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HORIZON NUCLEAR POWER LTD

WYLFA NEWYDD, ANGLESEY

UPDATED PROJECT DESIGN: ARCHAEOLOGICAL POST-EXCAVATION ANALYSIS, ARCHIVING AND PUBLICATION

MARCH 2021

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Wardell Armstrong
Marconi Road, Burgh Road Industrial Estate, Carlisle, Cumbria, CA2 7NA, United Kingdom
Telephone: +44 (0)1228 550 575 www.wardell-armstrong.com

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MARCH 2021

PREPARED BY:

Matthew Hobson — Associate Director: Archaeological Publication

REVIEWED BY:

Frank Giecco — Technical Director: Archaeology

APPROVED BY:

Chloe Brownlee-Chapman — Regional Director

Wardell Armstrong
Marconi Road, Burgh Road Industrial Estate, Carlisle, Cumbria, CA2 7NA, United Kingdom
Telephone: +44 (0)1228 550 575 www.wardell-armstrong.com

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Wardell Armstrong
Marconi Road, Burgh Road Industrial Estate, Carlisle, Cumbria, CA2 7NA, United Kingdom
Telephone: +44 (0)1228 550 575 www.wardell-armstrong.com

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This Updated Project Design has been produced by Wardell Armstrong on behalf of Horizon Nuclear Power (HNP). It has been written in line with the Procurement Specification for Post-excavation Assessment (Owen, R., 2019b) and guidelines issued by Historic England for the management of research projects in the Historic Environment (Historic England, 2015). A finalised version will be approved by Gwynedd Archaeological Planning Service and Cadw. The document draws on a previous stage work, involving the assessment of the data collected during 32 archaeological excavations undertaken within the Wylfa Newydd development area. The aim of archaeological assessment is to distinguish which parts of the archive have the greatest research potential, so that the best results, in terms of our increase in knowledge, can be achieved in the most efficient way possible. As the assessment work produced 30 effectively separate reports, a UPD is required both to provide an overview of the relative significance of each of the archaeological sites and how they might have related to one another in the past, and to provide the framework for costing and conducting three further stages of work. The three further stages are as follows: Stage 1 will involve further post-excavation analysis and specialist work, resulting in the production of a series of finalised archive reports. Stage 2 will involve the submission of the archive reports, along with physical and digital archives to the appropriate local repositories. Finally, Stage 3 will disseminate and publish the results in a manner appropriate to the research significance of the findings, with reference to the Research Framework for the Archaeology of Wales (IFA Wales/Cymru, 2008).

Wardell Armstrong
Marconi Road, Burgh Road Industrial Estate, Carlisle, Cumbria, CA2 7NA, United Kingdom
Telephone: +44 (0)1228 550 575 www.wardell-armstrong.com

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1 INTRODUCTION: DESCRIPTION OF THE PROJECT

1.1 Summary description

1.1.1 This Updated Project Design (henceforth UPD) has been produced by Wardell Armstrong on behalf of Horizon Nuclear Power (HNP). It has been written in line with the Procurement Specification for Post-excavation Assessment (Owen, R., 2019b) and guidelines issued by Historic England for the management of research projects in the Historic Environment (Historic England, 2015). A finalised version will be approved by Gwynedd Archaeological Planning Service and Cadw. The document draws on a previous stage work, involving the assessment of the data collected during 32 archaeological excavations undertaken within the Wylfa Newydd development area.

1.1.2 The aim of archaeological assessment is to distinguish which parts of the archive have the greatest research potential, so that the best results, in terms of our increase in knowledge, can be achieved in the most efficient way possible. As the assessment work produced 30 effectively separate reports, a UPD is required both to provide an overview of the relative significance of each of the archaeological sites and how they might have related to one another in the past, and to provide the framework for costing and conducting three further stages of work. The three further stages are as follows: Stage 1 will involve further post-excavation analysis and specialist work, resulting in the production of a series of finalised archive reports. Stage 2 will involve the submission of the archive reports, along with physical and digital archives to the appropriate local repositories. Finally, Stage 3 will disseminate and publish the results in a manner appropriate to the research significance of the findings, with reference to the *Research Framework for the Archaeology of Wales* (IFA Wales/Cymru, 2008).

1.1.3 The remainder of this opening chapter includes a description of the project's background and outlines the scope of the UPD in more detail. Chapter 2 gives a brief summary of the research significance of the archaeological findings, setting them in their regional and chronological context. Chapter 3 then details further work, which will be necessary for completing a final report on each of the archaeological sites and for publishing the findings. This includes an identification of which assemblages of artefacts and ecofacts require further specialist or scientific work. Chapter 4 then sets

out what the outputs for each of the three stages of work should include. These are, in short, a series of archive reports, a successful deposition of the physical, documentary and digital parts of the archive, a clear and well-illustrated popular booklet - disseminated to the local community - and the publication of a peer-reviewed, academic monograph of several hundred pages.

1.2 Project Background

1.2.1 The necessity to produce an Updated Project Design at this time, ahead of the final completion of the post-excavation assessment work, is a consequence of the decision to dissolve Horizon Nuclear Power from March 31st 2021. The excavations conducted during 2017/2018 were part of the archaeological mitigation associated with the project to build a new nuclear power plant on the Wylfa Newydd site in order to discharge the requirements of a forthcoming DCO. With the decision to bring the project to an end and to withdraw the DCO application, the aim of the UPD has shifted somewhat from that originally stated in the Procurement Specification for Post-excavation Assessment (Owen, R., 2019b). The chief aim now is to pass on a well-ordered project that can reach ultimate completion under the overall responsibility of Isle of Anglesey Council (IACC), supported by Gwynedd Archaeological Planning Service (GAPS). While a significant amount of archaeological fieldwork has taken place, a proportion of the mitigation work planned by Horizon Nuclear Power has not been undertaken (Figure 1). The following sections outline the work which has been undertaken to date.

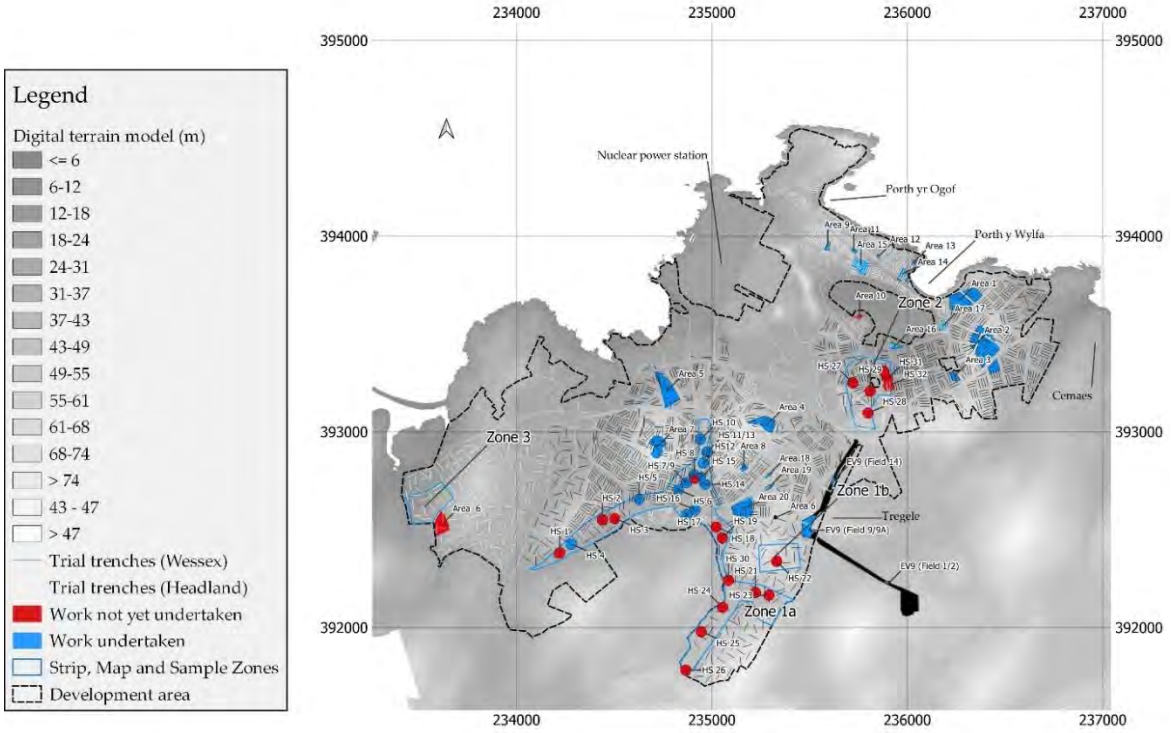

Figure 1 Archaeological mitigation within the Wylfa Newydd development site

Desk-based assessment, geophysical survey and trial trenching

1.2.2 Following an archaeological baseline assessment of the proposed Nuclear Power Station development area produced by Gwynedd Archaeological Trust (GAT) in March 2010 (Davidson, 2010), a vast programme of geophysical survey was carried out by Fugro Aperio Ltd from November 2010 to April 2011. GAT undertook a watching brief on groundworks associated with Fugro Aperio's multi-platform survey, which included groundworks and test-pitting (Davidson, 2011). Individual reports were produced by GAT on the interpretation of the Fugro Aperio's vertical magnetic gradiometer (VMD) results (Hopewell, 2011a) and on the results of further targeted geophysical survey conducted to test the original results in five 1 ha zones (Hopewell, 2011b). In 2011 GAT also conducted small-scale targeted trial trenching of some selected areas where clear geophysical anomalies had been recorded; ten trenches were excavated in five zones (Owen and Roberts, 2012). A final report interpreting all of the geophysical survey results with reference to the GAT's trial trenching was completed in February 2012 (Hopewell, 2012) and the baseline assessment report was updated (Cooke, Davidson and Hopewell, 2012).

1.2.3 As land acquisition continued, further areas were subjected to geophysical survey by West Yorkshire Archaeological Services (WYAS). WYAS conducted survey from November - December 2014 over 91ha (Webb and Harrison, 2015). A desk-based hedgerow survey was carried out by GAT on behalf of Jacobs Ltd (McNicol, 2015). The report recorded 232 field boundaries, 105 of which were thought to be of historical significance. Large-scale trial trenching, encompassing 1,314 trenches over 232ha, was then undertaken by Wessex Archaeology from November 2015 to April 2016 (Noble, Daniel and Burgess, 2018). A further 452 trenches were excavated by Headland Archaeology from July to November 2016 (Bain, 2018).

Excavation areas and strip map and sample 'hotspots' and palaeoenvironmental assessment

1.2.4 The results of the desk-based assessment, geophysical surveys and trial trenching were then used to inform a programme of archaeological excavation of 20defined areas. These works were to be carried out in accordance with a Written Scheme of Investigation (WSI) produced by Jacobs Ltd and GAT on behalf of Horizon Nuclear Power, which covered all archaeological trial trenching and excavation (Dempsey, 2015). In addition to the original WSI a series of technical updates were issued by Horizon Nuclear Power's then archaeological consultant Daniel Hounsell (Hounsell, D., 2016c, 2016e, 2017d, 2017e, 2017f, 2017i, 2017j, 2017k, 2017m). Hounsell also authored a separate WSI, issued by HNP, for the purpose of investigating 32 so-called archaeological 'Hotspots' that were planned to be subjected to a programme of strip, map and sample (Hounsell, D., 2017p). Zone 1a contained 25 hotspots, Zone 1b contained 1 hotspot, Zone 2 contained 6 hotspots and Zone 3 contained no hotspots. Each of these documents highlighted a set of research objectives relevant to the excavation work, explicitly drawing on the Research Framework for the Archaeology of Wales (IFA Wales/Cymru, 2008).

1.2.5 The WSI for the strip map and sample sites also contained a methodology for a planned palaeoenvironmental assessment of two areas (Hounsell, D., 2017p, pp. 47–48). Assessment Area 1 included the Tre'r Gof Site of Special Scientific Interest (SSSI) and Assessment Area 2 lay to the north of Caerdegog Isaf, toward the southern central edge of the Wylfa Newydd Development Area. The latter area was identified as a wet

marshy area with an interesting geological, archaeological and environmental make up during the trial trench evaluation works in fields A11 and A7 (Wessex Archaeology, 2016), but is not designated in any way.

1.2.6 To date, only 18 of the planned open-area excavations, and only 13 of the hotspot excavations, have taken place. Work on the palaeoenvironmental study had not begun prior to the suspension of all development works at Wylfa Newydd in 2018. Four of the areas encountered important settlement sites which extended beyond the limits of the excavation area: Area 4, Area 19, Area 20 and HS 15. The importance of the archaeology at these sites indicates the necessity for further excavation work in the future, should the Wylfa Newydd scheme restart.

1.2.7 Three sites encountered along the route of a cable diversion trench, which was constructed west and south of the village of Tregele, were excavated by RSK. Brython Archaeology undertook the excavation of Areas 7, Area 8, Area 15 and all of the hotspots. The rest of the areas were excavated by Wessex Archaeology.

1.2.8 Cross-referencing information on the archaeological fieldwork results at various stages of the project has been complicated by the use of different systems of field labelling. A different system was adopted along the cable route to that used during the trial trenching, the open-area excavations and the strip map and sample hotspots. Yet a third system of field numbering was introduced once the initial phase of land acquisition came to an end. As a result, a concordance table is necessary. Table 1 enables cross-referencing between the plot numbers and field codes and also relates the numbers of the trial trenches that intersected with each of excavation areas within each plot; Table 2 lists the same information for the archaeological hotspots.

Table 1 Concordance of field codes and land parcel numbers relating to the Wylfa Newydd excavation sites

Plot no.	Old field code	Excavation area	Excavator	Headland Archaeology	Wessex Archaeology	References
47	L3	Area 1	Wessex	N.A.	524-526, 528, 529, 1235-1239	(Hounsell, D., 2017n; Williams, M. and Tuck, A., 2018a; Hughes, 2020a)
48	L4	Area 1	Wessex	N.A.	631, 632, 635, 1231-1234	(Hounsell, D., 2017n; Williams, M. and Tuck, A., 2018a; Hughes, 2020a)
20	L16	Area 2	Wessex	N.A.	564-566, 1256-1258	(Hounsell, D., 2017o; Williams, M. and Tuck, A., 2018b; Horsley, 2020)
34	L12	Area 2	Wessex	N.A.	592-598, 639-643, 732, 733	(Hounsell, D., 2017o; Williams, M. and Tuck, A., 2018b; Horsley, 2020)
NA	L11	Area 2	Wessex	N.A.	545, 1246	(Hounsell, D., 2017o; Williams, M. and Tuck, A., 2018b; Horsley, 2020)
44	L8	Area 2	Wessex	N.A.	540-542, 873	(Hounsell, D., 2017o; Williams, M. and Tuck, A., 2018b; Horsley, 2020)

Plot no.	Old field code	Excavation area	Excavator	Headland Archaeology	Wessex Archaeology	References
45	Not evaluated	Area 2	Wessex	N.A.	N.A.	(Hounsell, D., 2017o; Williams, M. and Tuck, A., 2018b; Horsley, 2020)
46	L6/L9	Area 2	Wessex	N.A.	536, 1207	(Hounsell, D., 2017o; Williams, M. and Tuck, A., 2018b; Horsley, 2020)
17	K11	Area 3	Wessex	N.A.	434, 507	(Hounsell, D., 2017d; Williams, M. and Tuck, A., 2018c; Hughes, 2020b)
10	E3	Area 4	Wessex	N.A.	142, 143, 144b, 147, 1190, 1191, 1193	(Hounsell, D., 2017l; Williams, M., 2019; Laverty and Horsley, 2020)
57	A1	Area 5	Wessex	N.A.	17, 18, 19, 20, 21, 715, 716, 722-726	(Hounsell, D., 2017a; Williams, M. and Tuck, A., 2018d; Allsop, 2020a)
59	A3	Area 7	Brython	N.A.	84-86, 88, 97, 672, 673, 675, 676, 686. 691, 692	(Hounsell, D., 2017b; Nelson-Viljoen, Macros and Parry, 2020)
62	A9	Area 8	Brython	N.A.	213, 214	(Hounsell, D., 2017c; Nelson-Viljoen and Macrow, 2020a)
53	F1	Area 9	Wessex	2244	N.A.	(Hounsell, D., 2017i; Weston, P. and Williams, M., 2018a; Hughes, 2020c)
54	L1	Area 11	Wessex	2196, 2197	N.A.	(Hounsell, D., 2017j; Williams, M. and Tuck, A., 2018e; Allsop, 2020b)
54	L1	Area 12	Wessex	2133, 2134, 2136	N.A.	(Hounsell, D., 2017j; Williams, M. and Tuck, A., 2018f; Graham, 2020)
54	L1	Area 13	Wessex	2282	N.A.	(Hounsell, D., 2017i; Williams, M. and Tuck, A., 2018g; Allsop, 2020c)
54	L1	Area 14	Wessex	2000, 2115, 2287	N.A.	(Hounsell, D., 2017j; Williams, M. and Tuck, A., 2018h; Hughes, 2020d)
54	L1	Area 15	Wessex	2146, 2153-2160, 2162-2165	N.A.	(Hounsell, D., 2017i; Butler, C. and Madgwick, R., 2020; Nelson-Viljoen, Macrow and Parry, 2020a)
31	K2	Area 16	Wessex	2021, 2022	N.A.	(Hounsell, D., 2016b; Williams, M. and Tuck, A., 2018i; Allsop, 2020d)
42	L2	Area 17	Wessex	2127-2130	N.A.	(Hounsell, D., 2016d; Williams, M. and Tuck, A., 2018j; Hughes, 2020e)
63	O6	Area 18	Wessex	N.A.	N.A.	(Hounsell, D., 2017g; Williams, M. and Tuck, A., 2018k; Hughes, 2020f)
71	O5	Area 19	Wessex	2083	N.A.	(Hounsell, D., 2017e; Weston, P. and Williams, M., 2018b; Hughes, 2020g)
71	O5	Area 20	Wessex	2088	371-374, 376, 1300-1305	(Hounsell, D., 2017e; Weston, P. and Williams, M., 2019; Young and Roberts, 2020)
97	?	EV9 (Field 9/9A)	RSK	2096	N.A.	(Hayes, 2016, 2017; Reilly, 2020)
98	O17	EV9 (Field 9/9A)	RSK	N.A.	778	(Hayes, 2016, 2017; Reilly, 2020)
78	E5	EV9 (Field 14)	RSK	N.A.	N.A.	(Hayes, 2016, 2017; Reilly, 2020)
N.A.	N.A.	EV9 (Fields 1 and 2)	RSK	N.A.	N.A.	(Hayes, 2016, 2017; Reilly, 2020)
124	Q4	Area 6 (Not excavated)	N.A.	2364, 2365, 2369	N.A.	(Hounsell, D., 2017h)
40	C8	Area 10 (Not excavated)	N.A.	C16-VEG	N.A.	(Hounsell, D., 2016a)

Table 2 Concordance of field codes and land parcel numbers relating to the Wylfa Newydd Hotspots

Plot no.	Old field code	Excavation area	Excavator	Headland Archaeology	Wessex Archaeology	Reference
61	A13	HS 11/13	Wessex	N.A.	134, 987	(Hounsell, D., 2017p; Nelson-Viljoen and Macrow, 2020e)
76	A8	HS 5	Brython	N.A.	315, 666	(Hounsell, D., 2017p; Nelson-Viljoen and Macrow, 2020b)
73	A7	HS 6	Brython	N.A.	254	(Hounsell, D., 2017p; Nelson-Viljoen, 2020a)

73	A7	HS 7/9	Brython	N.A.	252, 253	(Hounsell, D., 2017p; Nelson-Viljoen and Macrow, 2020c)
73	A7	HS 8	Brython	N.A.	1342, 1344	(Hounsell, D., 2017p; Nelson-Viljoen and Macrow, 2020d)
60	A4	HS 10	Brython	N.A.	938, 108	(Hounsell, D., 2017p; Nelson-Viljoen, Macrow and Parry, 2020b)
61	A13	HS 12	Brython	N.A.	135	(Hounsell, D., 2017p; Nelson-Viljoen, 2020b)
74	A12	HS 14	Brython	N.A.	233	(Hounsell, D., 2017p; Nelson-Viljoen, Macrow and Parry, 2020c)
74	A12	HS 15	Brython	N.A.	236	(Hounsell, D., 2017p; Nelson-Viljoen, and Macrow, 2020)
75	A11	HS 16	Brython	N.A.	1383	(Hounsell, D., 2017p; Nelson-Viljoen and Macrow, 2020f)
75	A11	HS 17	Brython	N.A.	358	(Hounsell, D., 2017p; Nelson-Viljoen, 2020c)

Wardell Armstrong's post-excavation work

1.2.9 In the early summer of 2018 WA Archaeology was contracted to undertake the post-excavation assessment on the 32 excavation sites. These can be broken down into 18 fixed-area excavations, 11 Strip Map and Sample excavation areas, (located to investigate 13 of the previously identified 'Hotspots'), and three sites encountered along the route of the cable diversion route around the north, west and south of the village of Tregele. A methodology for the post-excavation processing and writing of assessment reports was agreed with HNP and GAPS (Stoakley, 2019). When it was decided that the project to build the nuclear power station was being put into suspension, a methodology was drawn up for the processing and stabilisation of the archaeological finds and palaeoenvironmental samples (Owen, R., 2019a). Quantification of the physical archive at this stage is given in Table 3.

