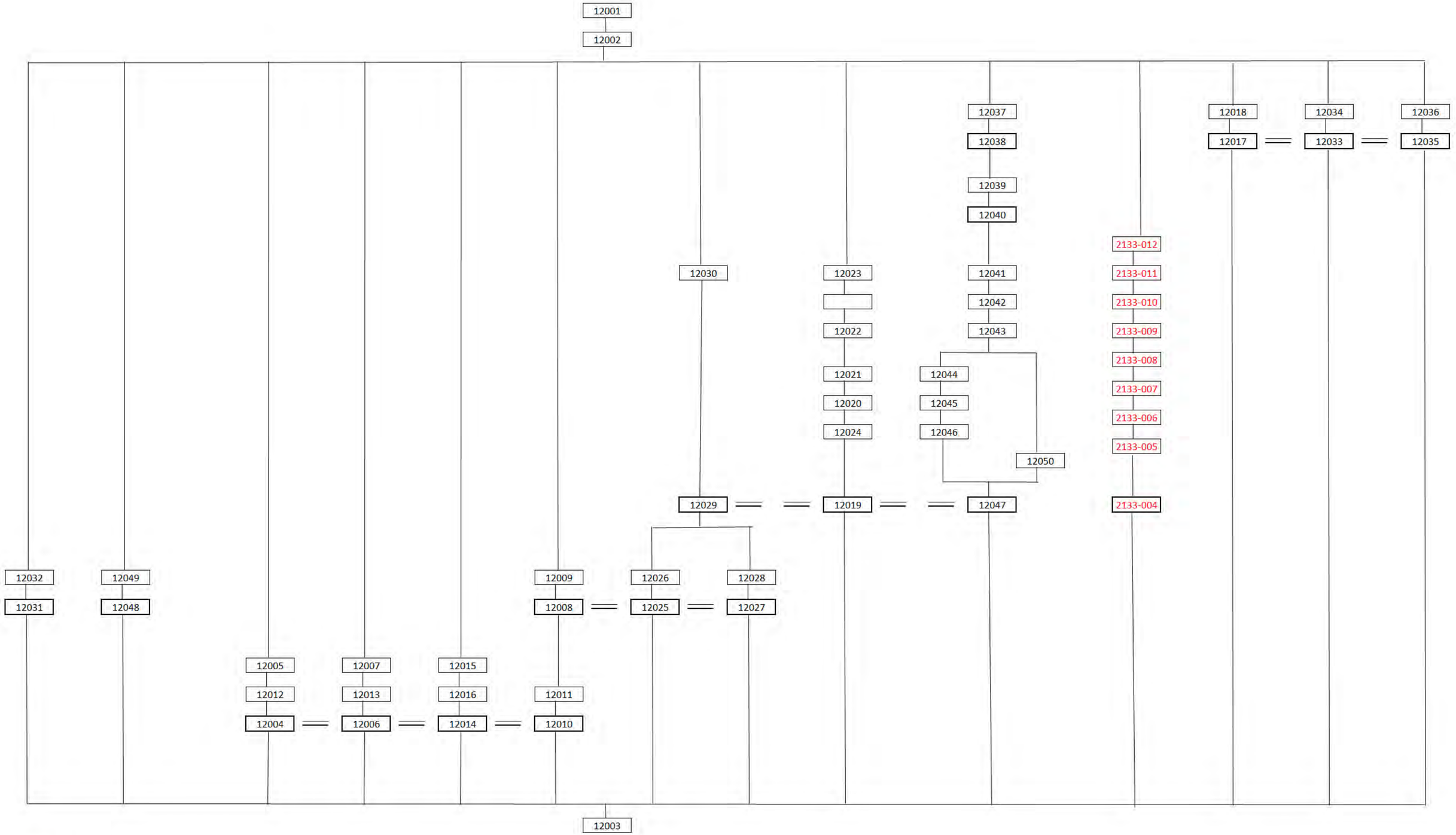
Context Number	*Context Type*	*Description*	*Width*	*Height/Depth*	*Discussion*
12009	Fill	Dark greyish brown silty sand, occasional small stones	0.8m	0.35m	Fill of channel [12008]
12010	Cut	Straight steep sides and flat base	0.95m	0.35m	pennanular ditch, filled by 12011
12011	Fill	Mid greyish brown silty sand with occasional stones no larger than 0.03m	0.95m	0.35m	Fill of ditch [12010]
12012	Fill	Mid-reddish brown silty sand with occ. small sub angular black chert frags and small frags of slate.	0.6m	0.22m	Primary fill of ditch [12004]
12013	Fill	Yellowish brown sand with very rare charcoal	0.95m	0.32m	Secondary fill of [12006]
12014	Cut	U-shaped profile with steep sides	0.74m	0.18m	pennanular ditch, east termini, filled by 12015 and 12016
12015	Fill	Mid-greyish brown silty sand with small sub-angular chert and slate frags.	0.2m	0.09m	Secondary fill of ditch terminus [12014]
12016	Fill	Mid-reddish brown silty sand	0.74m	0.18m	Primary fill of ditch [12014]
12017	Cut	NE-SW linear ditch, concave sides and base	0.44m	0.18m	Drainage/boundary ditch. Modern pottery found near top of ditch
12018	Fill	Brown sand	0.44m	0.18m	Fill of ditch [12017]
12019	Cut	No context sheet	2.8m	1.04m	Pit filled by 12020 to 12024
12020	Fill	No context sheet	1.24m	0.02m	Fill of pit [12019]

Context Number	*Context Type*	*Description*	*Width*	*Height/Depth*	*Discussion*
12021	Fill	No context sheet	1.24m	0.04m	Fill of pit [12019]
12022	Fill	No context sheet	1.3m	0.2m	Fill of pit [12019]
12023	Fill	No context sheet	2.25m	0.98m	Fill of pit [12019]
12024	Fill	No context sheet	0.2m	0.5m	Fill of pit [12019]
12025	Cut	NW-SE Straight vertical sides and a flat base	unknown	unknown	Possible stone lined gully, associated with large pit [12019]
12026	Fill	Dark greyish brown silty sand, occasional small stones	unknown	unknown	Fill of channel [12025]
12027	Cut	NW-SE Straight vertical sides and a flat base, 20m length, fully filled with large stones	0.55m	0.6m	Possible stone lined gully, or foundation associated with large pit [12019].
12028	Fill	Dark greyish brown silty sand, occasional small stones	0.55m	0.6m	Fill of channel [12027]
12029	Cut	straight vertical sides and flat base	>0.63m	0.3m	Pit filled by 12030, truncat
12030	Fill	Dark greyish brown loamy sand with 3% small stones and 30% large stones. Contains possible hazel rod c.0.1-0.2m from top of fill	>0.63m	0.3m	Fill of pit [12029]. 11 large boulders in intervention, possibly structural but fallen in after went out of use.
12031	Cut	Straight, steep sides and V-shaped base	0.1m	0.07m	Single possible post hole, leaned to south. Some packing stones evident
12032	Fill	Dark greyish brown loamy sand with 10% sub rounded poorly sorted medium gravel		0.07m	Fill of post hole [12031]
12033	Cut	NE-SW aligned ditch,7m+ length. Concave sides and base	0.41m	0.09m	Drainage/boundary

Context Number	*Context Type*	*Description*	*Width*	*Height/Depth*	*Discussion*
12034	Fill	Mid-greyish brown sand, rounded to sub-rounded poorly sorted sand and gravel		0.09m	Fil of ditch [12033]
12035	Cut	NE-SW aligned ditch, 7m+ length. Concave sides and base	0.24m	0.04m	Drainage/boundary
12036	Fill	Mid-greyish brown sand		0.04m	Fill of ditch [12035]
12037	Fill	Light grey brown loamy sand. 60% abundant moderately sorted sub angular fine gravel	1.4m	0.32m	Fill of possibly later pit [12038]
12038	Cut	Concave sides and base,	1.4m	0.32m	Possible re-cut of pit [12047] but probably an interface
12039	Fill	Mid-greyish brown sandy loam. 40% moderately sorted sub angular fine gravel	1.2m	0.43m	Fill of pit [12040]
12040	Cut	Concave sides and base	1.2m	0.43m	Possible re-cut of pit [12047] but probably an interface
12041	Fill	Grey brown yellow sandy loam with very large angular boulders 20-100mm	0.5m	0.3m	Upper fill of pit [12047]
12042	Fill	Mid brown loamy sand. 50% abundant poorly sorted fine and course gravels. V. large angular boulders 20-100mm, Main bulk fill. Includes lighter yellow and orange brown pockets of sandy soils. Includes majority of rubble- possible tumble from the wall around edge of pit.	1.7m	0.54m	Fill of pit [12047]
12043	Fill	Light greyish yellow sandy loam, v. large angular boulders 20-100mm	1.02m	0.2m	Lower fill of pit [12047]
12044	Fill	Mid- greyish brown yellow sandy loam. 10% poorly sorted course sand	0.88m	0.1m	Lower fill of pit [12047]