Table 3 Quantification of physical archive at point of suspension of works

Area	Sample Buckets (10 Litre Buckets)	Bulk Finds (kg)	Small Finds (no.)	Monolith samples
Area 1 (L3/L4)	28	1	0	0
Area 2 (L8/L12/L16)	141	6	2	0
Area 3 (K11)	56	1	10	0
Area 4 (E3)	428	6	2	15
Area 5 (A1)	14	2	0	0
Area 7 (A3)	1134	19	18	0
Area 8 (A9)	15	1	1	0
Area 9 (F1)	107	5	0	0
Area 11 (L1W)	4	0	0	0

Area	Sample Buckets (10 Litre Buckets)	Bulk Finds (kg)	Small Finds (no.)	Monolith samples
Area 12 (L1C)	14	1	0	0
Area 13 (L1E)	12	5	0	0
Area 14 (L1/L20)	45	6	1	0
Area 16 (K2)	4	1	0	0
Area 17 (L2)	12	1	0	0
Area 18 (O6)	0	0	0	0
Area 19 (O5N)	95	1	0	0
Area 20 (O5S)	1271	28	89	0
Area 15	6218	139	2044	0
Hotspot 5	196	4	6	0
Hotspot 6	33	1	4	0
Hotspot 7/9	345	1	27	0
Hotspot 8	31	1	2	0
Hotspot 10	22	0	0	0
Hotspot 11/13	348	25	25	3
Hotspot 12	0	0	0	0
Hotspot 14	40	1	18	0
Hotspot 15	450	34	166	0
Hotspot 16	28	2	7	0
Hotspot 17	0	0	0	0
Wylfa EV9	225	3	23	0
Totals	**11,316**	**295**	**2,445**	**18**

1.2.10 A specification for post-excavation assessment was then issued (Owen, R., 2019b) along with a method statement produced by WA (Stoakley, M. and Gardiner, L., 2019).

Finds and ecofacts assessment

1.2.11 Some post-excavation tasks had already been carried out, however, with the result that the assemblages from the 32 sites have not all been dealt with in precisely the same way. The lithics from all sites, apart from the three encountered along the EV9 Cable Diversion, were assessed by Dr Miguel Gonzalez. A brief summary of the lithics from the cable diversion sites is included in the GAT report, written by George Smith, a freelance specialist local to Gwynedd (Reilly, 2020, p. 16). All of the Prehistoric pottery was examined by Frances Lynch. Sue Thompson completed the assessment of all other categories of artefact, with the exception of the large stones and slates stored at the Menai Bridge compound. These, and the animal bone, were examined by Megan Stoakley. The slates stored at the compound represent a 10% sample of those found on the excavation sites, the majority of which were examined on-site and left

there. The environmental assessment for the EV9 Cable Diversions sites was conducted by Rosie Bishop (Reilly, 2020, pp. 133–137). All of the other environmental assemblages recovered from sampling were assessed by Lynne Gardiner and Freddie Lowrie-Sisson.

Post-excavation Assessment Reports

1.2.12 After WA assumed responsibility for the post-excavation work, Brython Archaeology were commissioned to write an assessment report for each of the site which they had excavated. GAT were commissioned to produce the post-excavation assessment report for Area 20 and the EV9 Cable diversion work. The production of post-excavation reports for the other sites excavated by Wessex Archaeology was taken on by WA. Twenty-nine separate post-excavation assessment report were thus produced, in addition to the RSK report which covered the EV9 Cable Diversion sites. The references for these reports are given in Table 1 and Table 2 above, which correspond with entries in the main bibliography of this report. For ease of reference, all relevant unpublished client reports are given in a separate reference list, organised by contractor and found in Appendix 1.

1.3 Research Aims and Objectives

1.3.1 The Procurement Specification for Post-excavation Assessment specified that, following the submission of the assessment reports, WA should produce an Updated Project Design (UPD) in accordance with MoRPHE guidelines and upon instruction by HNP (Owen, R., 2019b, p. 7). The use of the MoRPHE guidelines is because there is a significant research element to the project, by which is meant creative work, undertaken on a systematic basis in order to increase the stock of knowledge, and the use of this stock of knowledge to devise new applications.

1.4 Business Case

1.4.1 The fieldwork was undertaken pre-planning in support of the development control order (DCO) relating to the construction of a new nuclear power station at the Wylfa Newydd site. Although the fieldwork programme was suspended midway through the programme, and the DCO application subsequently withdrawn, Horizon Nuclear Power Ltd committed to take all completed archaeological fieldwork through to final publication. This updated project design will allow the next stage of this process to

commence and a costed scheme of works to be implemented to fulfil Horizon Nuclear Power Ltd.'s outstanding archaeological commitments at Wylfa Newydd.

1.4.2 From HNP's point of view, the function of the UPD should have been to detail the further analysis, reporting, publishing and archiving work required to discharge any requirements placed upon the DCO. The UPD was to include a costed programme detailing tasks and resources required to deliver works required beyond the assessment stage. The full cost of publication of publication was to be included within the UPD. A table of the programme was to be included as an appendix. Sites not requiring further work beyond the assessment stage were to be highlighted within the UPD, accompanied by the reasons for not taking the work further. The UPD was then to be submitted to HNP for comments. HNP then intended to liaise with the Curator regarding the UPD. WA as then to take into account any additional comments, issuing an edited copy to HNP, remedying any faults identified. WA was to be given ten working days to resubmit a revised copy of the UPD following receipt of the HNP comments.

1.4.3 The suspension of the Wylfa Newydd project and the dissolving of HNP have meant that the writing of the UPD has been brought forward. Instruction to write this UPD has been given prior to the completion of the assessment reports, which makes the submission of a fully definitive and fully costed UPD difficult. The aim of the UPD is to make sure that HNP's responsibilities with regard to the excavation archives and their publication can be successfully completed.

1.5 Project scope

1.5.1 This UPD has a scope that is limited to 32 excavation sites and their assemblages of finds and ecofacts. It should be noted that the assessment and archiving of the human bone recovered from Area 15 has been dealt with under a separate contract between HNP and Brython Archaeology. It should also be remembered that the 32 sites covered by this report were excavated as part of an incomplete programme of archaeological mitigation work. Additional or connected areas of archaeological importance, highlighted by geophysics and trial trenching, remain to be excavated. The lack of a palaeoenvironmental assessment, and the discovery of archaeological sites that are only partially investigated, leaves considerable work remaining before archaeological mitigation for any future development project can be considered complete. WA has

been commissioned manage the completion of the post-excavation assessment work, resulting in the production of an report on each of the sites and their assemblages, and to produce a UPD based on the assumption that future archaeological work within the development area will be dealt with and published separately.

1.5.2 As the original excavation work was carried out by Gwynedd Archaeological Trust, Brython Archaeology and Wessex Archaeology, completion of the post-excavation assessment phase has involved communication between WA and these institutions. The work has been overseen by Gwynedd Archaeological Planning Service and Cadw. When Horizon Nuclear Power cease to exist at the end of March 2021, the responsibility of implementing the post-excavation analysis work and publication recommended in this UPD will fall to HNP's parent company Hitachi Europe Limited and to the Isle of Anglesey Council.

1.6 Work relating to cultural heritage outside the scope of this UPD

1.6.1 Other heritage mitigation work has been completed, or begun, which falls outside of the scope of this document. In 2016 Jacobs Ltd produced a project design for the investigation and recording of 13 historic buildings, or groups of buildings, within the development area (Dempsey, 2016). Standing building recording took place on these assets and a number of reports were drafted. In 2018 an *Assessment of the Significance of Cestyll (Grade II) Registered Historic Park and Gardens (GD45)* was issued by GAT (Gwynedd Archaeological Trust, 2018). The work was commissioned by Jacobs Ltd on behalf of HNP and concluded that the valley garden is of national significance. The landscaping conducted in the 1960s for the original Nuclear Power Station, and done to Dame Sylvia Crowe's design, was assessed as heritage in a report by Jacobs Ltd (Klimek, M., 2018). The further work and dissemination on the results of these investigations falls outside of the scope of this Updated Project Design.

2 SUMMARY OF ARCHAEOLOGICAL SIGNIFICANCE

2.1.1 This chapter of the UPD draws on the conclusions of the 30 post-excavation assessment reports to give a summary of the archaeological significance of the findings. A brief overview is given, before dealing with each period in chronological order. Reference is made to the *Research Framework for the Archaeology of Wales* (IFA Wales/Cymru, 2008) and the research framework for northwest England (Brennand, M., 2007), since sites found along the coastline of the latter region are relevant for comparative purposes. The Welsh Research Framework is a collection of documents available online.[1] Several phases of documents have been released, the first being organised by region and period in the early 2000s. A refresh of the research framework documents in 2016/2017 jettisoned the regional divisions, keeping only the chronological breakdown. Even so, some periods are dealt with together e.g. the Palaeolithic and Mesolithic are tackled in unison, as are the Neolithic and Early Bronze Age. Many of the documents are in the form of notes taken during brainstorming sessions. For the prehistoric periods, for example, they list in bullet form research questions and methods that should be highlighted or championed, followed by lists of key sites included as appendices. As they stand, the research framework documents are difficult to use as a guiding to best practice in commercial archaeology. Where archaeology found within the Wylfa Newydd development is particularly relevant to the research questions raised by these frameworks, this has been highlighted.

2.1.2 As highlighted in Section 0, the set of technical updates to the WSI for Trial Trenching and Excavation and the WSI for the strip, map and sample contained lists of research objectives drawn from referenced documents belonging to the Research Framework for the Archaeology of Wales. The authors of the assessment reports have largely repeated this information in list form, without extensive further comments. For the purposes of the UPD this format has been abandoned in the hope of achieving something more useful, and certainly more digestible.

2.2 Landscape overview

2.2.1 Archaeological excavations were concentrated in two main areas within the development zone. Firstly, in the eastern coastal region of the development area,

[1] Available at https://www.archaeoleg.org.uk/intro.html

excavations were undertaken within a triangular zone west of the village of Cemaes. Secondly, some sites were targeted on hilltops and valleys to the south of the decommissioned reactor, roughly within a 1km radius of its perimeter. Some of the sites within the first clusters of open-area excavations were located immediately west of Cemaes, roughly 500m inland, along a spur of high ground. Situated atop this vantage point, evidence was found of Late Neolithic or Early Bronze Age ritual monuments, such as barrows and henges, and field systems of unknown date. Farther to the west, on the lower ground beyond this spur, sites were encountered around the shores of an ancient lake and in the narrow coastal strip beyond, which overlooks the two bays of Porth y Wylfa and Porth yr Ogof. The most important assemblage of Late Mesolithic/Early Neolithic stone tools and debitage was found in a depression close to the shores of Porth y Wylfa, where marine resources may well have been exploited. The most spectacular site excavated in this region, an early medieval cemetery, faced inland, overlooking the ancient lake, and attests to the continued occupation of the landscape into the 8th or 9th c. AD.

2.2.2 Ancient fields and systems of enclosures, not always readily datable, were recorded along with settlement evidence dating to the Iron Age and Roman periods. Three-hundred-and-sixteen graves were excavated, about a third of which produced human remains. Whilst the remains were not well preserved, they can now be further analysed to reveal information about the population of this region during approximately the 6th-8th c. AD. Bones can tell us basic facts about age and sex, but also about health, disease, diet and lifestyle. Well-selected bone samples may also help to date the use-life of the cemetery more accurately.

2.3 Summary of archaeological dating and significance

2.3.1 Significance has been allocated using the following scale:

Low: Clear archaeological evidence, but which is difficult to build any significant narrative upon, or to relate to specific regional research objectives.

Medium: Archaeological evidence which improves our knowledge of the spatial distribution of past activity, but which fits squarely within the set of type sites and material culture already identified within the region.

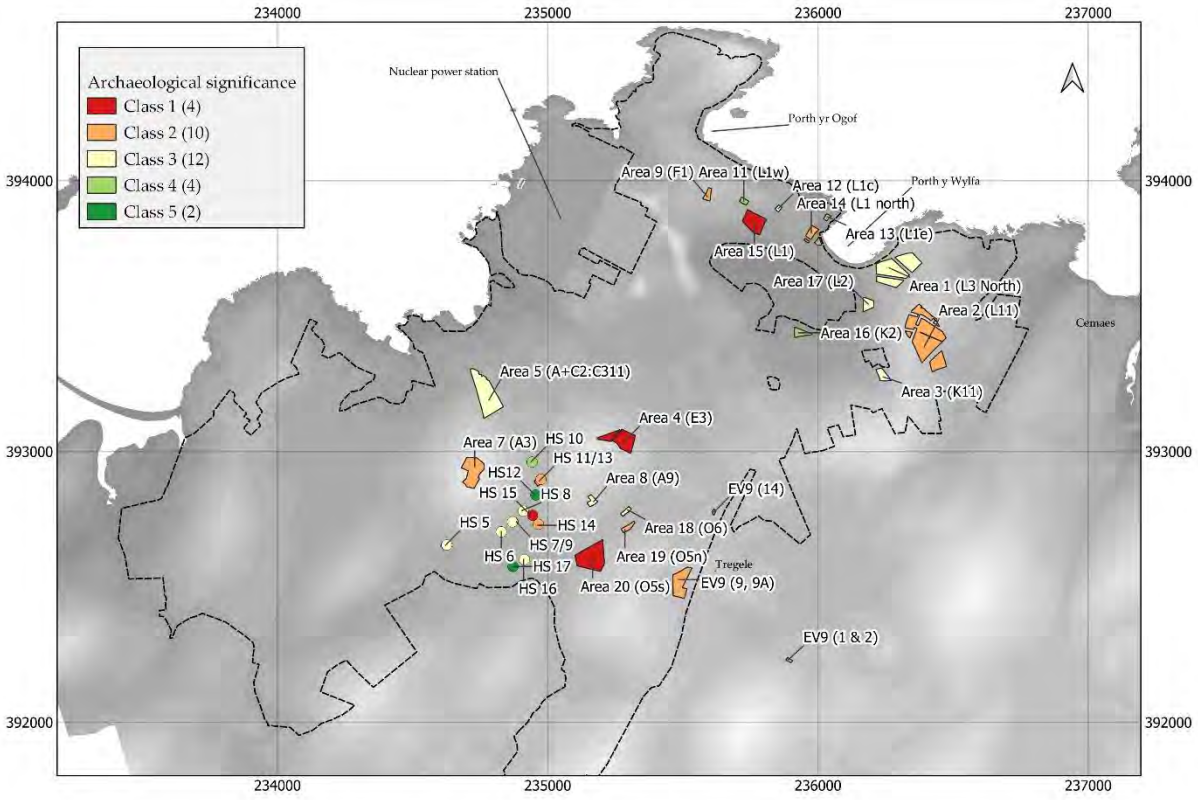

Figure 2 Overview of archaeological significance

High: Archaeology about which something significant can be said, and which adds to the corpus of developing knowledge about this period of the human past within Wales.

Very high: Archaeology which is may alter the existing research agenda for the region, by perhaps filling in a gap in excavated site types, presenting unique preservation for the region, or presenting particularly important finds assemblages, such as artefact, ecofacts, or human remains.

Figure 2 shows the spatial distribution of the sites, while Table 4 puts them in hierarchical order, with a brief summary of each.

Table 4 Sites by archaeological significance

Site name	Significance	Summary
Area 15 (L1)	1 Very high	5th-8th c. AD cemetery (316 graves, 104 with HR), LIA/RB settlement, Neolithic pit
Area 20 (O5s)	1 Very high	LIA/RB settlement (roundhouses)
Area 4 (E3)	1 Very high	RB Marching camp/Hilltop settlement enclosure?
HS 15	1 Very high	LIA/RB stone roundhouse and structure with raised floor
Area 14 (L1	2 High	Late Mesolithic/Early Neolithic site with continued occupation
Area 19 (O5n)	2 High	IA settlement (structures)
Area 2 (L11)	2 High	Henge/barrow, field system and settlement features
Area 7 (A3)	2 High	Early-med hilltop funerary site/IA settlement evidence
Area 9 (F1)	2 High	LIA/RB settlement
EV9 (9, 9A)	2 High	LBA occupation with pottery
HS 11/13	2 High	Early med. cemetery, Neolithic/Bronze Age settlement

HS 14	2 High	BA roundhouse
EV9 (1 & 2)	2 High	EBA pits with pottery
EV9 (14)	2 High	Late Neolithic pits with pottery
Area 1 (L3	3 Medium	Three Early Bronze Age burnt mounds, field system
Area 12 (L1c)	3 Medium	IA roundhouse, Medieval drying kiln
Area 17 (L2)	3 Medium	Med. field system, Mesolithic pit, pit with Prehistoric pottery
Area 18 (O6)	3 Medium	Undated trackway
Area 3 (K11)	3 Medium	Two Bronze Age burnt mounds, settlement features
Area 5	3 Medium	Late Bronze Age burnt mound with 2 troughs
Area 8 (A9)	3 Medium	Late Bronze Age burnt mound, troughs, field boundaries
HS 16	3 Medium	LIA/RB pits
HS 5	3 Medium	Late Bronze Age/Early Iron Age features, two burnt mounds and troughs
HS 6	3 Medium	Neolithic/EBA pits & gullies, trackway, med. enclosure
HS 7/9	3 Medium	LBA/IA burnt mound and troughs, One trough had a wooden lining. Trackway.
HS 8	3 Medium	Neolithic linears, later prehistoric pits/postholes
Area 11 (L1w)	4 Low	Tree-throws and possible post holes
Area 13 (L1e)	4 Low	Heat-affected stones in crevice
Area 16 (K2)	4 Low	Poorly dated enclosure ditches and pits
HS 10	4 Low	Neolithic/EBA pit, undated linears
HS 17	5 None	No archaeological features encountered
HS12	5 None	No archaeological features encountered

Radiocarbon dating

2.3.2 Due to the scarcity of datable finds on many of the sites, radiocarbon selection undertaken during the assessment phase was essential for providing a chronological framework and to increase the accuracy of dating within broader archaeological periods. During the evaluation stage 25 radiocarbon dates were successfully achieved. A further 125 followed during the assessment phase. An overview of the results of the radiocarbon dating programme is given in Figure 3 and will be useful to cross reference when reading the statements of significance, summarized by in chronological order within this chapter.

2.3.3 During the post-excavation assessment, the process of sample selection was undertaken WA's environmental archaeologist in communication with the authors of the post-excavation assessment reports. A list of sampled contexts for which a date was desirable was provided to the environmental team. The environmental team then sought suitable dating materials from within the available samples. If no suitable material was found to be present, or the provenance of the material was dubious (due to bioturbation or aeolian deposition, for example), one of the suggested alternatives was chosen in order to approach the dating problem.