Context Number	*Context Type*	*Description*	*Width*	*Height/Depth*	*Discussion*
12045	Fill	Mid pink yellow sandy loam, 10% moderately sorted medium sand	0.76m	0.03m	Lower fill of pit [12047]
12046	Fill	Dark black loamy sand, 100% charcoal with complete wood fragments.	1.38m	0.04m	Basal fill pit [12047], burnt deposit
12047	Cut	Only north side of pit recorded, concave side with a step in it and base.	2.4m	1.1m	Pit filled by 12041 - 12046, possibly re-cut by 12040
12048	Cut	No context sheet	0.85m	unknown	Pit filled by 12049
12049	Fill	No context sheet	0.85m	unknown	Fill of pit [12048]
12050	Structure	Roughly faced large unworked angular stones on the southern side of pit [12047]. Max 0.16 x 0.25m. Possible lined walling. The around the pit's side was possibly housing for a wall foundation given that large boulders were revealed at the step level.	0.46m	0.3m	Fill of pit [12047], Short length of possible wall remains at the edge of the pit

APPENDIX 2: HARRIS MATRIX



11111 Wessex excavation number
22222 Wessex or Headland evaluation number

APPENDIX 3: PLATES

Plate 1; penannular ditch **[12006],** facing N, 1 x 0.5m scale

Plate 2; eastern terminus of penannular ditch **[12014]**, facing E, 1 x 0.5m scale

Plate 3; post hole **[12031]**, facing W, 0.1m ruler scale

Plate 4; pit **[12047]**, facing NW, 1 x 2m scale

Plate 5; pre-excavation of linear ditch **[12027]** and penannular ditch **[12004],** facing NW, 2 x 2m scales