2.3.4 If present in sufficient numbers to indicate a secure provenance and the absence of bioturbation, single growth entities, such as cereal grains and hazel nutshell

fragments, were preferred. In the absence of such material, charcoal was considered and used when necessary. The animal bone recovered from the Wylfa Newydd sites was so badly preserved and fragmented that in no case was this considered suitable for submission. Prior to the submission of charcoal samples, identification was undertaken to select the shortest-lived species (such as hazel, or heather, for example). When only longer-lived species, such as oak, were present, the youngest elements, such as twig or branch fragments, were selected. When long-lived species were the only species present the warning with regards to the old-wood effect was given to the author.

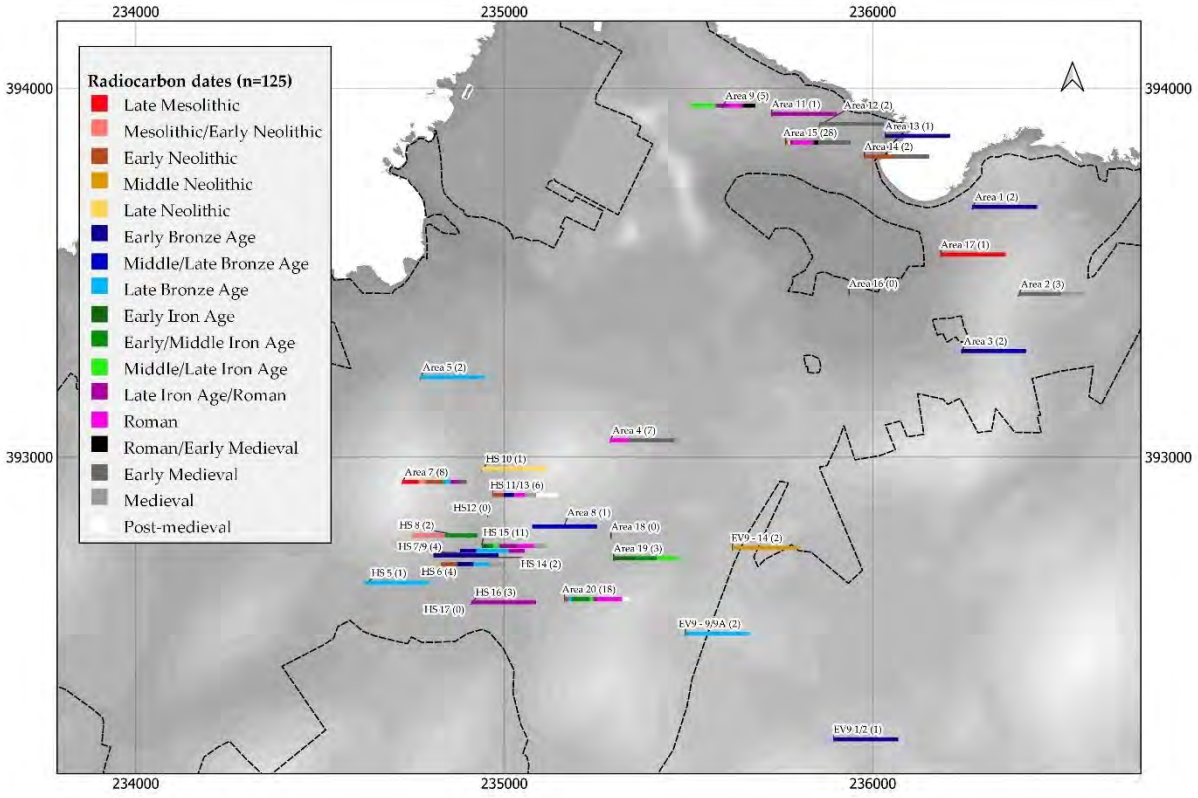

Figure 3 Distribution of the Post-excavation Assessment radiocarbon dates

Radiocarbon laboratories

2.3.5 Three different laboratories were used by the different archaeological companies engaged in the project work for radiocarbon dating (Table 5). Each of the laboratories used IntCal 13 for calibration (Reimer *et al.*, 2013).

Table 5 Summary of laboratories used for radiocarbon dating during the Trial Trenching and Post-excavation Assessment

Archaeology company	Stage of works	Radiocarbon lab	No. of dates returned
Wessex	2016 Trial Trenching	Chrono Centre	4
Headland	2018 Trial trenching	SUERC	21
Wardell Armstrong	Post-excavation Assessment	Beta Analytica	112
ABA	Post-excavation Assessment (Area 15)	SUERC	8
GAT	Post-excavation Assessment (EV9 cable diversion sites)	SUERC	5
		Total:	**150**

Further radiocarbon dates

2.3.6 One-hundred-and-twenty-three further samples have been highlighted for their potential to achieve additional radiocarbon dates (Table 6). The rationale behind recommending these samples is given in each of the relevant sections on radiocarbon dating included within Chapter 3.

Table 6 Number of samples recommended for additional radiocarbon dating for each site

Site	No. of prior dates	Charcoal	CPR	Hazelnut Shell	Human Bone	No. recommended
A1	2	2	-	-	-	2
A2	3	2	7	-	-	9
A3	2	2	-	-	-	2
A4	7	4	-	-	-	4
A5	2	-	-	-	-	-
A7	8	-	18	-	-	18
A8	1	2	-	-	-	2
A9	5	-	6	-	-	6
A11	1	-	-	-	-	-
A12	4	-	-	-	-	-
A13	1	-	-	-	-	-
A14	2	1	2	-	-	3
A15	36	9	11	-	10	30
A16	-	1	-	-	-	1
A17	1	1	-	-	-	1
A18	-	-	-	-	-	-
A19	3	3	-	-	-	3
A20	18	2	2	-	-	4
EV9	5	-	5	4	-	9
HS 5	2	3	-	-	-	3
HS 6	4	-	-	-	-	-
HS 7/9	4	1	-	-	-	1
HS 8	3	1	-	-	-	1
HS 10	1	-	-	-	-	-
HS 11/13	6	8	3	-	-	11
HS12	-	-	-	-	-	-
HS 14	2	5	2	-	-	7
HS 15	11	-	6	-	-	6

HS 16	3	-	-	-	-	-
HS 17	-	-	-	-	-	-
Totals:	137	47	62	4	10	123

2.3.7 The same prerequisites for selection of material should be adhered to as stated above. Some skeletal material has been recommended. Selection of bone material with collagen present is essential, meaning that more of this material is required for radiocarbon determination (*c*. 5g in contrast with *c*. 50mg of charcoal/charred plant material).

2.4 Period summaries (research framework)

Palaeolithic (500,000-10,000 BC)

2.4.1 No evidence relating to human activity during the Palaeolithic was recovered during the excavations.

Mesolithic (10,000-4,000 BC)

Regional background

2.4.2 The Mesolithic period designates changes which took place in human lifestyles following the retreat of ice sheets in northwest Europe following the last glacial maximum. It is associated with a shift from the hunting of large herds of wild animals to a broader hunter-gatherer economy. Proximity to water was particularly important for human groups during the Mesolithic, as there was a heavy reliance on the exploitation of marine resources and wildlife that was easily hunted in waterside locations. The presence of pottery is not known on Mesolithic sites in the British Isles, despite its recovery from Mesolithic sites excavated in Scandinavia (Pollard, 2002, p. 16).

2.4.3 In Wales the Mesolithic spans the period from the end of the Devensian glaciation at *c*. 8000 BC to the widespread adoption of agriculture which marks the onset of the Neolithic, in the centuries around 4000 BC. Cereal-type pollen (rather than positively identified cereal pollen) has been identified in deposits dating to the early-to-mid 5th millennium BC at a handful of sites along the west coast of Britain. This may indicate that the transition into the Neolithic was extremely gradual, with Mesolithic communities adopting aspects of an agricultural economy early on. Occasionally

excavated pits radiocarbon dated to this period have been found to contain burnt hazelnuts and other plants being eaten by Mesolithic peoples (Mithen, 2004, pp. 202–203). Any deposits dated to the Mesolithic containing organic material are of high research significance.

2.4.4 In this region the division between Early and Late Mesolithic is generally taken to be approximately 6500 BC. As the ice retreated and the climate became warmer in the Late Devensian interstadial period, the vegetation on the drier land developed into an open birch, juniper and willow scrub with a rich herbaceous flora. This was ultimately replaced by more open grassland with less stable soil conditions. In contrast to Scotland, where the removal of the weight of the ice sheet lead to the land rising up, the environmental changes resulted in a general rise in sea-level, an increase in rainfall, and natural successions of woodland vegetation. The retreat of the Devensian ice sheet alongside the Holocene marine transgression saw the coastline of the Late Mesolithic approaching that of today's, with the Study Area likely to have been on the coastline or just offshore (Shennan and Horton, 2002). To illustrate this point, in the earliest phase of the Mesolithic, by *c.* 7250 BC, the coastline of North West England lay at *c.* -20m OD (Tooley 1974, 33). This produced a coastline drawn roughly along a line from just west of Anglesey to west of Walney Island in Morecambe Bay, forming a belt of now submerged land, more than 20 km wide (Tooley 1985, Fig. 6.1). By *c.* 5200 BC the sea level had risen to -2m OD, and Britain had become an island (Tooley 1974; 1978; 1985). Palaeoenvironmental evidence indicates repeated woodland reduction episodes and, in the uplands, the burning of the woodland to encourage regeneration and browsing. During the 5th millennium BC gaps in woodland caused by human activity became gradually more common.

2.4.5 In northwest England the clustering of Later Mesolithic material in raised beach contexts around the Esk estuary suggests that communities were exploiting coastal resources and inland freshwater tarns. In western Cumbria, Later Mesolithic flint scatters have been located on the raised beaches of the maximum marine transgression and along clifftops north of St Bees. Perhaps the most dramatic evidence consists of a series of human footprints preserved in silts and muds at Formby, about 90km to the east of the Wylfa development area, some of which date to the Later Mesolithic, which indicate activity along a near-shore intertidal environment.

2.4.6 Scatters of lithic material provide the main evidence for occupation of the landscape, with few organic or structural remains identified to date. Two sites on the Wirral peninsula, Greasby Copse and Thurstaston Dungeon, have demonstrated that the coastline of North Wales was being used for the exploitation of local chert sources. Tool types include burins, microliths and crudely made leaf shaped arrowheads. Chert and flint are often present in close to equal proportions, with some of the most intricate tools being made from chert. A mixed assemblage of flint and chert, for example, was excavated at Trwyn Du, Aberffraw, (PRN 24043) 24km south of the proposed development area on the southwest-facing coast of Anglesey (IFA Wales/Cymru, 2008; Cooke, Davidson and Hopewell, 2012, p. 6).

2.4.7 Most sites known in Wales are located on coastal headlands, with inland sites invariably being found close to ancient lakes and rivers (IFA Wales/Cymru, 2008). There are extremely few perceptible technological differences between Later Mesolithic and Early Neolithic lithic scatters in the region and it has been suggested that a microlithic technology persisted well into the Neolithic period. Systematic fieldwork in inland areas is more generally characterised by the recovery of small numbers of lithic forms, including blade debitage, scattered widely across the landscape.

Mesolithic evidence from Wylfa Newydd

2.4.8 The proposed development site contains a coastal strip and the wetland Site of Special Scientific Interest Tre'r Gof, which was almost certainly a lake prior to its later silting. It is was known, therefore, prior to the archaeological mitigation work, that this landscape was likely to have been a focus for Mesolithic hunter-gatherer activity. This has been borne out by the evidence recovered during the archaeological fieldwork associated with the Wylfa Newydd project.

2.4.9 The Headland trial trenching programme found artefact scatters of Late Mesolithic/Early Neolithic date among an assemblage of 100 worked lithics (Craddock-Bennett, 2016, pp. 30–31). As the palaeoenvironmental assessment work originally outlined (Hounsell, D., 2017p) was never started, the sedimentation around Tre'r Gof remains poorly understood, but is likely to contain buried archaeological sites of high importance. By far the largest assemblage of lithics found during the Headland trial trenching came from Field L1, in a coastal strip just west of Porth y Wylfa. The

assemblage from this field includes 4 cores, 11 blades, 36 flakes, 9 debitage chips and 4 tools. The use of soft hammer reduction on some of the pieces from this field indicate a late Mesolithic to early Neolithic date. An unstratified single platform core from the western side of the development area (Field 115=Q3) was also thought most probably to date between the late Mesolithic and earlier Neolithic. The Trial trenching undertaken by Wessex Archaeology focussed on regions that were further inland, only yielding 27 worked stone artefacts (Wessex Archaeology, 2016). The majority of the material recovered by Wessex Archaeology was constituted by flake debitage, which is difficult to date accurately. The tip of a Mesolithic microlith was recovered from Trench 1189 in Field 10=E3).

2.4.10 Seven sites of the open area and 'hot spot' excavations yielded evidence of Mesolithic activity. Three ^{14}C samples returned dates in the Late Mesolithic, two from Area 7 and one from Area 17. Another sample from Area 7 returned a date range within the Late Mesolithic/Early Mesolithic. Finally, a sample from a deposit described as 'ditch fill' from HS 8 also returned a date in this range. All three of the samples from Area 7 came from the fills of graves, thought by the author of the PXA report to be of a much later date (most probably Early medieval). Four sites, different from those with Mesolithic radiocarbon dates, yielded lithic assemblages that were identifiable as Mesolithic/Early Neolithic: Area 14, Area 15, Area 20 and Hot spot 7/9. Possible Mesolithic features were recorded at three of these sites Area 14, Area 20 and Hot spot 7/9.

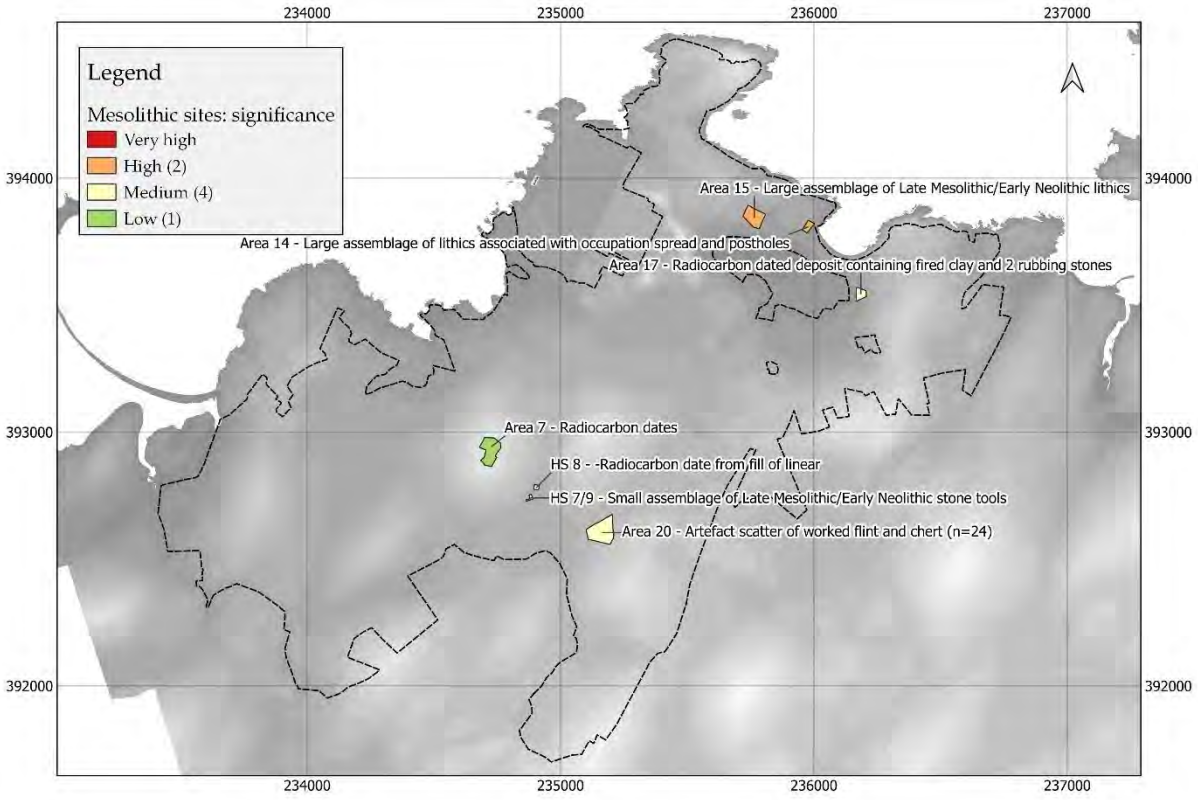

Figure 4 Significance of Mesolithic evidence recovered from the 32 excavation sites

2.4.11 At 3.4 kg and 372 individual pieces, the lithics assemblage from Area 14 is the largest from all of the 32 excavation sites. Dated as Late Mesolithic/Early Neolithic this lithic assemblage were recovered from an occupation spread and associated postholes and stakeholes. The presence of Late Neolithic/Early bronze Age pottery and ^{14}C within this range, indicate continued periodic use of the site.

2.4.12 Area 15 yielded a large lithics assemblage, which included Late Mesolithic/Early Neolithic material. For the most part this material was residual in later features, but further analysis should confirm if any of the discrete features could have been Mesolithic in date.

2.4.13 Within Area 20 a total of 24 lithic artefacts were recovered (322.48g). Although from excavated desposits, the majority of the material should be considered to be residual. A single pit was radiocarbon dated to the 4th millennium BC (Neolithic). Two cores were interpreted as Mesolithic in date, with the remainder of the assemblage dating from the Mesolithic or Early Neolithic, with the bladelets more likely to be Mesolithic.

2.4.14 One of the pits excavated within Hotspot7/9 contained Mesolithic and/or Early Neolithic stone tools. The lithic assemblage (21 pieces) appears to be mainly Neolithic in date, but three blade-based removals, two small thumbnail scrapers built over tertiary flakes (SF003 and SF021), and one end scraper knapped on a small blade (SF017) all indicate a Late Mesolithic/Early Neolithic date.

2.4.15 Within Area 17 the evidence amounts to a single spread of material sitting in a shallow pit or natural hollow [17039]. It contained an ashy deposit and fired clay (17040) as well as two possible rubbing stones. The environmental sample contained a small amount of charcoal but no other charred plant remains. A sample of guelder rose (*Viburnum opulus*) charcoal from the ashy deposit returned a radiocarbon date of 7830±30 BP (Beta-553526), with a 95.4% probability of 6747-6596 calBC. No stone tools were recovered from the deposit. Only a single struck chert was recovered from the excavation area. Evaluation trenches within the same field (42=L2) excavated by Headland Archaeology yielded 2 blades, 4 flakes and 5 chips of debitage, but none of these were highlighted as being diagnostically Mesolithic.

Significance and potential of the Mesolithic evidence

2.4.16 The Mesolithic material recovered during the trial trenching and excavations has inherent value due to the scarcity of evidence for human lifeways during this period. It adds to our knowledge of the spatial distribution of human activity in north Wales and northwest England. In general the material affirms previously observed trends in the data: the importance of proximity to the coast, or inland bodies of water, and a difficulty in identifying datable, in situ deposits with the potential to conduct archaeo-environmental analyses. The high acidity of the soil, however, has meant that important archaeological evidence such as human and animal bone hasn't survived in the few identified deposits thought to be truly Mesolithic in date. The research framework for Wales has stressed that "there needs to be focus also on the exposure and dating of terrestrial sequences, in river valleys and likely upland topographies, with precedence given to the dating of sequences rather than sites of mixed lithic signatures where stratigraphy is absent or unclear" (IFA Wales/Cymru, 2008). While the most significant Mesolithic evidence appears to be the lithic assemblages, the results of the post-excavation assessment phase indicate that these for the most part these fall into the category of mixed and unstratified assemblages. The mitigation work has thus far failed to reveal the most important category of Mesolithic site upon

which it would be desirable to focus. In the context of the Wylfa Newydd development area, two additional and related factors have impeded the ability to locate sites which might contain stratigraphic sequences in which stratified lithics assemblages can be related to other categories of evidence, such as palaeoenvironmental data, plant remains and animal bone. The first is a failure to focus attention on the investigation of water-edge sediment sequences where human occupation is likely to have been located. The second is the lack of understanding of the sediments around important landscape features, such as the probable ancient lake of Tre'r Gof, which resulted from the failure to undertake the paleoenvironmental assessment outlined in one of the WSIs (Hounsell, D., 2017p) prior to the suspension of all fieldwork on the Wylfa Newydd project.