Plate 6; linear feature **[12027]** facing NW, 1 x 0.3m scale

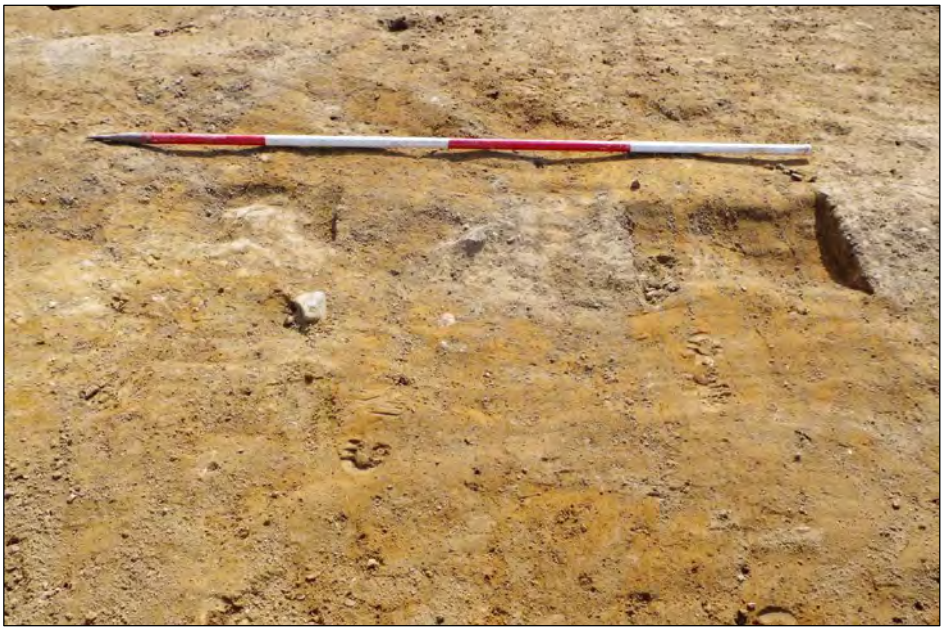


Plate 7; terminus of linear ditch **[12017]** facing SE, 1 x 2m scale

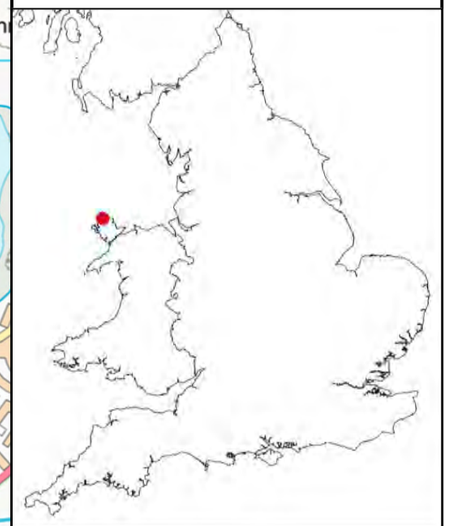
APPENDIX 4: FIGURES

DO NOT SCALE FROM THIS DRAWING

Wylfa Newydd development area

Excavation area

Hot spots



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

CLIENT

Horizon Nuclear Power

PROJECT

Area 12,
Wylfa Newydd, Anglesey

DRAWING TITLE

Figure 1:
Wylfa Newydd development area and excavated sites

DRG No.		REV
CL12283-1201		A
DRG SIZE	SCALE	DATE
A3	1:12,500	Feb 2020
DRAWN BY	CHECKED BY	APPROVED BY
HP	DAC	FG

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N:\CP\CL12283 - WYLFA POSTEX ASSESSMENT\03 - DESIGN\AUTOCAD\AREA 12\CL12283-1201-A.DWG

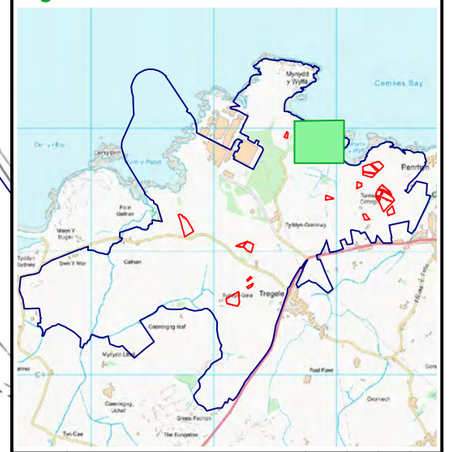
DO NOT SCALE FROM THIS DRAWING

Wylfa Newydd development area

Excavation area

Excavation areas in vicinity

Figure location:



Rock

MLW

Mean High Water

Rock

Rock

Coastal Slope

Area 11 L1(w)

Area 12 L1(c)

Area 13 L1(e)

Area 14 (L1/L20)

235750/393800

236000/393800

Pond

Path (um)