Recommendations

2.4.17 Further efforts should be made during the analysis phase to identify deposits which may have contained contemporary, rather than residual, Mesolithic material. Cross-referencing should be undertaken to ascertain whether potential Mesolithic deposits contained both lithics and charred plant remains. Such deposits would be of the upmost research importance and should be radiocarbon dated where possible.

2.4.18 It is desirable that the Mesolithic material from all of the 32 excavation sites should be considered as a whole, as well as on an individual site basis, with an effort made to distinguish spatial and temporal patterns using a GIS (i.e. between Early and Late Mesolithic). Any potential avenues of research which may help to distinguish between Late Mesolithic and Early Neolithic assemblages typologically, should also be pursued with appropriate, supporting radiocarbon dating. The two rubbing stones from the deposit radio carbon dated to the Mesolithic should be sent to a relevant specialist.

Neolithic (4000-2200 BC)

Regional background

2.4.19 The onset of the Neolithic saw the widespread introduction of farming in this region in the centuries around 4000 BC along with the use of pottery. A number of stylistic changes in the form and decoration of ceramics have been dated to different phases within the Neolithic period (Pollard, 2002, pp. 16–19). The rise in sea level, which had been experienced during the Mesolithic, eventually resulted in the formation

separation of Anglesey from the mainland and the formation of contemporary tidal strait at some point between 3600 and 2800 BC (Roberts, M. J., 2006). The use of boats, already known archaeologically during the Mesolithic period, however, meant that the population of the island was still in touch with other groups. Little is known of Mesolithic burial practices in North Wales. By contrast, Neolithic communities invested a great deal of effort in constructing imposing burial monuments. Chambered tombs, or *Cromlech*, built by early farming communities to house the cremated remains of their dead, are distributed across Anglesey (Cooke, Davidson and Hopewell, 2012, p. 6).

2.4.20 Across Britain, the Late Neolithic (3000-2500 BC) is regarded as marking a phase of intensification of settlement, land-use and artefact production, and has been associated with the first indications for the existence of social hierarchies (Bradley & Edmonds 1993). Henge monuments, which emerge in this period and are unique to the British Isles (Pollard, 2002, p. 41). Anglesey is rich in megalithic monuments including, chambered tombs, passage tombs, and groups of standing stones and cairns.

2.4.21 Early Neolithic timber buildings have been found at several locations in northwest Wales, including on Anglesey, although Middle and Late Neolithic pit groups are more common. Recent excavations along the route of the A55, for example, recorded a number of settlement sites of this nature. The *Research Framework for the Archaeology of Wales* has emphasised that there should not be a fixation on clearly identifiable houses in discussion of how and where the Neolithic population lived (IFA Wales/Cymru, 2008). Both artefact scatters and excavated features are important for interpreting the use of the landscape in the Neolithic period. Artefact assemblages, when found in situ, do allow for a greater degree of interpretation. Excavated deposits, when environmental samples are taken from them, also provide the opportunity for palaeoenvironmental evidence to uncover new facts about the way in which people lived and farmed the landscape.

2.4.22 Extensive geophysics and even large scale stripping are advocated in the research framework for Wales (IFA Wales/Cymru, 2008). No wetland domestic site in Wales has been found, and thus the full range of artefacts in use has not been demonstrated. The framework also states that any possibility of a wetland site should be followed up.

Neolithic evidence from Wylfa Newydd

2.4.23 Archaeological features dated to the Neolithic period were recorded at 14 of the 32 sites (Figure 5), with nine of these producing corresponding radiocarbon dates. Seven sites had samples with date ranges falling within the Early Neolithic (Area 7, Area 14, Area 15, Area 20, HS 6, HS 8 & HS 11/13). Middle to Late Neolithic radiocarbon dates were returned for deposits from Area 7, Area 15 and EV9 field 14.

2.4.24 In terms of archaeological features, the evidence includes two possible henge/barrow monuments, numerous burnt mounds with associated troughs, as well as pit clusters, groups of stake holes, and isolated pits. The report produced by GAT on the interpretation of the geophysics remarks that trial trenching demonstrated that some of the geophysical anomalies relating to archaeological features would not survive beneath the subsoil (Hopewell, 2012, p. 28). This appears to have been the case with the possible Neolithic henge detected in Area 1, which was not found during the open area excavation. No clear evidence of Neolithic houses was recovered and field systems possibly related to burnt mounds and other occupation related features remain poorly dated. The main artefact groups, Lithics and Pottery, are summarised below.

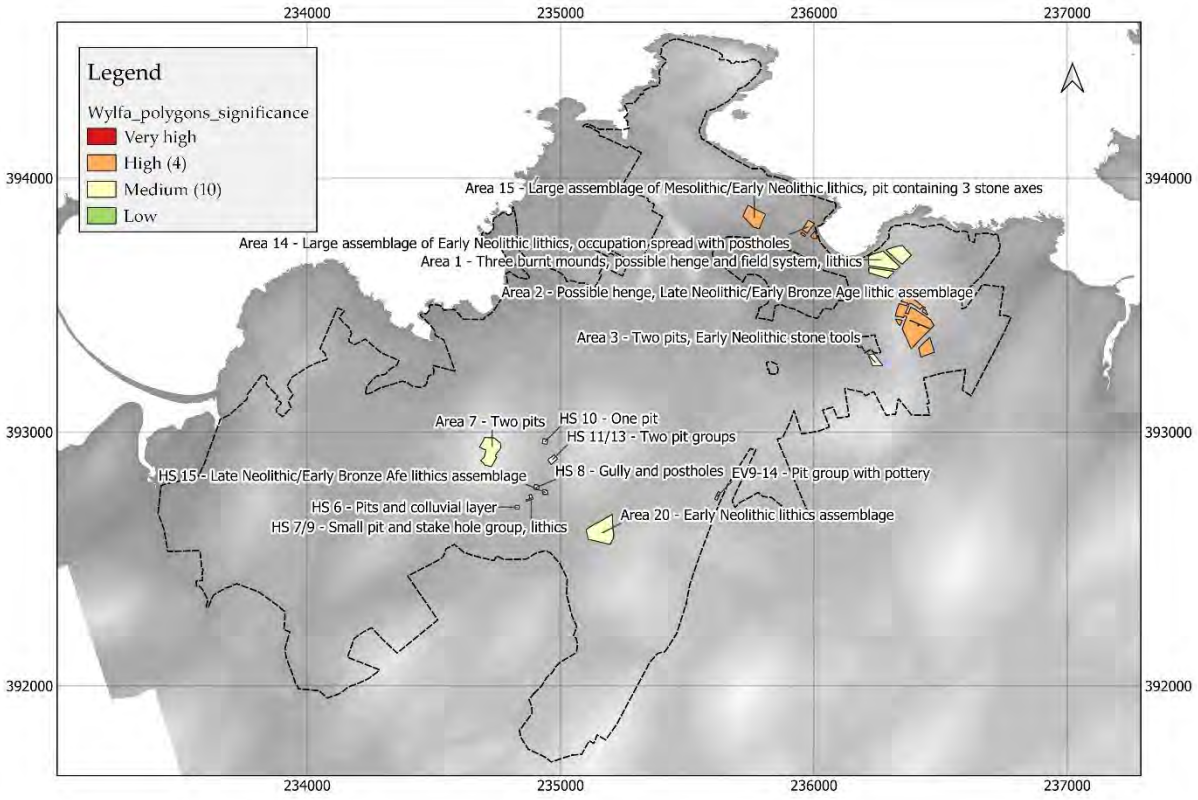

Figure 5 Significance of Neolithic evidence recovered from the 32 excavation sites

2.4.25 Seven of the excavation sites yielded assemblages of more than 10 lithic artefacts: Area 2, Area 3, Area 14, Area 15, Area 20, HS 7/9 and HS 15. Four of these assemblages, already mentioned above were noted to be Mesolithic/Early Neolithic in date. The assemblage from Area 3 is has been described as Early Neolithic, and those from Area 2 and HS 15 as Late Neolithic/Early Bronze Age. Neolithic axes were recovered from pits in Area 7 and Area 15.

2.4.26 Two sherds of Early Neolithic pottery from Area 15, not associated with the cache of three Neolithic stone axes, might be Irish Sea Ware, though not close to the very typical material from Llanfaethlu. The evaluation at Hotspot 11-13 recorded of 11 Early Neolithic sherds, but subsequent excavation did not produce anything of that date. Pottery of the Mid-Late Neolithic (predominantly Grooved Ware) was found in quantity at pits in EV9 Field 14. This material is very closely comparable to that from Llanfaethlu. Additionally, an undecorated sherd and three scraps in a very lightweight

fabric from Field Q11 (Evaluation trench 2414) near Cemlyn might possibly be Grooved Ware.

Recommendations

2.4.27 The research framework states that petrological analysis of stone axes should be encouraged as well as comparative study of Welsh sites and artefacts and with sites and artefacts along the Atlantic fringe.

Bronze Age (2,600-800 BC)

Regional background

2.4.28 Location of some Bronze Age copper mining sites is known, most notably a large copper mine at Parys Mountain, Amlwch, less than 10km southeast of the development area. There is a bias toward survival of archaeology in upland areas. Quite extensive field systems have been noted on the uplands, but are yet to be studied in enough detail. Poor bone survival in acidic soils makes ^{14}C dating of cremated bone the best material for improving our understanding of chronology. Pollen analysis is available in order to understand the palaeoenvironment. Burnt mounds and cairnfields are recognisable features. Proven remains of houses excavated in lowland areas show them to have been slight and made of wood. Upland equivalents might also have been made of wood, rather than stone, so are difficult to recognise. Pottery from funerary contexts is the most common and susceptible to stylistic, provenance and lipid analysis. The survival of domestic pottery, however, is far more rare. A corpus of Beakers, Food Vessels and Pigmy Cups exists.

2.4.29 The evidence for, and emphasis on, formal ritual and elaborate burial, so characteristic of the Earlier Bronze Age, falls away during the Later Bronze Age and becomes almost invisible during the Iron Age. Climate may, again, have contributed to the decline in popularity of the upland locations, which had previously been favoured for burial and ritual. The evidence for settlement, by contrast, increases during this period. From the Later Bronze Age, hillforts begin to dominate the landscape. Undefended settlement is also well represented.

Bronze Age evidence from Wylfa Newydd

2.4.30 Evidence of Bronze Age activity was recorded at 20 of the 32 sites (Figure 6). Radiocarbon dates falling within the Early Bronze Age have been returned for deposits from eight of these and Early Bronze Age pottery in some quantity has come from three sites: HS 11/13, HS 14 and EV9 fields 1 and 2. At Hotspot 14 sherds were found in association with structural evidence, and from a pit and surface scatter at the nearby Hotspot 11-13. This pottery is from a food vessel, and is closely comparable to food vessels found associated barrows on Anglesey. The work in the Llanfechell area, close to Cromlech Farm by RSK (EV9 Fields 1 & 2) produced a few sherds, very probably of Collared Urn. Probable Early Bronze Age pottery, without supporting radiocarbon dates, has also been found. A featureless sherd, possibly Early Bronze Age, comes from Area 17 (Evaluation Trench 2131) and another from Field K05 (Evaluation Trench 2103). Finally, a small amount of domestic Beaker pottery comes from Area 14. There is considerable overlap with sites described as Late Neolithic above. The assemblages of lithics from Area 2 and HS 15 fall into this category, being Late Neolithic/Early Bronze Age.

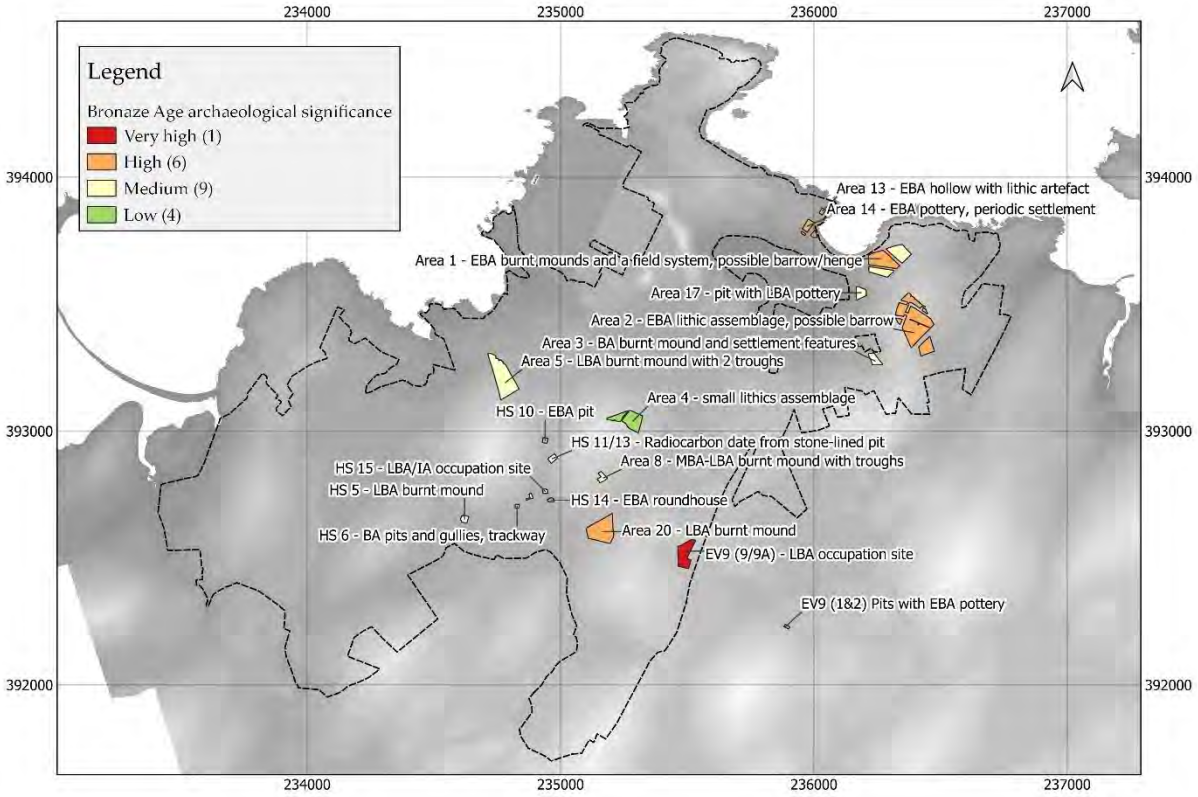

Figure 6 Significance of Bronze Age evidence recovered from the 32 excavation sites

2.4.31 Nine sites produced Middle or Late Bronze Age radiocarbon dates, with the Late Bronze Age dates being exclusively from the western group of sites, away from the coastline of Porth y Wylfa. Seven sites, not always the same ones as those that yielded radiocarbon dates, produced Middle to Late Bronze Age pottery. EV9 Field 9/9a is the only site possessing a good deal of pottery associated with clear structural settlement evidence, including a round wooden house, similar to that at Glanfeinion. Other sites (Areas 2, 3, 9, 15, 17 and Hotspots 7/9 and 15) have produced very little pottery, usually only one featureless sherd. There are hints, however, of round wooden houses in Areas 2, 9, 15 and Hotspot 7/9. Burnt mounds were recorded at Area 1, Area 3, Area 5, Area 8, Area 20 and HS 5.

Significance and potential of the Bronze Age evidence

2.4.32 Bronze Age occupation sites are notably rare in Anglesey. There are at Parc Cybi domestic contexts, such as hearths with Early Bronze Age pottery, but Wylfa Hotspot 14 has quite a lot of food vessel pottery in association with a convincing round house, similar to that at Stackpole Warren in Pembrokeshire. There is similar pottery at Hotspot 11-13, but no clear house plan can be outlined. In the Middle Bronze Age the settlement evidence at Parc Cybi is again very tenuous, but there are some radiocarbon dates, some very small undistinctive sherds and one good wooden round house with no date. The site at Llanfaethlu does not seem to have been occupied at this time.

2.4.33 Consequently, the Hotspots 11-13 and 14 and especially EV9 Field 9/9a are of considerable importance and should be studied and published in as much detail as the records allow. The quantity of Late Bronze Age metalwork from the island where, it should not be forgotten, there are copper mines of Bronze Age date, suggests that this was an important period in Anglesey's history and these sites, though not very rich in finds, have the potential to extend our knowledge of the economy of the period. It is probable that some of these settlements may have survived into the Iron Age.

2.4.34 The burnt mound sites should be looked at as a whole and used to further enhance the recent regional review carried out by Kenny (Kenney, J., 2012).

Iron Age (800 BC-AD 43)

Regional background

2.4.35 The transition from Bronze Age to Iron Age is now dated to the eighth century BC, the clearest archaeological indicator being the cessation of bronze hoarding and the use of iron implements. Despite the marked break in depositional practice, in most areas the evidence indicates considerable continuity across the transition. In Wales, however, pottery did apparently cease to be used altogether during the earlier 1st millennium BC.

2.4.36 Twenty years ago, there existed no regional research framework within which to place the evidence from Anglesey (Champion, T. C. *et al.*, 2001). Gwilt's 2003 paper has been followed by a number of reappraisals (Gwilt, A., 2003; IFA Wales/Cymru, 2008). Key sites listed in the research framework include a number of Late Bronze Age/Early Iron Age roundhouse settlements. A review of the settlement evidence for northwest Wales helps to put these in their appropriate context (Waddington, K. E., 2013). On Anglesey, an additional class of settlement can be identified in a small group of morphologically similar earthworks, for which the site at Bryn Eryr is the exemplar: rectilinear earthworks enclosing medium to large settlements, occupying generally low-lying locations. Such sites are a product of the agricultural potential of the region, since they have not been found in more marginal area. Excavations at Bryn Eryr and Bush Farm have shown chronological and structural development on the same site, continuing occupation from the Iron Age into the Romano-British centuries. Equally, the field systems that survive in association with farms have the potential to illustrate economic and land management changes through time.

2.4.37 Evidence for formal burial during later prehistory is generally rare over much of Britain during this period. In north-west Wales it is very rare. While in Wales, a number of cremations have been dated to the 1st millennium BC (Champion, T. C. *et al.*, 2001), consideration should be given to the possibility that the remains of the dead, cremated or otherwise, were committed to the waters of rivers, lakes and marshes accompanied by the large quantity of high-status metalwork that has been dredged from, for example, the major river systems of southern Britain.

2.4.38 The earliest iron artefacts appear in Wales (at Llyn Fawr, Glamorgan; and in Denbighshire) at a time when the typical late bronze assemblages were still in production, during the 8th -century BC. Objects, such as the socketed axe, sickle and spearhead, are essentially bronze forms recreated in the new metal. We must assume that iron became the metal for all major tools and weapons quite rapidly. Nevertheless, with the exception of a single iron ring-headed pin from the hillfort of Din Silwy, Llanfihangel, Anglesey, there is a complete dearth of evidence for both bronze and iron artefacts in north-west-Wales during the earlier part of the conventional Iron Age. It is unclear whether this state of knowledge is a real reflection of the past reality. There is, at present, evidence of imported iron of the very earliest Iron Age in north-west-Wales.

2.4.39 Considerably more material is known from the Later Iron Age, in its Bryn Eryr/Bryn y Castell phase, between the 3rd century BC and the 1st century AD. Even then, the greater part of our evidence derives from a handful of key sites, in particular, the votive deposit at Llyn Cerrig Bach (48 bronze and 63 iron artefacts) and the major iron smelting and smithing workshops at Crawcwellt (an estimated 23 smelting furnaces producing about 0.5 tonnes of fully refined bar iron), and Bryn y Castell. Iron was generally reserved for tools, weapons and robust items. Bronze was the metal of choice for fasteners and fittings, where intricacy of form, detail and decoration were more important than strength.