Issues

Shingle

0

100m

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

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PROJECT

Area 5,
Wylfa Newydd, Anglesey

DRAWING TITLE

Figure 2:
Detailed site location

DRG No.		REV
CL12283-1202		A
DRG SIZE	SCALE	DATE
A3	1:1,250	Jan 2020
DRAWN BY	CHECKED BY	APPROVED BY
HP	FG	FG

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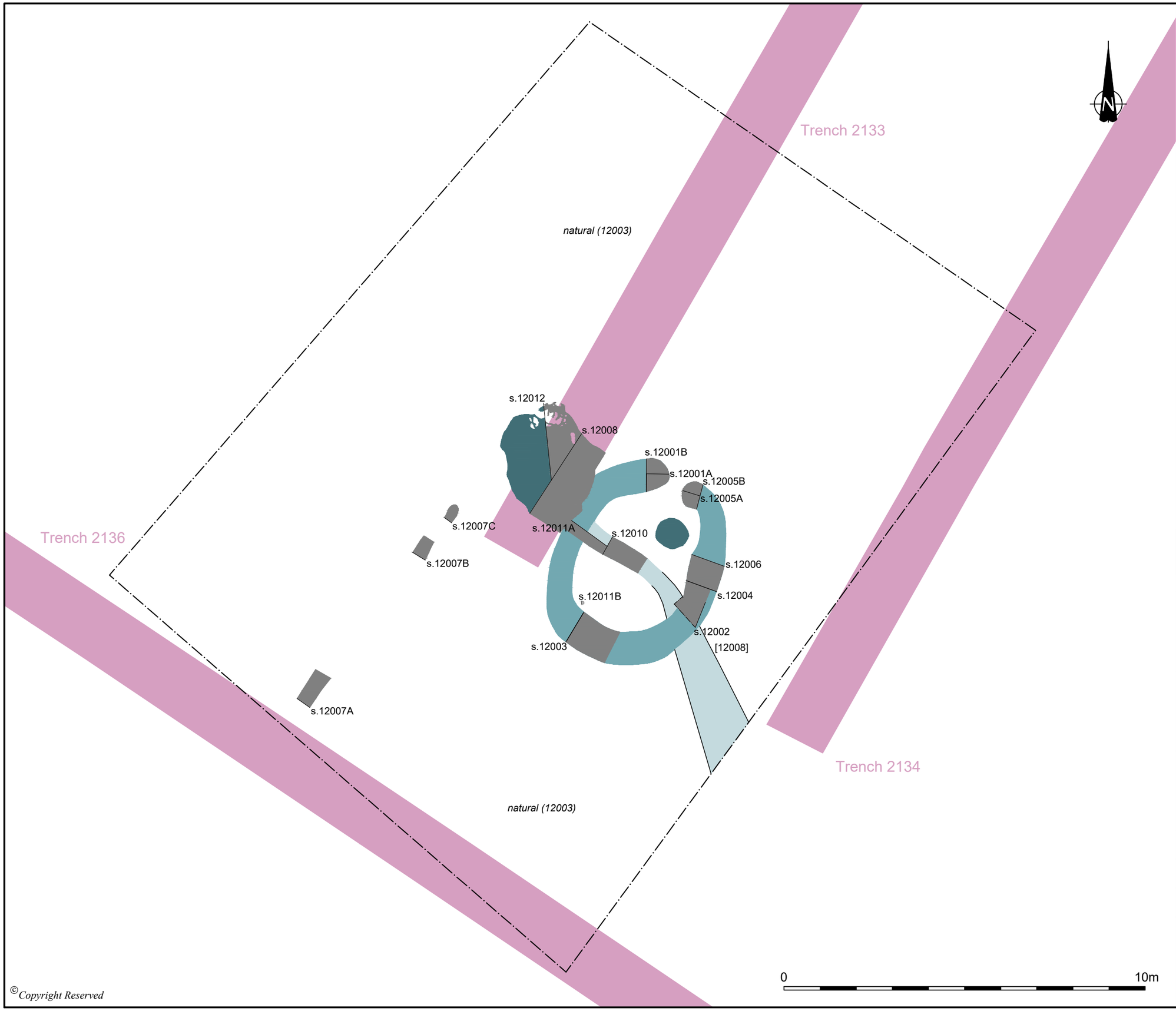

DO NOT SCALE FROM THIS DRAWING

(12000) Context numbers

Sections shown in further figures

Sections not shown in further figures

Limit of excavation

Excavated area

Trench location

Period 5 Early Medieval AD 410 – 1100

Phase 1

Phase 2

Phase 3

Undated

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
B	Addition of sections and alteration of phasing	24/05/21	HP	MH	FG

CLIENT

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PROJECT

Area 12,
Wylfa Newydd, Anglesey

DRAWING TITLE

Figure 3:
Area 12; Phase plan

DRG No.	REV
CL12283-1203	B

DRG SIZE	SCALE	DATE
A3	1:100	Feb 2020

DRAWN BY	CHECKED BY	APPROVED BY
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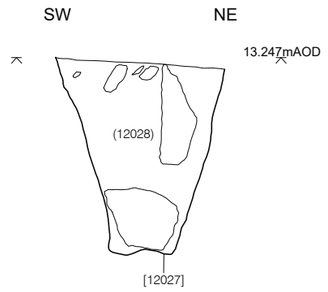
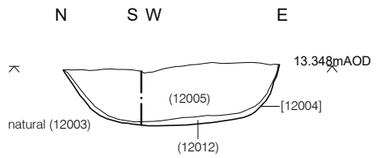
Phase 1 sections:

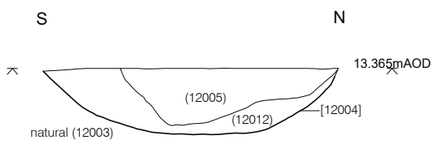


Section 12010. South-east facing section across gully [12027].