2.4.40 A major research question concerns copper alloy sources; the use of local raw materials has been demonstrated in certain areas like north Wales (Musson et al 1992, 277-80). A key sites is Llyn Cerrig Bach, Llanfair-yn-Neubwll, Anglesey. Here, a votive deposit in small lake near RAF Valley was discovered in 1943. Almost two hundred pieces of equipment, including weapons and elements of horse harnesses and chariots, was found. Deposition probably took place from 3rd century BC until the Roman invasion.

2.4.41 Saddle querns and mortars are indicative of the processing of grain and other foodstuffs and cereals are a component of the environmental evidence. The evidence retrieved from environmental sampling is sparse and animal bone assemblages very rarely survive well. At Bryn Eryr, both cattle and sheep were present. At Segontium, during the Roman period, cattle were an important component of the food resource, drawn presumably from pastures within the region. This aspect of the agricultural

regime is perhaps under-represented or not fully recognised in the evidence for later prehistory.

Iron Age evidence from Wylfa Newydd

2.4.42 Two Iron Age settlement sites of Very High significance were excavated at Area 20 and HS 15, with strong additional evidence recorded at Area 19 and Area 9. The settlements sites are comparable to the familiar round stone 'huts' seen at Ty Mawr, and Porth Dafarch on Holy Island, excavated in the 19th century by W.O Stanley, and at many other sites on Anglesey. Early Iron Age radiocarbon dates were returned from Area 20, 19 and HS 15. Despite the significant Late Bronze Age settlement evidence encountered nearby, however, direct overlap with the settlement pattern of the Late Bronze Age was not apparent. Clear evidence of continuity of Iron Age settlement into the Roman period was more common, with Area 19 being the only one of the four at which Roman activity was not recorded.

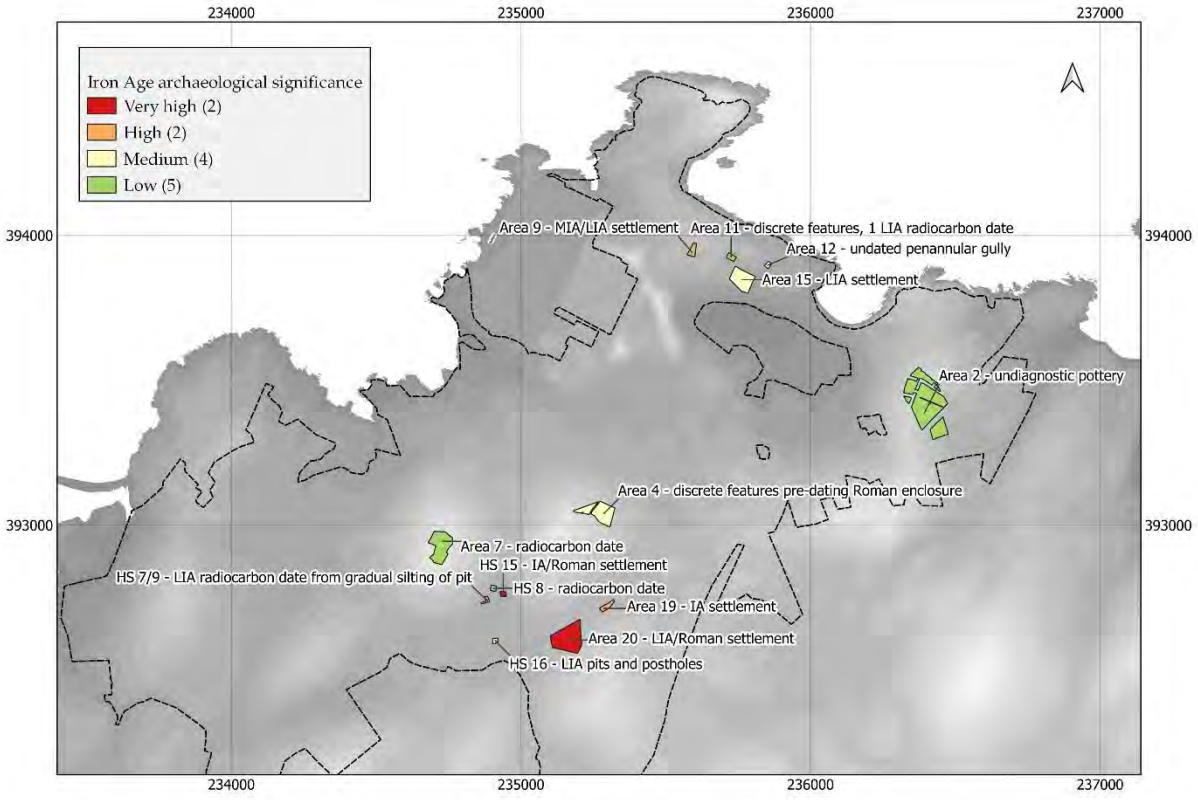

Figure 7 Significance of Iron Age evidence recovered from the 32 excavation sites

2.4.43 Evidence of funerary activity was not identified, with additional Iron Age evidence being limited to discrete pits and post-holes, occasionally radiocarbon dated, which remain difficult to characterise further. At five sites of Medium significance, these features may have been indicative of settlement nearby. At further four sites the evidence was more difficult to interpret.

Significance and potential of the Iron Age evidence

2.4.44 The four main settlement sites identified are of considerable importance for understanding the archaeology of Iron Age Anglesey.

2.4.45 If pottery from the Iron Age is even rarer on Anglesey than that from the Bronze Age. The same is generally true across North Wales as a whole. It is just possible that there might be a fragment of Cheshire Salt Container at Area 9, and perhaps also at Hotspot 15. They should be sent to Elaine Morris.

2.4.46 Two of the sites Area 20 and Hotspot 15) are overlaid by stone structures. At Areas 2 and 3 there are some Romano-British finds, but no recognisable structures, and Area 9 has produced a Roman radiocarbon date.

Research framework recommendations

2.4.47 Relate undefended settlement to defended sites; are they contemporary. Desirable to understand changes in agricultural base of economy through environmental sampling. Identification of metal working sites a priority.

Roman period (AD 43-410)

Regional background

2.4.48 Roman military presence in NW Wales from the campaign of Suetonius Paulinus in AD 60/61, mentioned by Tacitus (*Agricola* 14; *Annals* XIV, 29-30). We learn from Tacitus that Anglesey was later subjected to Roman rule (*Agricola* 18). The fort of Segontium, excavated in the 1970s, was founded by Agricola in AD 77/78.

Romano-British evidence from Wylfa Newydd

2.4.49 Three settlement sites are deemed to be of Very High significance. Two with good preservation of structural remains and material culture in the valley bottom (Area 20 and HS 15). The third site, Area 4, possibly originated as a fortlet, but has evidence of

continued use into the Late Roman period. The site is situated on the brow of a hill. Partly within the excavation area were the remains of a defensive enclosure. Radiocarbon dates suggest the ditches were still silting up in the Early Medieval period. Settlement evidence of High significance was also recorded at Area 9 and Area 15, with several kilograms of industrial waste indicative of metal working recovered from the latter site.

2.4.50 Two sites were allocated to Class 3, Medium significance. A sample from the fill of a stone-lined well in HS 7/9 returned a radiocarbon date in the Roman period. The fills of settlement features recorded in HS 16 returned dates within the Late Iron Age and Roman period.

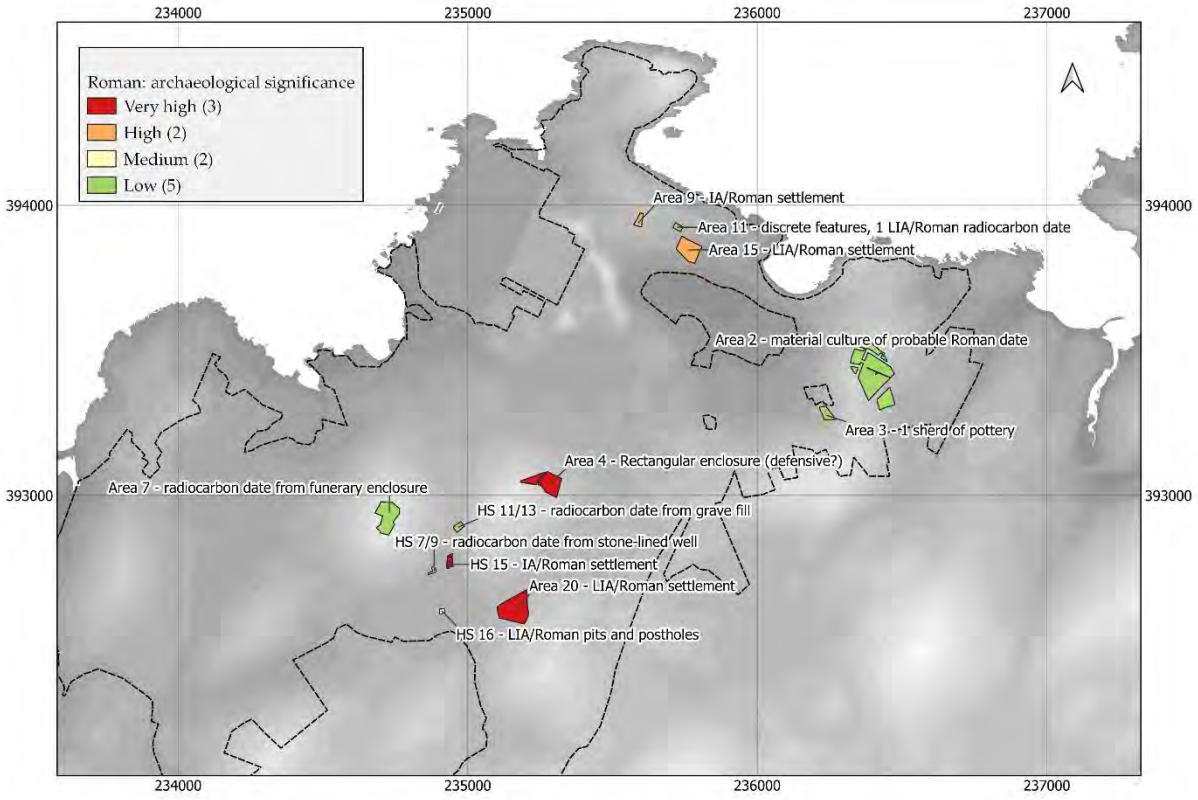

Figure 8 Significance of Romano-British evidence recovered from the 32 excavation sites

2.4.51 Roman pottery was recovered from seven sites: the largest quantities at Area 15, Area 20 and HS 15 (more than 50 sherds), moderate quantities at Area 4 and Area 9 (fewer than 50 sherds), and tiny amounts at Area 2 and Area 3 (fewer than five sherds).

2.4.52 The latter two sites have therefore been classed as of 'Low' significance for the Roman period, along with three others (Area 7, Area 11 and HS 11/13), where radiocarbon samples returned dates within the Roman period but little other supporting evidence exists.

Early Medieval (AD 410-1066)

Regional background

2.4.53 In spite of hugely important themes, such as the end of Roman rule and the spread of Christianity, we know very little archaeologically about the population of Early medieval Wales. After the relative richness and visibility of the Roman period the rarity of distinctive artefacts and settlements poses immediate problems. Wales, like much of the rest of Britain, has no native ceramic tradition in the first millennium AD; consequently site recognition and dating by field walking, even when following up on cropmarks, is virtually impossible (IFA Wales/Cymru, 2008). Radiocarbon dating, alongside the few distinctive types of artefact, such as brooches, is at the moment the only way to distinguish Early medieval settlement from earlier periods. Until recognisably Early medieval site types are identified, it is difficult to ask more nuanced research questions.

Early medieval evidence from Wylfa Newydd

2.4.54 At Area 15 a large Early medieval cemetery was found cut into the remains of a settlement that was occupied in the Late Iron Age and Romano-British periods (and perhaps later). Of the 316 graves, 109 graves produced human remains. Samples of the human remains have allowed the cemetery to be radiocarbon dated to 5th to 8th centuries AD. The minimum number of individuals (MNI) observed within the assemblage is 121 (Butler, C. and Madgwick, R., 2020, p. 28). The number is higher than the number of graves producing human remains because a small amount of disarticulated bone was recovered from some of the grave fills. This is a result of a minority of the graves cutting through earlier burials, a normal phenomenon is many cemeteries. In most cases the human remains had not survived due to acidic soil conditions. The state of the preservation of the surviving human remains is very poor, and often only a small percentage of the skeleton has been recovered. The wet sieving of environmental samples recovered a small quantity additional human remains, mainly teeth, which allowed three extra individuals to be counted (Butler, C. and

Madgwick, R., 2020, p. 29). The majority of the graves were of the 'long cist' type, with only 48 showing no sign of stone lining. Graves of a similar type were excavated at HS 11/13 (19 graves) and Area 7 (51 graves), but at both these sites no trace of human bone survived. Indeed, in the context of the region the state of preservation of the human remains at Area 15 is remarkably good and will allow a range of scientific techniques to help characterise the origin, mobility and diet of the Early medieval population.

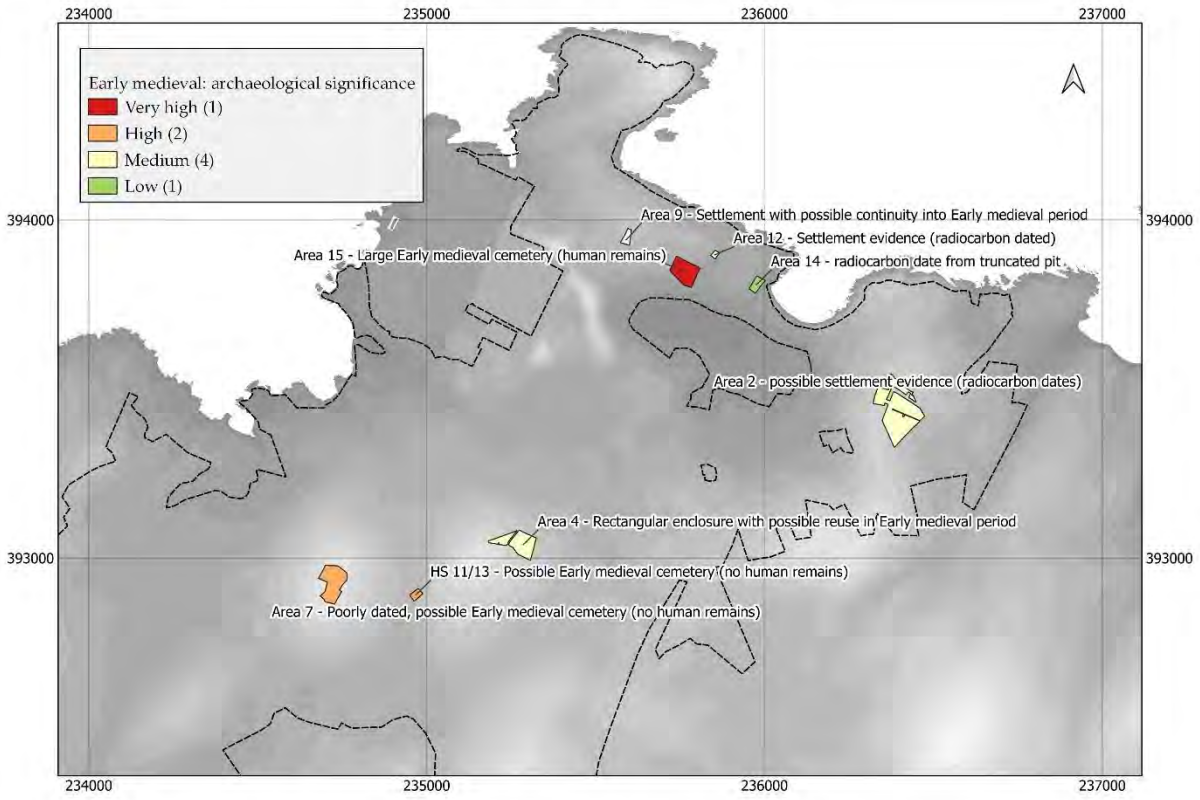

Figure 9 Significance of Early medieval evidence recovered from the 32 excavation sites

2.4.55 In keeping with regional trends observed in the Research Framework (IFA Wales/Cymru, 2008), Early medieval settlement proved very difficult to detect within the development area. Only thanks to radiocarbon dating have a couple of sites been identified. The absence of diagnostic artefacts on these sites would otherwise have led to the assumption that they were occupied only during prehistory. This is the case with Area 12 and possibly Area 2 (although at the latter site prehistoric activity is also proven by a significant assemblage of lithic artefacts). Radiocarbon dating at Area 9, a settlement with an assemblage of Roman pottery, also hints at the possibility of

continuity of the settlement from the Late Roman to Early medieval period. At Area 4 there appears to have been activity beyond the end of the Roman period, which was not simply the gradual silting of the ditches of the defensive enclosure. Here, a copper alloy penannular brooch was recovered which, while being not closely datable, is most likely to have been produced in the Early medieval period. It is the only find identified as Early medieval during the assessment phase. Finds recovered from the graves from the three cemetery sites, for example, are not thought to have been grave goods, or necessarily contemporary with the period of burial.

2.4.56 The existence of Early medieval settlement in close proximity to the large Early medieval cemetery site excavated at Area 15 (at Area 9 and Area 12) makes sense. One would expect the cemetery to have served nearby settlements. Evidence for continuity of occupation at the Late Iron Age and Romano-British settlement excavated within the limits of Area 15 should also be carefully examined. Evidence of continuity at the only defensive enclosure identified within the development area also has logic to it.

Significance and potential of Early medieval evidence

2.4.57 The human remains assemblage from Area 15 has one of the highest MNI values of any Early medieval assemblage in NW Wales and is of considerable research importance. It provides the opportunity to shine a narrow spotlight on a period otherwise shrouded in darkness. The research framework highlights the need for the examination of similarities and differences between cemetery populations (IFA Wales/Cymru, 2008). The assemblages of human remains from rescue excavations funded by Cadw at cemeteries in NW Wales, because of the threat of destruction through coastal erosion, provide comparative material for the assemblage of human remains excavated at Wylfa Newydd Area 15. Sites with which to compare the Area 15 are listed in the 2017 Early medieval refresh of the Research Framework for the Archaeology of Wales (IFA Wales/Cymru, 2008).

2.4.58 Strontium and oxygen isotope analysis has revealed aspects of population mobility between Wales, England, Ireland and Scandinavia in the Early medieval period. Carbon, nitrogen and sulphur isotope analysis provides an indication of the dietary resources consumed by each sampled individual, and from this the use of resources by the wider population. Such evidence can shed light on the consumption or

otherwise of natural resources and agricultural practice in early medieval Wales, for example, the use of seaweed as a consumable resource by people and animals as well as a fertiliser (Hemer, K. A. *et al.*, 2016). In the future it is also important that isotope analysis of animal bone is considered to complement that undertaken on human skeletal remains. Isotope analysis of skeletons from coastal sites at Brownslade, West Angle, St Patrick's Chapel and Porthclew, Pembrokeshire, suggest that marine protein was not a significant contributor to the diet, though small amounts of coastal fish and shellfish may, nevertheless, have been consumed in addition to freshwater species.

2.4.59 While the other evidence of Early medieval occupation in the development area is comparatively poor, in the context of a period about which very little is known it is nonetheless important. The Early medieval evidence thus deserves to be published alongside the other archaeological evidence from this phase of Wylfa Newydd excavations, to give a view of the long durée of human development on this part of Anglesey.

Medieval (AD 1066-1540)

Regional background

2.4.60 The desk-based baseline study found that evidence for medieval settlement within the development area was known from documentary sources, although from the 12th century the development area and its immediate vicinity contained the townships of Cemais, Clegyrog, Llanfechell and Caerdegog, and the hamlets of Cafnan, Tre'r Gof and Llanddygfael. The surviving field boundaries were thought to be Post-medieval in date, with the potential for detecting former medieval field systems close to the townships and hamlets known from the documentary sources.

Medieval evidence from Wylfa Newydd and its significance

2.4.61 Few archaeological features of confirmed medieval date were recorded during the excavation of the 32 areas. No pottery definitively dating to the medieval period was recovered and the emergence of a medieval field system could not be traced with any confidence. The medieval features were mainly been identified through radiocarbon dating. Five of the 125 radiocarbon dates achieved during the assessment were medieval, although one of these from HS 15 was problematic (the deposit being

stratigraphically earlier than another dated to the Late Iron Age/Romano British period). Another date was achieved from a grave fill and is not particularly trustworthy. Two sites have been categorised as having medieval archaeological features of Medium significance. At Area 2, two features associated with metal working were dated through radiocarbon samples. At HS 6 sample from the fill of an enclosure ditch returned a medieval radiocarbon date.

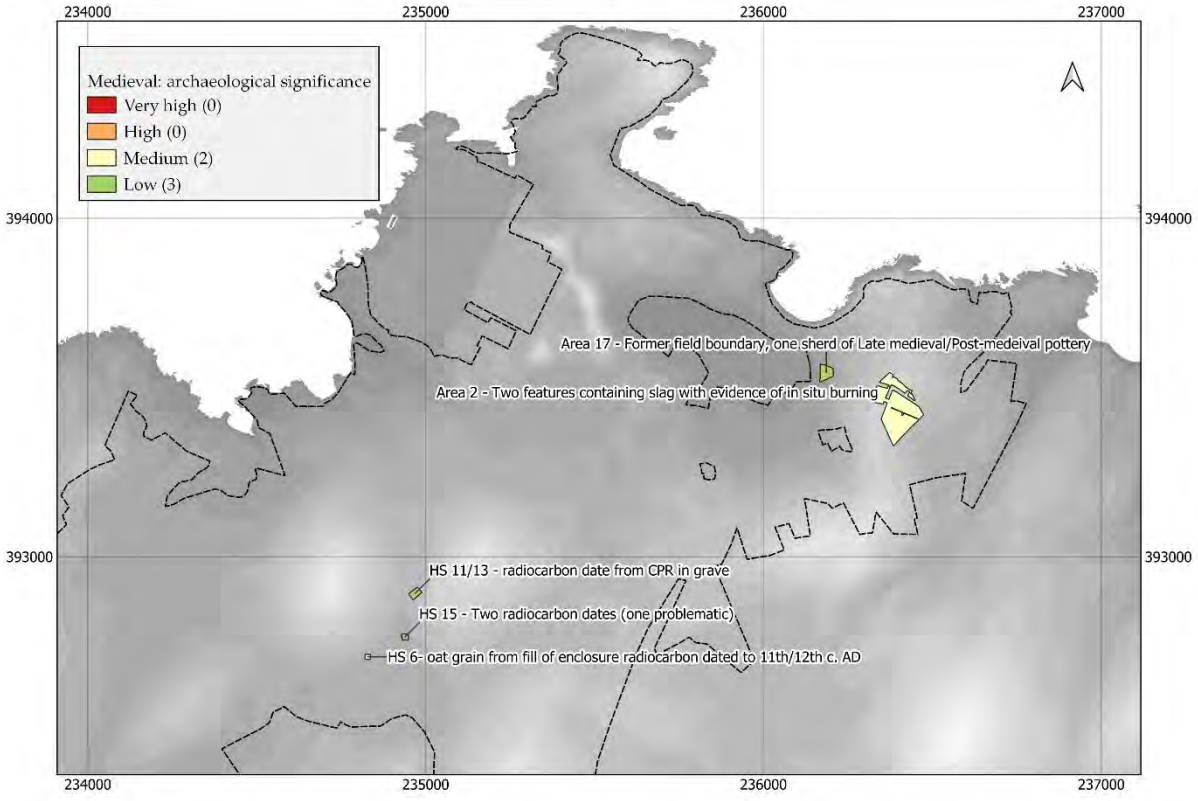

Figure 10 Significance of medieval evidence recovered from the 32 excavation sites

2.4.62 Little of importance can be said of the medieval archaeology recorded during the project. Nonetheless, the evidence should be briefly stated in a publication covering the full timescale of the recovered evidence.

Post-medieval to Modern (AD 1540-present)

2.4.63 Sixteen of the sites yielded small assemblages of Post-medieval pottery, which are of low archaeological significance. Post-medieval field boundaries were encountered within ten of the excavation areas. An effort should be made during the analysis phase

to compare this evidence with the that collected during the desk-based hedgerow survey (McNicol, 2015).

2.5 Significance and quantification of archaeological assemblages

2.5.1 This section gives brief overview of the relative quantity of finds recovered from the different sites. Figure 11 plots the number of sites at which each material type was found, against total weight recovered. It gives a visual impression of the overwhelming importance of stone objects in the archaeological record of this area. Ceramic assemblages, where present, were not large. This attests to a reliance on wooden vessels, or vessels made of other perishable materials throughout much of human history in this region.

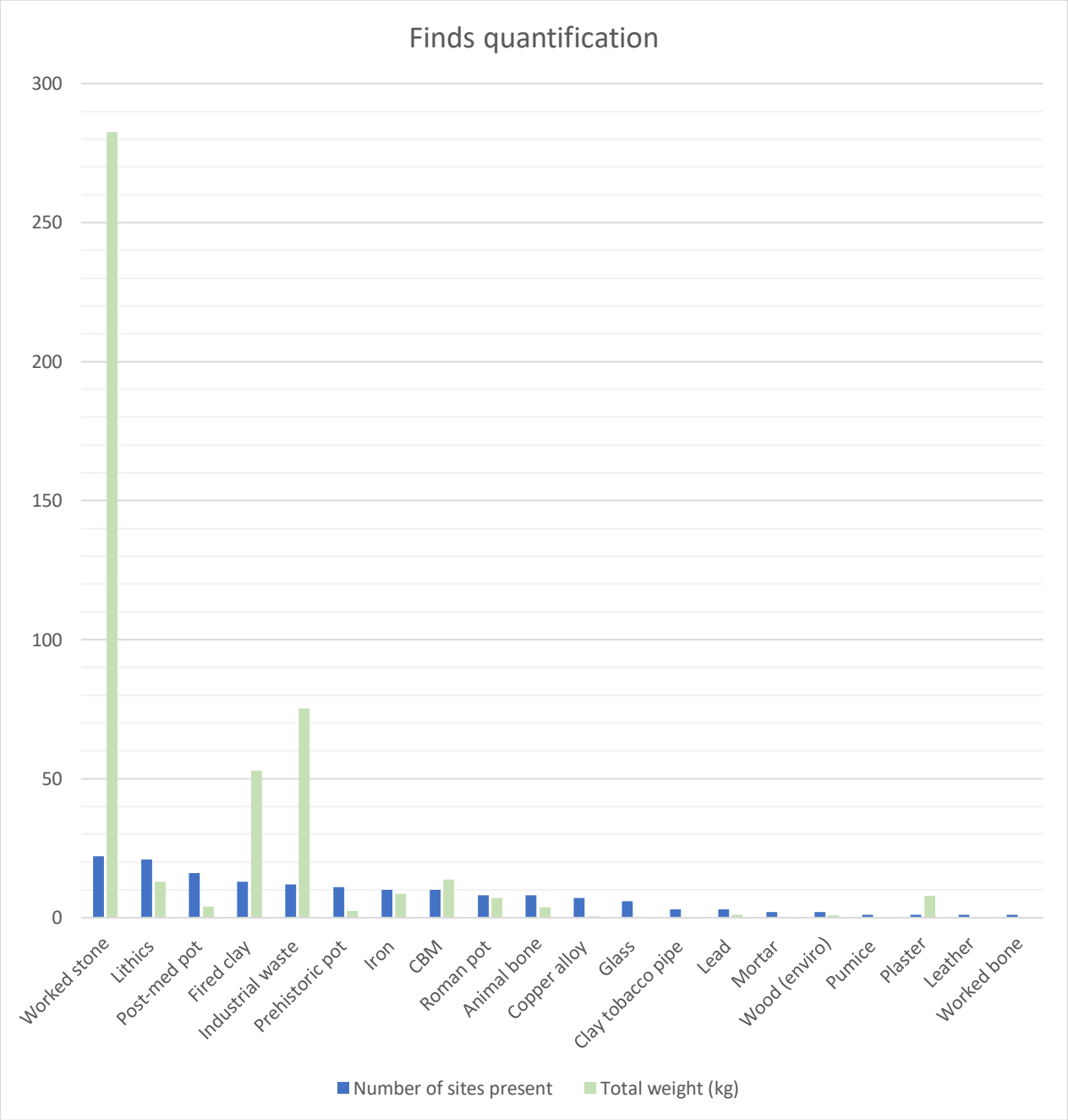

Figure 11 Finds quantification (excludes slate)

2.5.2 The small quantity of metal finds attests to the importance of past reuse and recycling.

2.5.3 The same data is presented in in Table 7, which also makes clear which sites produced the most material in each case. Individual site quantification tables are produced in Chapter 3 and Appendix 3 also includes a detailed quantification of the finds organised by site. The table shows the how common each category of find was. Worked stone was found to be most commonly found, present on 22 of the 32 sites. The next most

common was Lithics, followed by Post-medieval pottery, Fired clay and Industrial waste. In general finds were in very low quantity and this has led to a heavy reliance upon radiocarbon dating for establishing chronology. The finds will, however, contribute discussion on the subjects of textile manufacture, personal adornment, animal husbandry, agricultural processing and other aspects of human activity. More will be able to be said on these subject by comparing across the 32 excavation sites and with regional datasets than on an individual site basis. For this reason it is recommended that finds specialists are brought together in order to re-examine and discuss all of the material in relation to the stratigraphy of the sites.

Table 7 Finds quantification

Category	Number of sites	Total weight (kg)	Total count	Max weight (kg)	Max as %	Top sites
Worked stone	22	282.5	465	115.392	41	Area 20, Area 15, Area, Area 5, HS 15
Lithics	21	12.86	942	5.028	39	Area 14, Area 15 and Area 20
Post-med pot	16	3.94	305	2.118	54	Area 15, Area 20 & HS 12
Fired clay	13	52.898	654	21.128	40	HS 15, Area 15 & Area 20
Industrial waste	12	75.348	821	34.635	46	Area 20, Area 2 & HS 15
Prehistoric pot	11	2.317	904	1.386	60	EV9 (Field 1 & 2)
Iron	10	8.621	386	1.347	16	Area 20 and Area 15
CBM	10	13.738	99	7.354	54	HS 15, HS 5, Area 15
Roman pot	8	7.069	492	4.837	68	Area 15, Area 20 & HS 15
Animal bone	8	3.815	808	3.6	94	Area 2
Copper alloy	7	0.54	88	0.194	36	Area 20 and Area 15
Glass	6	0.304	44	0.113	37	Area 15, Area 5 & Area 4
Clay tobacco pipe	3	0.046	18	0.044	96	Area 15
Lead	3	0.953	21	0.9	94	Area 15
Slate	2	1352.651	167	1248.192	92	Area 15, Area 7
Mortar	2	0.2	21	0.186	93	Area 15
Wood (enviro)	2	0.9	18	0.6	67	Area 20 & HS 16
Pumice	1	0.023	2	0.023	100	Area 7
Plaster	1	7.9	1	7.9	100	Area 20
Leather	1	0.005	1	0.005	100	Area 20
Worked bone	1	0.089	60	0.089	100	HS 15

2.5.4 Figure 12 shows this information in a series of bar charts located on a map. Each bar chart is positioned roughly over the location of each excavation area. Figure 13 and

Figure 14 gives the same information but at a larger scale for the eastern and western groups of sites respectively.

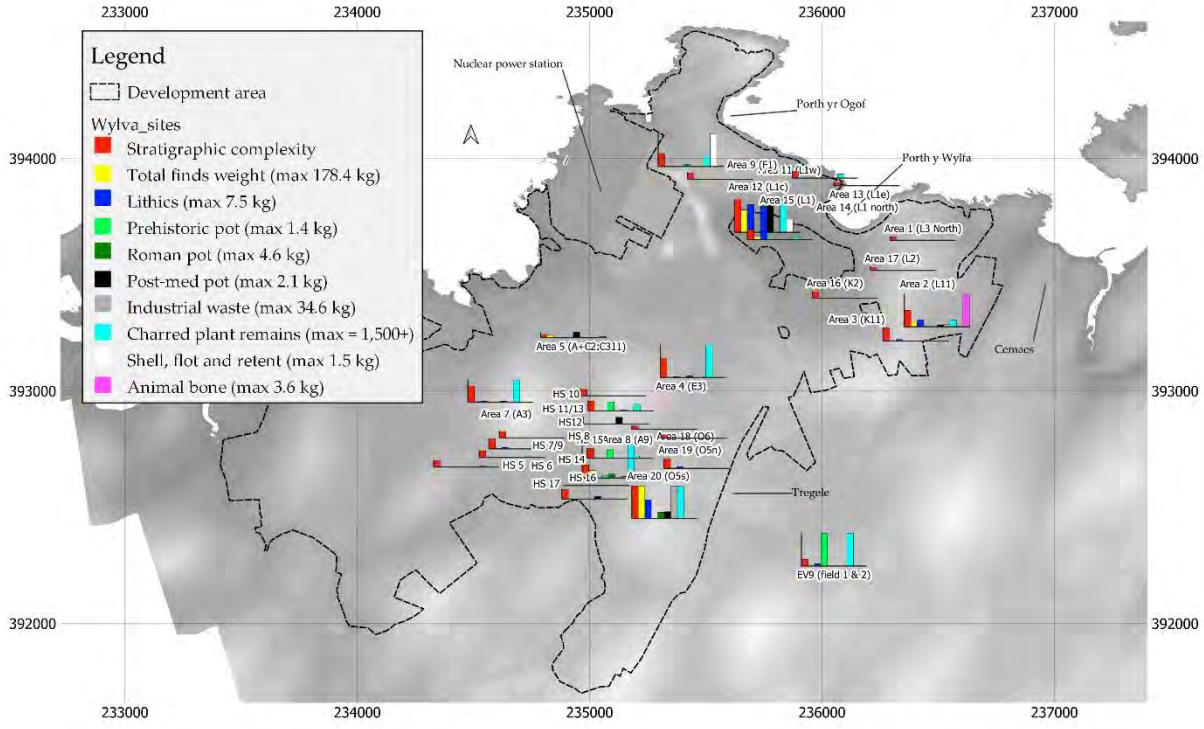

Figure 12 Inter-site comparison of finds quantity by relative weight (tallest bar = weight value of site with heaviest assemblage)

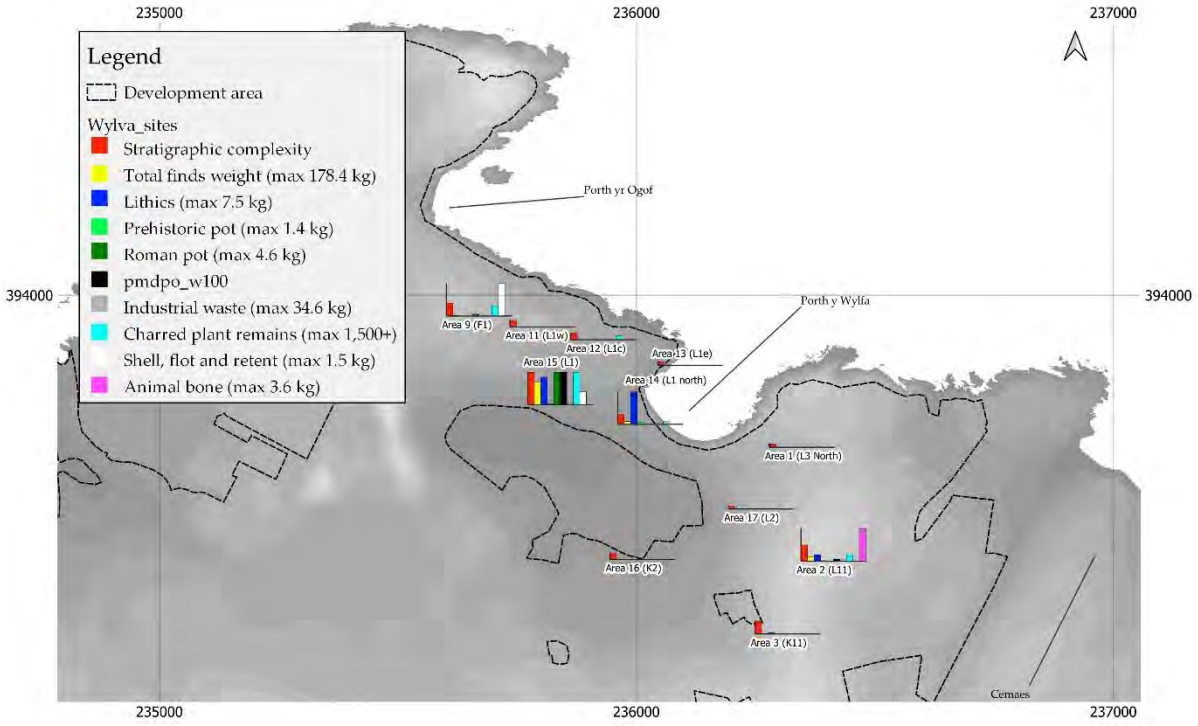

Figure 13 Inter-site comparison of finds quantity by relative weight (tallest bar = weight value of site with heaviest assemblage)

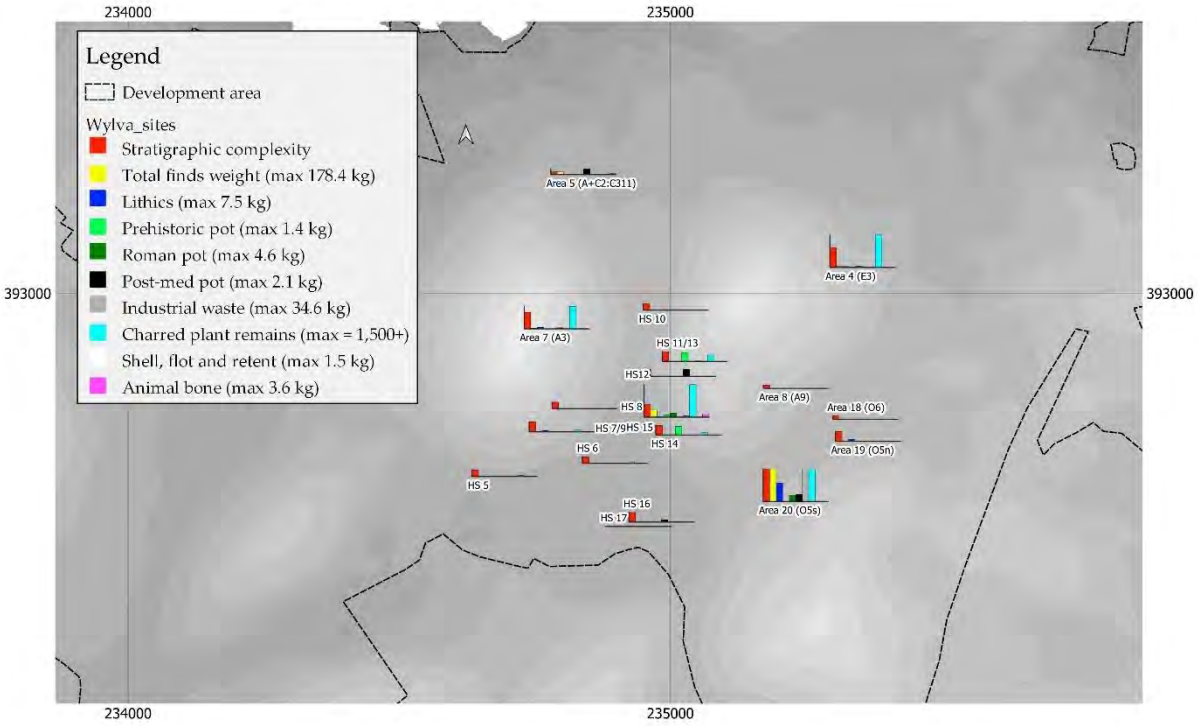

Figure 14 Inter-site comparison of finds quantity by relative weight (tallest bar = weight value of site with heaviest assemblage)

2.5.5 The environmental sampling also has the potential to contribute our understanding of woodland management and in a few cases crop-processing and storage. The acidic nature of the soils, however, led to very poor preservation of animal bone and other ecofacts. In most cases only the charred plant remains and charcoal are possible to study in further detail. Only Area 2 has an assemblage of animal bone which might be worthy of further study.