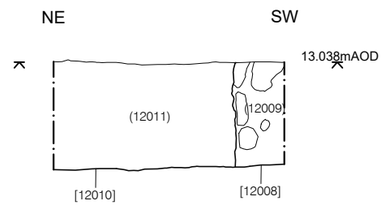
Phase 2 sections:



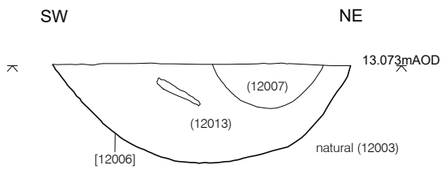
Section 12001A. East and south facing section across penannular ditch terminus [12004].



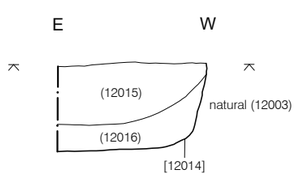
Section 12001B. East facing section across penannular ditch terminus [12004].



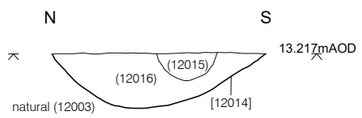
Section 12002. North-west facing section across gully [12008] and penannular ditch [12010].



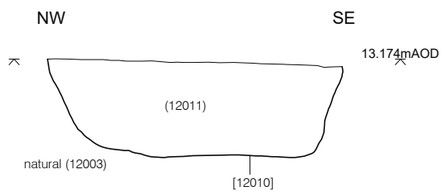
Section 12003. South-east facing section across penannular ditch [12006].



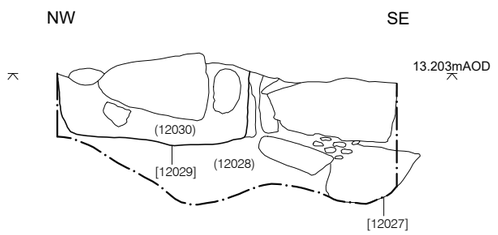
Section 12005A. North facing section across penannular ditch terminus [12014].



Section 12005B. West facing section across penannular ditch terminus [12014].



Section 12006.South-west facing section across penannular ditch [12010].



Section 12011A. South-west facing section across penannular ditch [12029] and gully [12027].

0 2m

DO NOT SCALE FROM THIS DRAWING

(12000) Context numbers

Limit of excavation

Height mAOD

Stones

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
B	Addition of sections	24/05/21	HP	MH	FG

CLIENT

Horizon Nuclear Power

PROJECT

Area 12,
Wylfa Newydd,
Anglesey

DRAWING TITLE

Figure 4:
Area 12; sections (1)

DRG No.	REV
CL12283-1204	B

DRG SIZE	SCALE	DATE
A3	1:20	Feb 2020

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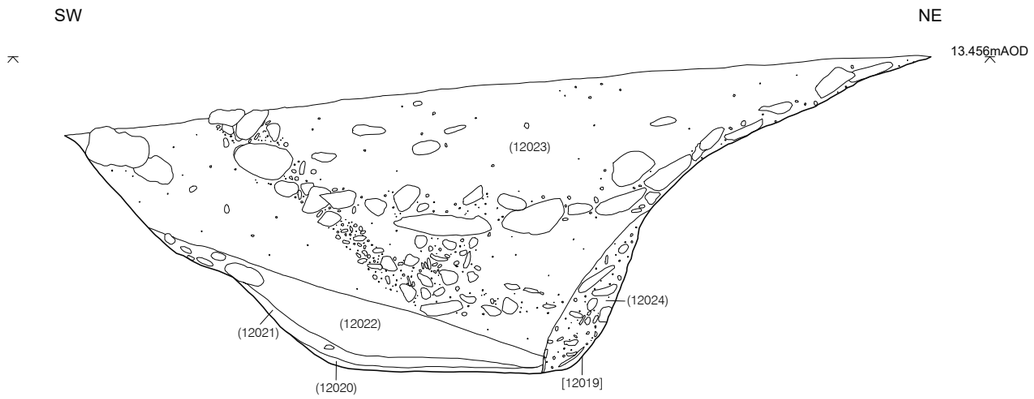
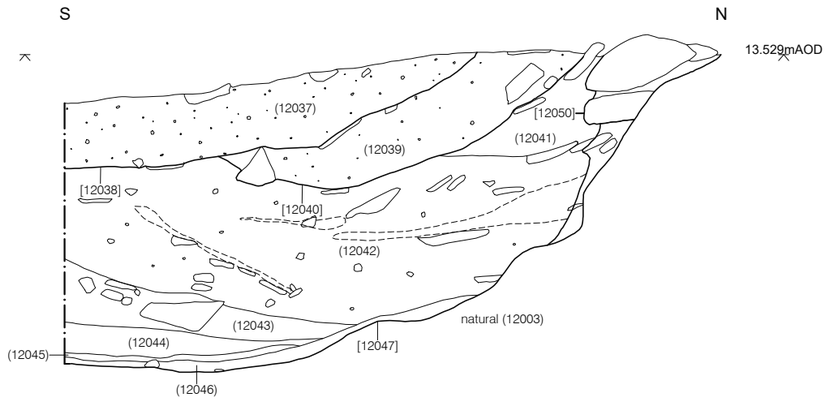
Phase 3 sections:

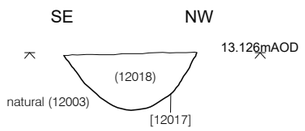


Section 12008. South-east facing section across pit [12019].

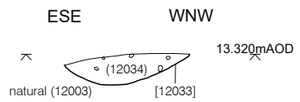


Section 12012. East facing section across features [12038], [12040], [12047], [12050].

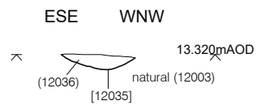
Undated sections:



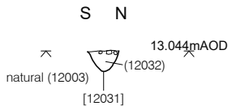
Section 12007A. North-east facing section across ditch [12017].



Section 12007B. NNE facing section across ditch [12033].



Section 12007C. NNE facing section across ditch terminus [12035].



Section 12011B. East facing section across posthole [12031].

0 2m

DO NOT SCALE FROM THIS DRAWING

(12000) Context numbers

Limit of excavation

Height mAOD

Stones

REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
B	Addition of sections	24/05/21	HP	MH	FG

CLIENT

Horizon Nuclear Power

PROJECT

Area 12,
Wylfa Newydd,
Anglesey

DRAWING TITLE

Figure 5:
Area 12; sections (2)

DRG No.	REV
CL12283-1205	B

DRG SIZE	SCALE	DATE
A3	1:20	Feb 2020

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APPENDIX 5: RADIOCARBON CERTIFICATES

BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

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

(Variables: d13C = -27.4 o/oo)

Laboratory number Beta-553550

Conventional radiocarbon age 1320 ± 30 BP

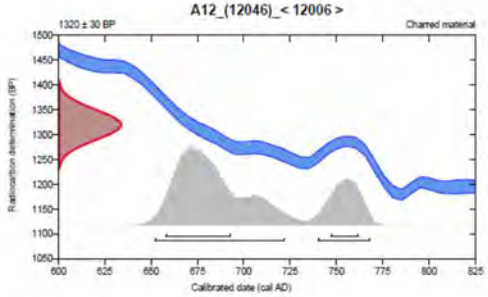
95.4% probability

(72.9%) 652 - 722 cal AD (1298 - 1228 cal BP)
(22.5%) 740 - 768 cal AD (1210 - 1182 cal BP)

68.2% probability

(52.3%) 658 - 693 cal AD (1292 - 1257 cal BP)
(15.9%) 747 - 762 cal AD (1203 - 1188 cal BP)

A12_(12046)_< 12006 >



Database used
INTCAL13

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

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

BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

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

(Variables: d13C = -23.2 o/oo)

Laboratory number Beta-553549

Conventional radiocarbon age 1350 ± 30 BP

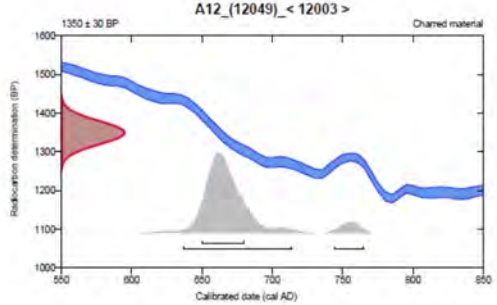
95.4% probability

(88.4%) 637 - 714 cal AD (1313 - 1236 cal BP)
(7%) 744 - 765 cal AD (1206 - 1185 cal BP)

68.2% probability

(68.2%) 650 - 680 cal AD (1300 - 1270 cal BP)

A12_(12049)_< 12003 >



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).