2.5.6 Evaluation of the significance of the for Finds and Ecofacts assemblages made on a site by site basis is included in the next chapter. It is also made clear which assemblages are recommended for further specialist analysis. Details of the assessment of the monolith samples recovered from Area 4 and HS 1/13 are also included there.

3 POST-EXCAVATION ANALYSIS RECOMMENDATIONS

3.1.1 As stated in Chapter 1, this Updated Project Design follows on from a previous stage of 'Post-excavation Assessment' undertaken by Wardell Armstrong LLP, during which assessment reports were produced for 32 excavation areas. This section includes a brief summary of the findings from each of the 32 sites drawn partly from these reports and partly from a six-week period in which a team working on the production of the UPD reviewed the data. This is followed by a task list of the further work necessary for the final archive report to be completed and for publication of the results to follow. The sites are not dealt with in numerical order. Rather, the sites of very high significance, needed an extensive amount of further work, come first. These are followed by those of high significance, medium significance, and so on. Finally, two sites at which little, or nothing, of archaeological significance was found are reached at the end of the chapter (Hotspots 12 and 17). No further work is recommended for these two sites.

3.1.2 Each archaeological site is presented under a series of headings. The archaeological periods for which evidence of activity has been found are given first, followed by a brief site description. Recommendations are then given relating to further stratigraphic analysis, artefact assemblages, ecofact assemblages, radiocarbon dating and, finally, research considerations. With the exception of the three EV9 cable diversion sites, which are quantified together, finds quantification tables are given for each site. Each artefacts section includes a quantification table which also identifies the significance of each category of find. The same system of categorisation that is given in the previous chapter: Very high, High, Medium, Low and None.

3.1.3 The recommendations given here should not be considered to be exhaustive, or in every case mandatory. They are a guide, which will help those chosen to undertake to post-excavation analysis and publication work understand the nature and composition of the existing archive.

3.2 The four Class 1 sites (of very high archaeological significance)

Area 15

Periods

Mesolithic, Early Neolithic, Early Bronze Age, Iron Age, Roman, Early Medieval

Site summary

3.2.1 A multiperiod site containing archaeology from the Neolithic, Late Iron Age, Roman and Early medieval periods. Human remains from the Early medieval cemetery returned radiocarbon dates ranging from the 5th to 8th century AD. The 316 excavated graves were well spaced out, with very little intercutting. Apart from a modern east-west aligned field boundary which cut through the middle of the cemetery, the site had suffered very little truncation. One-hundred-and-nine of the graves contained human remains. The inclusion of disarticulated bone in some graves and the recovery of additional bone through the wet-sieving of environmental samples raised the MNI count to 121 (Butler, C. and Madgwick, R., 2020, p. 28). There is little indication that any of the finds from the graves were intentionally deposited as grave goods. A pit containing Neolithic toolkit, including three axe heads and areas of burning was radiocarbon dated to the Neolithic. A hiatus in activity was then followed by the construction of a Late Iron Age to Late Roman settlement. Settlement features include a possible roundhouse associated with a large patch of burnt daub, a stone boundary wall, boundary ditches, fence lines and other post-built structures.

Stratigraphy

3.2.2 During the assessment stage, four separate stratigraphic matrices were produced for the site using Harris Matrix Composer v2.0b: one for the Late Iron Age/Romano-British settlement, one for a dense part of the cemetery thought to be its early core, one for the rest of the cemetery and one for post-cemetery features. The stratigraphy is not highly complex, but further work is necessary on the stratigraphy of Late Iron Age and Romano-British settlement and the Early medieval cemetery. The possibility of continuity of the settlement from the Late Roman period into Early medieval times needs to be explored with detailed reference to the finds and additional radiocarbon dates. There were a few clusters of the excavated graves which cut into one another. Should human bone be present from a group of graves with a clear stratigraphic sequence, it will be important to examine whether anything more sophisticated can be done with radiocarbon dating.

3.2.3 The archaeological features will need adding to the project GIS and further plans producing. Clearer phase plans are needed, along with detailed plans of groups of graves and settlement features with relevant context numbers labelled. A GIS will

make possible analysis of patterns arising from the osteological analysis of the human bone.

Artefacts

3.2.4 Area 15 had the largest assemblage of finds from the Wylfa Newydd excavations. Table 8 provides a quantification of the various material types recovered and an indication of their research significance. In contrast to the methodology employed by Wessex Archaeology, Brython Archaeology used a collection strategy in which almost all categories of find were located and treated as Small Finds. With the exception of the slate, the distinction between bulk finds and small finds is non-existent. The recommendations for further specialist work are given below.

Table 8 Quantification of finds assemblages from Area 15

Category	Significance	Bulk cnt	Bulk wgt	Env. cnt	Env. wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray
Prehistoric Pottery	High	0	0.000	1 to 10	0.013	6	0.045	6	0.058	Yes	Yes	Sue Thompson (WA)	No	No
Roman pottery	High	0	0.000	11 to 50	0.101	262	4.736	262	4.837	Yes	Yes	Sue Thompson (WA)	No	No
Fired Clay	High	0	0.000	51 to 149	5.444	168	7.774	168	13.218	Yes	Yes	Sue Thompson (WA)	No	No
Industrial Waste	High	0	0.000	150 to 249	10.245	682	23.873	682	34.118	Yes	No	Sue Thompson (WA)	No	No
Lithics	Very high	0	0.000	51 to 149	0.101	415	4.927	415	5.028	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	Very high	0	0.000	11 to 50	0.746	161	95.252	161	95.998	Yes	Yes	Sue Thompson (WA)	No	No
Slate	Low	153	1,248.192	0	0.000		0.000	153	1,248.192	No	No	Megan Stoakley (WA), Mike Mann	No	No
Iron	Medium	0	0.000	11 to 50	0.057	275+	5.011	275+	5.068	Yes	Yes	Sue Thompson (WA)	Yes	Yes
Copper Alloy	High	0	0.000	11 to 50	0.020	59	0.162	59	0.182	Yes	Yes	Sue Thompson (WA)	Yes	Yes
Lead	Medium	0	0.000	0	0.000	19	0.900	19	0.900	Yes	Yes	Sue Thompson (WA)	No	No
Glass	Medium	0	0.000	11 to 50	0.015	28	0.098	28	0.113	Yes	Yes	Sue Thompson (WA)	No	No
Clay Tobacco Pipe	Low	0	0.000	1 to 10	0.001	17	0.043	17	0.044	No	No	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	0	0.000	1 to 10	0.010	193	2.108	193	2.118	No	No	Sue Thompson (WA)	No	No
CBM	Low	0	0.000	0	0.000	3	1.101	3	1.101	No	No	Sue Thompson (WA)	No	No
Charcoal	Low	0	0.000	0	0.000	41	0.018	41	0.018	Yes	Yes	Sue Thompson (WA)	No	No
Coal	None	0	0.000	0	0.000	2	0.039	2	0.039	No	No	Sue Thompson (WA)	No	No
Mortar	None	0	0.000	0	0.000	24	0.183	24	0.183	No	No	Sue Thompson (WA)	No	No
Shell	Low	0	0.000	0	0.000	53	0.081	53	0.081	Yes	Yes	Sue Thompson (WA)	No	No
Pottery (unknown date)	None	0	0.000	0	0.000	10	0.069	10	0.069	No	No	Sue Thompson (WA)	No	No
Heated stone	Medium	0	0.000	11 to 50	0.530		0.000	-	0.530	Yes	Yes	Freddie Lowrie-Sisson (WA)	No	No
Magnetically responsive	Medium	N.A.	N.A.	N.A.	0.484	N.A.	N.A.	N.A.	0.484	Yes	Yes	Freddie Lowrie-Sisson (WA)	No	No

Prehistoric Pot

3.2.5 Six sherds of Neolithic pottery weighing 45g were recovered from the archaeological investigation at Wylfa Head / Area 15. Three samples, <**643**>, <**689**> and <**1616**> contained possible prehistoric pottery. Further analysis is warranted on the prehistoric pottery sherds, including refined fabric analysis and comparative research. Diagnostic sherds should be illustrated. The prehistoric pottery should be analysed and discussed alongside prehistoric pottery assemblages from the other Wylfa sites as part of a wider landscape survey, including sites HS 7-9, HS 11-13, EV9 and HS 15. SF**861** retained traces of internal sooting or residue; this residue may be suitable for lipid analysis. Further analysis will enhance research areas such as settlement patterns in the early prehistoric periods.

Roman Pot

3.2.6 One of the larger assemblages of Roman pottery (n = 262 sherds, 4,635g) was recovered from Area 15. The vast bulk of the pottery recovered from environmental samples comprised Roman sherds. A range of fabric types and vessel forms is present and the assemblage spans the late 1st to 3rd centuries. Further analysis is recommended on the Roman pottery assemblage, including comparative research with other Wylfa Roman pottery assemblages (including Areas 4 & 20 plus HS 15) as well as Roman archaeological sites in the wider landscape. Illustration of all diagnostic sherds, including sherds with pot repairs, should be illustrated. Further analysis will enhance research areas such as settlement patterns and manufacturing technologies.

Fired Clay & Industrial Waste

3.2.7 Over 34kg of industrial waste was recovered from Area 15 and *c*. 13kg of fired clay fragments were recovered from environmental samples. Several convex objects including SF**596**, SF**767**, SF**1459**, SF**1534** and SF**1790** may be hearth cakes. Full analysis is recommended on the industrial waste; the fired clay, although in less significant quantities, should be mentioned in the analytical text. A programme of XRF analysis may be warranted on the industrial waste to ascertain the composition of the slags and allow an understanding of any processes involved in local technologies and industries. Illustration of the industrial waste is not recommended; only recognisable daub fragments should be illustrated, e.g. those with discernible surfaces, thatch / wattle impressions or thumb / finger-prints. Radiocarbon dating of palaeoenvironmental material recovered in conjunction with the industrial waste or fired clay may help tighten the date range, which was stated as Late Iron Age to Roman

in the original post-excavation assessment report. Further analysis of this material will contribute to research areas such as industrial practices and manufacturing technologies.

Lithics

3.2.8 A highly significant assemblage of 415 flints (4,926g) was recovered during excavations at Area 15. A total of 82 pieces were recovered from environmental samples. Mesolithic/Early Neolithic material is represented by 142 blade-based removals; which make up 34.2% of the unretouched removals, suggesting that a substantial proportion of the assemblage is of this broad date. Surviving cores are dominated by multi-platform pieces. The remainder of the assemblage consist of flake-based material - some of which must represent less diagnostic element of Mesolithic and Early Neolithic technologies, but much of which is likely to be of later date, being characteristic of later Neolithic. The fifteen retouched pieces from Wylfa Head account for a relatively low (3.6%) of the assemblage. They are dominated by scrapers with three types represented, circular, side-scraper, and thumbnail. Two knifes fragments both made on longer flakes. Other retouched tools in the assemblage are two microliths, both scalene and one burin. A clearly-defined Neolithic tool kit was recovered from the fill of Pit **10.0008** and it consists of two flaked axes manufactured from Graig Lwyd stone, probably from the close axe factory of Penmaenmawr.

3.2.9 The site has produced a significant lithic assemblage and should be reported on in full. This will give an opportunity to explore diverse themes relating to the nature, significance and scale of flint and chert technology and its use, both at the site and within the wider landscape. Such themes include, but are not limited to:

- The chronology of flint and chert use at the site and continuities or disruptions in flint-working traditions across the transition Mesolithic/Neolithic, choices made in the selection, acquisition and use of raw materials.
- Strategies and approaches were taken to lithic reduction the spatial and temporal organisation of lithic reduction and tool use, both at the site and within the wider cultural landscape
- The nature of the products and how these relate to the range of activities conducted at the site
- The nature of the deposition and discard of flint waste and useable products, and how these may relate to the wider concerns of the communities using them.

3.2.10 The significance of the flintwork merits it being published in some detail, alongside suitable illustrations. The publication text should include:

- A detailed description of the flint and chert assemblages and the technological strategies employed to make them, including metrical and technological analyses, in order to allow it to be understood in its own right and to enable comparisons with other contemporary assemblages from the region.
- A description of the range of products that may have been manufactured and uses to which they may have been put.
- A consideration of spatial and chronological variations within the typological and technological composition of the material to explore how flint production, use and discard was structured across the site;
- An account of raw material variability, the possible sources and the implications that this may have had for the movement of peoples and resources within the wider landscape;
- An account of the possible uses and significances of the re-used material from later features, along with any comparable material from the region.

3.2.11 Recommendations for Further Work. This should concentrate on a full and detailed re-examination of the material and should include:

- Recording in detail the typological, technological and metrical traits of the various significant assemblages, as well as the raw materials, condition and degrees of recortication.
- Refitting exercises combined with a detailed examination of the micro-debitage on selected suitable assemblages, in order to elucidate pre-depositional history and discards patterns of the material.
- High-power examination of selected debitage for micro-wear traces to assess the degree to which unretouched flakes and blades may have been used.
- An examination of the contextual and distribution patterns of the assemblages.
- A consideration of the assemblages' relationships with other deposited materials, such as bone, pottery etc.
- Discussing how the material compares and contrasts to other lithic assemblages from the region and the implications that this may have for broader settlement strategies and patterns of landscape exploitation.
- Research and compilation of Mesolithic and Early Neolithic assemblages from the region
- Research and compilation of raw material sources and products.

3.2.12 It should be noted that while the Area 15 flints merit a standalone report, they should also be considered alongside flint assemblages from the other Wylfa sites as part of a

wider cultural landscape survey. No further work is recommended on the 530g of burnt unworked stone.

Worked Stone

3.2.13 A highly significant assemblage of worked stone artefacts (n = 161, 95,252g) was recovered from Area 15. Twelve stone artefacts, including quartz pebbles, were recovered from environmental samples. The stone artefacts generally fit into two categories, including textile production and grain processing. The assemblage includes spindle whorls (n = 11), loom weights (n = 2), several polishing / rubbing / grinding stones, at least seven saddle querns, four rotary querns and a polished stone bead (SF **286**), which has been attributed a broad of Bronze Age to early medieval. Further analysis is recommended on the stone assemblage, including comparative research and illustration of all tools and domestic functional objects as well as bead SF **268**. It is suggested that only a selection of the rubbing / polishing stones is illustrated. Further analysis will benefit research areas such as domestic settlement patterns, technology and industry as well as artefact studies. As mentioned previously, a broad date of Bronze Age to early medieval was attributed to stone bead SF **286**; this artefact was recovered from fill (**10.0667**) of north-south linear [**10.0668**] (**F.372**). Further analysis on this artefact is recommended; more detailed comparative research with similar objects may refine the date range. Further analysis and discussion should also consider stone assemblages from the other Wylfa sites, including Areas 2 and 20 as well as HS 15 and EV9 as part of a wider landscape project.

Slate

3.2.14 A total of 153 slate slabs weighing 1,248,192kg were recovered during the archaeological excavation at Area 15. When the stores at Menai Bridge were visited, a context for at least 42 of the slabs could not be identified. This assemblage represents 10% of the total assemblage; 90% of the artefacts were recorded on-site and not retained. The slates comprise grave cist slabs, capping stones and possibly structural remnants. A range of materials was present, including schist, slate and mudstone. No tool-marks, dressing marks or graffiti were observed on any of the flat surfaces of the slate fragments; over 60% of the slates were unmarked. Possible chiselled / smoothed edges indicative of working was observed on c.26% of the assemblage, although these were dubious. Definite chiselled / smoothed edges were observed on only c.11% of the assemblage. The slates should be integrated and

discussed with the osteological section as part of the funerary landscape. It is recommended that the slates are not retained with the archive. The objects cannot realistically be used for ad hoc display purposes, although one complete grave should be kept in case appropriate display space in a museum or visitor centre can be arranged. Illustration is not recommended.

Iron

3.2.15 Over 275 iron artefacts, weighing 7,611g were recovered during the archaeological excavation at Area 15 and include nails and tacks, horseshoes, buckles, blades and tools. The metal artefacts were sent for x-radiography analysis and some conservation; the plates are as follows: K19/382-K19/395. A single small find (SF **1859**) comprising an iron socketed knife, underwent conservation. Further analysis is recommended on the iron artefacts of Roman to medieval date only; the post-medieval to modern iron artefacts should be mentioned briefly. Further analysis of the iron artefacts would benefit research areas such as domestic settlement patterns as well farming practices.

Copper Alloy

3.2.16 A total of 59 copper alloy objects, weighing 162g, were recovered during the excavation at Area 15. The copper alloy finds include personal items including brooches and pins, a finger ring, buttons and buckles, coins and unidentified fragments. The metal artefacts were sent for x-radiography analysis and some conservation; the plates are as follows: K19/382-K19/395. A copper alloy penannular brooch was recovered from Grave 48 (**10.1635**) <**1154**>. The copper alloy finds span the Roman to early medieval periods. Further analysis is recommended on these finds, including illustration and comparative research with similar objects. The discussion of these items would contribute towards particular research areas within the national Roman and early medieval archaeological framework, including Roman domestic settlement patterns and the detailed analysis of early medieval artefacts and their contexts and characterisation of site assemblages.

Lead

3.2.17 A total of 19 lead objects, weighing 900g, of Roman to medieval date was recovered during the archaeological excavation at Area 15. Most of the lead finds are weights. Further analysis on the weights is recommended, including comparative research and

illustration. Further analysis would benefit research areas such as domestic settlement patterns and husbandry studies as well as economies, as the weights may comprise fishing / line weights or possibly trading counter weights.

3.2.18 No further analysis is recommended on the miscellaneous and unidentifiable fragments.

Glass

3.2.19 A total of 28 glass artefacts, weighing 98g, was recovered from the excavation at Area 15. Seven complete and fragmented glass beads of varying colours were recovered as well as the rim of a large dish or bowl (SF **1383**). Fifteen glass artefacts were recovered from 15 environmental samples. They included five beads which were each recovered from grave fills (Grave 250 <**1067**>, Grave 295? <**717**>, Grave 317 <**1449**>, Grave 378 <**1454**> and Grave 390 <**1461**>). Tiny shards of possible vessel glass were also recovered. A single fragment of yellowish glass recovered from Grave 362 <**1384**>, appeared to display etched decoration. A broad date of Iron Age to early medieval has been attributed to this small assemblage. Further analysis on the beads and the vessel glass is recommended, to include comparative research and illustration. The recovery of these objects from the Wylfa Head cemetery site appears unique to the general Wylfa site complex; further analysis will enhance research areas within the funerary and ritual framework as well as domestic settlement studies, e.g. personal adornment and dress. The objects could be discussed alongside items of personal adornment from other Wylfa sites and from sites in the wider vicinity.

Ecofacts

3.2.20 Total samples 1,056 (3,394 tubs) 41,054 kg (26,036 l).

3.2.21 Further work is necessary on the charred plant remains and charcoal, but not on the shell or animal bone. Some fragments of oyster shell were identified, but in general the shell assemblage is too small and too fragmented to warrant further work examining dietary habits. A total weight of 1400 g of animal bone was recovered. The majority of this was either presented in small fragments or unsuitable to be assessed to species. The assemblage is likely to be from domestic food waste mixed into the backfill of the features.