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APPENDIX 6: GAZETTEER OF FEATURES ENCOUNTERED IN AREA 12

Feature	*Date*	*Description*	*easting,northing*
Roundhouse	Iron Age/Romano British	An isolated roundhouse of possible clay or turf construction	235856,393896
Possible grain drying kiln	Early medieval	A large pit with possible associated linear feature with abundance of charred grains and charcoal returning radiocarbon dates of early medieval period. The clay into which the pit had been cut appeared to have been heat-affected	235853,393898

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

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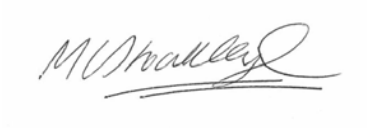
DATE ISSUED: April 2019

JOB NUMBER: **CL12271**

PREPARED BY:

Megan Stoakley — Finds and Archive Specialist



Lynne Gardiner — Senior Environmental Archaeologist

APPROVED BY:

Frank Giecco — Technical Director

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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.

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

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

Report Template

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

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

2. **Introduction**

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

2.2 Scope of the project.

2.3 Dates/duration of fieldwork.

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

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

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

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

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

3. **Summary of the excavation methodology**

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

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

3.3 Site planning strategy with justifications for the applied methodology.

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

4. **Site archive**

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

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

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

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

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

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

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

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

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

5. Stratigraphic data

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

5.2 Statement of significance of the stratigraphic data.

5.3 *Final pre-excavation plan.*

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

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

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

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

6. Artefacts

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

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

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

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

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

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

7. **Palaeoenvironment**

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

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

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

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

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

7.6 *Representative photographs of key assemblages*.

8. **Human remains**

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

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

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

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

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

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

9. **Discussion**

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

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

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

10. **Statement of potential**

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

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

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

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

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

11 Bibliography of sources used in the compilation of the PXA

12. Updated Project Design

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

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

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

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

12.4 Detail of illustrations required to support the stratigraphic analysis.

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

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

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

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

12.9 Details of illustrations required to support the artefact analysis.

12.10 Requirement for conservation works on material archive.

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

12.12 Details of resultant technical/archive report.

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

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

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

Task breakdown for PXA

1. **Processing**

1.1 Environmental sample processing

1.2 Cleaning human remains

1.3 Bulk finds cleaning

1.4 Small finds cleaning

1.5 Artefact stabilisation

2. **Archival preparation**

2.1 Finds marking

2.2 X-raying metal objects

2.3 Archive box purchase

2.4 Boxing

2.5 Site record checking and cross-referencing

2.6 Compilation of list of archival sources

2.7 Records scanning

3. **Data assessment**

3.1 Zooarchaeological remains

3.2 Insects

3.3 Snails

3.4 Shells

3.5 Plant macrofossils

3.6 Pollen

APPENDIX 1 METHOD STATEMENT: STAGE 1 FINDS PROCESSING

Finds processing and assessment summary

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

Washing and cleaning

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

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

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

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

Time estimates for finds washing and cleaning

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

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

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

APPENDIX 2 METHOD STATEMENT: STAGE 1 ENVIRONMENTAL PROCESSING

Environmental processing and assessment summary

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

General Biological Analysis sample

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

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

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

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

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

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

Recording of the Environmental Data

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

Waterlogged Samples

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

Paraffin Flotation

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

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

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

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

METHOD STATEMENT STAGES 2 AND 3 FINDS ASSESSMENT

Summary

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

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

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

Stage 2

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

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

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

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

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

Time estimates for finds marking and bagging and boxing

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

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

Stage 3

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

Time estimates for preliminary recording

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

Materials costs to be considered to PXA

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

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

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