3.2.22 Charred pant remains (CPR) were present in quantities above one hundred in forty-five samples. Samples for full CPR analysis based on being primary deposits and likely to inform on crop practices and diet are:

- Sample <1624> from fill (10.2343);Sample <1696> from fill (10.2063); Sample <1700> from fill (10.2631); Sample <1783> from fill (10.2904) which were all classified as black/dark layers
- Sample <1697> from floor (10.2082);
- Sample <1703> from occupation layer (10.2581);
- Sample <1764> from fill (10.2840) out of gully terminus [10.2703];
- Sample <1771> fill (10.2871) and <1772> from fill (10.2773) both classed as organic fills;
- Sample <1778> from deposit (10.2870);
- Sample <1786> from fill (10.2911) out of posthole [10.2910] and,
- Sample <1792> from spread (10.2530).

3.2.23 Of the remaining thirty three samples, seventeen were grave fills and like the charcoal were taken primarily for the recovery of human bone and can be discounted for ecofactual significance unless dated through absolute methods to assess the period to which they relate. The remaining sixteen samples were from areas of mixed deposits in later construction debris or backfills of features and can be discarded.

3.2.24 Forty-four samples yielded over 50g of charcoal which have potential for full analysis. Samples yielding charcoal which are suitable for analysis due to being likely primary deposits and can inform on woodland management and fuel procurement across Wylfa and the wider landscape are:

- Sample <1> from fill (10.0009) out of pit [10.0008], which contained three stone axes and has been radiocarbon dated to the Neolithic;
- Samples <1586> and <1605> both taken from fill (10.2294) in flue/hearth [10.2295];
- Sample <1612> from charcoal rich pit fill (10.2383);
- Sample <1618> from fill (10.2300) out of possible flue [10.2301];
- Samples <1624> from fill (10.2343) and <1637> from (10.2433) were both taken from unnumbered charcoal spreads;
- Samples <1642> from fill (10.2453) and <1643> from fill (10.2454) both taken from burnt area [10.2443];
- Sample <1703> from occupation layer (10.2581);
- Sample <1706> from charcoal rich fill (10.2688);

- Sample <1731> from the fill of posthole near roundhouse (10.2678);
- Sample <1740> from charcoal rich fill (10.2755) of pit [10.2756];
- Sample <1764>. from fill (10.2840) of gully [10.2703]; and
- Sample <1744> from daub rich occupation layer (10.2803).

3.2.25 Thirteen graves also yielded large quantities of charcoal. However, given the fact that this is a multi-period site, the ecofactual material recovered is not certain to date to the Early medieval periods.

3.2.26 Whilst the remaining thirteen samples contain ecofactual material, as they are either from areas of later construction or backfill they are not suitable for further analysis.

3.2.27 It should be noted that these are provisional recommendations for the CPR and charcoal and some of the deposits may become more important to analyse once further stratigraphic work has been undertaken.

Radiocarbon dating

No. of radiocarbon results achieved: 36

No. of failed samples: 1

No. of further radiocarbon determinations recommended: 30

3.2.28 A total of 28 radiocarbon dates were requested from the assessment phase. Twenty were submitted by Wardell Armstrong on behalf of Brython Archaeology with a further eight being submitted to SUERC relating to the human remains. These were submitted to date the human remains (SUERC) and to aid in phasing of the wider Wylfa Head site. Nine dates were requested by Headland during the trial trenching to which one failed; these radiocarbon dates were undertaken by SUERC and denoted by an Asterix to show trial trenching dates.

Table 9 Area 15 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553527	Elm charcoal	sample <1683> of fill (10.2610) from ditch [10.2672]	1820±30BP	cal AD90-320	Roman
Beta-553528	Hazel charcoal	sample <1730> palaeosol (10.2730) within TP [10.2725 SP3]	4180±30BP	2887-2666 cal BC	Late Neolithic
Beta-553529	Hazel charcoal	sample <1696> from floor surface deposit (10.2063)	1440±30BP	cal AD566-654,	Early medieval
Beta-553530	Hazel charcoal	sample <991> from fill (10.1424) of posthole [10.1425]	1930±30BP	cal AD4-130	Roman
Beta-553531	Willow/poplar charcoal	sample <1> of fill (10.0009) from small pit [10.0008]	4760±30BP	3639-3384 cal BC	Early Neolithic

Beta-553532	Oak charcoal	sample <1688> from fill (10.2599) of possible cremation [10.2598]	1770±30BP	cal AD138-345	Roman
Beta-553533	Oak charcoal	sample <1586> of fill (10.2294) from flue [10.2295]	1510±30BP	cal AD430-623	Early medieval
Beta-553534	Oak charcoal	sample <1757> from fill (10.2842) of stone structure [10.2811]	1990±30BP	cal 49BC-AD72	Late Iron Age to Roman
Beta-553535	Oak charcoal	<1773> of fill (10.2888) of pit [10.2887]	1680±30BP	cal AD258-422	Roman to early medieval
Beta-553536	Indeterminate charcoalified twig	<784> fill (10.1165) of posthole F.354	1700±30BP	cal AD254-406	Roman
Beta-553537	Indeterminate charcoalified twig	sample <215> silted fill (10.0372) of F.296	1620±30BP	cal AD382-538	Roman to early medieval
Beta-553538	Charred barley grain	sample <1401> of fill (10.2008) of linear [10.2007]	1820±30BP	cal AD90-130	Roman
Beta-553539	Charred barley grain	sample <1725> from fill (10.2706) of posthole [10.2707]	1700±30BP	cal AD254-406	Roman
Beta-553540	Charred barley grain	sample <1772> from fill (10.2773) of pit [10.2775]	1200±30BP	cal AD254-406	Roman
Beta-553541	Charred barley grain	sample <1708> from fill (10.2696) of pit [10.2695	1240±30BP	cal AD684-876	Early medieval
Beta-553542	Charred barley grain	sample <491> from fill (10.0797) of posthole [10.0798]	1570±30BP	cal AD416-556	Early medieval
Beta-553543	Charred wheat grain	sample <119> of fill (10.0234) from possible pit [10.0233]	1270±30BP	cal AD663-860	Early medieval
Beta-553544	Charred wheat grain	sample <703> from fill (10.1021) of ditch [10.1022]	1840±30BP	cal AD86-242	Roman
Beta-553545	Charred wheat grain	sample <69> of fill (10.0134) of F.206	1880±30BP	cal AD66-222	Roman
Beta-553546	Charred wheat grain	sample <231> of grey silty layer (10.0439)	1880±30BP	cal AD66-222	Roman
SUERC-94053 (GU55228)	Human bone	SK10.0620 within G115	1504±26BP	cal AD433-630	Early medieval
SUERC-94054 (GU55230)	Human bone	SK10.0747 within G80	1481±26BP	cal AD543-638	Early medieval
SUERC-94055 (GU55231)	Human bone	SK10.0749 within G80	1539±26BP	cal AD427-580	Early medieval
SUERC-94056 (GU55232)	Human bone	SK10.0931 within G56	1440±26BP	cal AD574-652	Early medieval
SUERC-94057 (GU55233)	Human bone	SK10.1607 within G233	1470±26BP	cal AD551-643	Early medieval
SUERC-94061 (GU55234)	Human bone	SK10.1741 from G347	1400±27BP	cal AD603-666	Early medieval
SUERC-94062 (GU55236)	Human bone	SK10.2182 within G368	1517±27BP	cal AD430-611	Early medieval
SUERC-94063 (GU55237)	Human bone	SK10.2920 from G233	1542±27BP	cal AD426-579	Early medieval
*SUERC-71160 (GU42757)	Charred wheat grain	sample <236> from fill (2156-005) of grave [2156-004]	1836±30BP	cal AD86-	Roman
*SUERC-71161 (GU427580)	Charred glume wheat grain	sample <248> of fill (2156-012) from grave [2156-011]	1735±29BP	cal AD240-385	Roman
*SUERC-71162 (GU42759)	Charcoal	sample <215> of fill (2157-009) of grave [2157-004]	1610±29BP	cal AD393-537	Roman to early medieval
*SUERC-71163 (GU42760)	Charcoal	sample <217> of fill (2157-009) from grave [2157-004]	1463±29BP	cal AD553-646	Early medieval
*SUERC-71167 (GU42761)	Charcoal	sample <220> of fill (2157-011) from grave [2157-006]	1493±29BP	calAD436-642	Early medieval
*SUERC-71168 (GU42762)	Charcoal	sample <222> of fill (2157-011) from grave [2157-006]	1478±27BP	cal AD544-640	Early medieval
*SUERC-71169 (GU42763)	Charcoal	sample <224> of fill (2157-011) from grave [2157-011]	1392±27BP	cal AD605-670	Early medieval
*SUERC-71170 (GU42764)	Charred pea	sample <45> of fill (2165-004) from grave [2165-005]	139±29BP	cal AD1669-1944	Post-medieval
FAILED	Bone	(2165-005)			

*Date achieved during the evaluation phase

Recommendations for additional radiocarbon dating

3.2.29 Further radiocarbon determinations are recommended on both the skeletal remains, charcoal and charred plant remains. Further dates on the cemetery would aid in clarification phasing and expansion of the cemetery through time. The osteologist recommended further dates on the following ten:

- n=2 from F296 G233 and possible G230/G243. SK10.1607 and SK10.2920 from G233 are both really fragmented, SK10.1236 from G230 presented only teeth and from G243 SK10.0784/SK10.2922 presented only long bone fragments, there is unlikely to be enough collagen for returning a date. The reason for this being submitted is that these are thought to be the earliest inhumations;
- n=1 from G115, SK10.0620 has a good selection of elements for selection for submission. This is being requested as it is from the graves to the west and south of F296.;
- n=1 from G347 SK10.1741 presented skull fragments only and may not be suitable for submission. This is from an earlier graves on a different orientation in south-west of the cemetery;
- n=2 from G80, SK10.0749 has long bong fragments that may be suitable, SK10.0747 has long bone fragments with no ends. This grave is an example of grave re-use;
- n=1 from G100, SK10.0745 has long bone fragments. This was selected as it was from a well organised square of graves in the south-east of F296 and possibly later formalisation of the cemetery;
- n=1 from G56 SK10.0931 has a good selection of bone for submission. This is from a group near the southern boundary wall;
- n=1 from G33 SK10.1772 is fragmented and may not be suitable for submission. This is from a deep grave cut through Roman remains;
- n=1 from G368 SK10.2182 consists of mandibular fragments and teeth;

3.2.30 The selection process should take into account the type of anatomical element and its preservation to optimise the chance of positive results. The sample target could include individuals spread over the wider cemetery area to gain a broader insight into the chronology of the cemetery. It may be pertinent to select further skeletal samples from graves located in the wider cemetery landscape, which could provide insights into the chronology of the cemetery. It is highly likely that some selected material will fail because of poor collagen quality; it is recommended that replacement bone samples are selected for analysis as a back-up or precaution should this occur.

3.2.31 Further dates are required on charcoal prior to commencement of charcoal analysis (note short-lived species would be preferred for submission and where the charred plant remains from the same sample have been recommended for analysis then that will have been recommended rather than a charcoal submission):

- <1612> from charcoal-rich fill (10.2383);
- <1618> from fill (10.2300) of flue [10.2301];
- <1637> from charcoal spread (10.2433);
- <1642> from (10.2453) within burnt area [10.2443];
- <1643> from (10.2454) within burnt area [10.2443];
- <1706> charcoal-rich fill (10.2688);
- <1731> fill (10.2678) of posthole near roundhouse;
- <1740> from charcoal-rich fill (10.2755) of pit [10.2756]; and
- <1744> daub rich occupation layer (10.2803).

3.2.32 Further dates should be obtained for the charred plant remains prior to the analysis:

- <1624> from black layer (10.2343);
- <1700> from black layer (102631);
- <1783> from black layer (10.2904);
- <1697> from floor (10.2082);
- <1703> from occupation layer (10.2581);
- <1764> from fill (10.2581) of gully terminus [10.2703];
- <1771> from organic fill (10.2871);
- <1772> from organic fill (10.2773);
- <1778> from deposit (10.2870);
- <1786> from (10.2911) of posthole [10.2910]; and
- <1792> from spread (10.2530).

Human Remains

3.2.33 The assemblage of human remains has been assessed by C. Butler and R. Madgwick. Their full report is included as Appendix 2 (Butler, C. and Madgwick, R., 2020). A summary is given here.

3.2.34 A total of 316 graves were recorded at Area 15; only 104 of the graves contained human remains. A further 21 small finds consisting of disarticulated human remains were also recorded, bringing the MNI (minimum number of individuals) for the site to 121 (Butler, C. and Madgwick, R., 2020). The preservation of each of the skeletons was poor, or very poor, with 84% of the assemblage being classified as less than 25% complete. Surface preservation of the bone - scored from 1 (excellent) to 5+ (poor to very poor) - revealed that none of the human remains scored below 3. This indicates highly damaged cortical bone surfaces, with a near absence of trabecular bone. Teeth and cranial fragments were the most common elements to have survived, along with elements of the femora. Os coxae were virtually absent.

3.2.35 The poor preservation of the human remains severely hindered the determination of biological sex and age estimation; 97 individuals were of indeterminate sex, seven others were juveniles (and so not possible to sex), five others were possibly male and three more possibly female. Two individuals were positively identified, one as definitely male and another as definitely female. Only 56 individuals could be assigned an age group. Metric analysis was only possible on two individuals. The recording of pathological conditions was again hampered by the poor preservation of the bone, but pathologies include linear enamel hypoplasia, caries, Cribra orbitalia, degenerative joint disease and enthesophytes. A limited number of non-metric traits was recorded and include squatting facets, a metopic suture AND Wormian bones.

3.2.36 Ten samples of human bone were sent for radiocarbon dating and included Skeleton nos. **10.1772**, **10.0934**, **10.0747**, **10.0749**, **10.0745**, **10.0620**, **10.1607**, **10.2920**, **10.1741** and **10.2182**. Two of the samples failed due to poor collagen quality (**10.1772** and **10.0745**) An early medieval date was confirmed by radiocarbon dating, ranging from 426 to 666 AD.

3.2.37 Despite the poor preservation of the human remains assemblage, the Wylfa Head cemetery site, or Area 15, is one of the largest early medieval cemeteries to be fully excavated in Wales and is of very high archaeological significance. Further analysis provides a rare and valuable opportunity to study the cemetery's occupants, their origins, burial practices and economies. Full osteological analysis is recommended. The employment of scientific methods is certainly recommended to answer questions on biological identity, dating and origins. The research themes identified in the post-excavation assessment report include full analysis of mortuary rites, focal features and

square mortuary enclosures in relation to the burial of family groups and social identities, the use of earlier monuments as focal points in the landscape and evidence of re-use with schist and slate slabs.

Recommendations

3.2.38 A series of recommendations for further work have been made by the osteologists who assessed the human remains (Butler, C. and Madgwick, R., 2020, pp. 36–39).

1. aDNA analysis on 30 individuals

3.2.39 A programme of aDNA analysis is highly recommended and can be utilised to explore relationships between individuals buried in different areas of the cemetery. Such aDNA analysis could also investigate origins, genetic affinity of the population, and reveal unusual pathologies. Burial in family plots is cited as a possible factor of Early Medieval burial in Wales and the presence of double burials at Wylfa Head may support this. This form of analysis can also determine the biological sex of an individual. At least 30 individuals with surviving fragments of petrous cranial portions should be made available for this type of analysis, to include a mixture of adults and non-adults, depending on the preservation of the bone and availability of these anatomical elements. It is recommended that 30 individuals are selected for aDNA analysis.

3.2.40 Isotope analysis for diet and migration will answer questions which were not answered based on macroscopic investigations of skeletal remains. Multi-isotope analysis of diet and provenance.

2. Strontium analysis on 100% of individuals with first molars present (roughly 30 individuals)

Strontium (87Sr/86Sr) should be undertaken on the enamel of M1, which provides a geological signal relating to childhood place of residence.

3. Oxygen (δ18O) isotope analysis on 50% of available individuals

Oxygen (δ18O) isotope analysis to provide a comparable climatic signal for place of origin should be performed on adjacent enamel from the same or an equivalent tooth.

4. $\delta_{13}C/\delta_{15}N$ analysis to be performed on all individuals

3.2.41 Carbon (δ13C) and nitrogen (δ15N) should be undertaken on bone collagen for dietary reconstruction on all individuals, targeting ready fragmented ribs to reduce the destructive impact on the material.

3.2.42 Both dietary and provenancing analysis may be augmented by sulphur (δ34S) isotope analysis of bone collagen. This provides an indication of coastal proximity and/or the consumption of marine foods in the years before death. Due to the limited detail provided by scanning of bones in assessment stage, individuals to be targeted for isotope analysis will be identified during detailed osteological reporting.

Research

3.2.43 The results contribute to an array of research issues, previously highlighted in the Research Framework and the Technical Update to the WSI for Trial Trenching and Excavation (Hounsell, D., 2016f, pp. 10–11). Area 20 should form a significant part of the monograph on the subject of the 2017/2018 Wylfa Newydd excavations (see Section 4.3 below). Each of the previously identified research objectives should be explored fully in that final publication, along with those highlighted in the assessment report and the osteological report (Butler, C. and Madgwick, R., 2020; Nelson-Viljoen, Macrow and Parry, 2020a, pp. 14–15).

Area 20

Periods

Mesolithic, Late Iron Age, Roman, Post Medieval

Site summary

3.2.44 This was a multi-period site, the core of which consisted of a roundhouse settlement of national importance dating to the Late Iron Age/Romano-British period. Neolithic and Early Bronze Age features consisted of a roundhouse with associated drip gullies, pits and post holes. One pit fill was radiocarbon dated to 3640-3370 calBC. These features had been covered by a deposit of hill wash. A later wall structure and two metalled surfaces were identified as later structures, with one metalled surface having a Roman weight present. Late Bronze Age and Iron Age features on site consisted of further settlement activity of two pit groups, a burnt mound and a settlement incorporating a ring gully, pits and post holes. Iron Age activity consisted of at least 11 stone-built roundhouses, three stone lined walls, four stone lined storage pits, four granaries and a cobbled surface. Roman period activity on Area 20 consisted of a further four roundhouses, two enclosures, a pit group and associated terraces, all located uphill away from the Iron Age activity in the valley. A field boundary of Post-medieval date was identified and corresponded with boundaries noted on 1st to 3rd

edition Ordnance Survey mapping. There was one group of intercutting pits of unknown date identified.

Stratigraphy

3.2.45 Harris matrices have been produced for the site and are included as Appendix 4 within the post-excavation assessment report (Young and Roberts, 2020, p. 20). Site represents activity across wide chronological and spatial context.

Artefacts

Table 10 Quantification of finds assemblages from Area 20

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Roman pottery	High	82	0.771	11 to 50	0.105	5	0.030	87	0.906	Yes	Yes	Sue Thompson (WA)	No	No
Fired Clay	High	328	2.583	11 to 50	10.000	11	0.505	339	13.088	Yes	No	Sue Thompson (WA)	No	No
Industrial Waste	High	19	0.393	>250	34.174	3	0.068	22	34.635	Yes	No	Sue Thompson (WA)	No	No
Lithics	High	22	0.254	1 to 10	0.001	5	0.080	27	0.335	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	High	53	31.008	1 to 10	0.456	60	83.928	113	115.392	Yes	Yes	Sue Thompson (WA)	No	No
Iron	Medium	7	0.772	1 to 10	0.135	7	0.440	14	1.347	Yes	Yes	Sue Thompson (WA)	Yes	Yes
Copper Alloy	High		0.000	0	0.000	9	0.194	9	0.194	Yes	Yes	Sue Thompson (WA)	Yes	Yes
Glass	Low	1	0.006	0	0.000	0	0.000	1	0.006	No	No	Sue Thompson (WA)	No	Yes
Post-medieval pottery	Low	32	0.448	1 to 10	0.108	0	0.000	32	0.556	No	No	Sue Thompson (WA)	No	No
CBM	Low	3	0.006	0	0.000	0	0.000	3	0.006	No	No	Sue Thompson (WA)	No	No
Leather	Low	0	0.000	1 to 10	0.005	0	0.000	0	0.005	No	No	Sue Thompson (WA)	No	No
Plaster	Low	0	0.000	1 to 10	7.931	0	0.000	-	7.931	No	No	Sue Thompson (WA)	No	No
Wood	Medium	0	0.000	0	0.000	7	0.304	7	0.304	Yes	Yes	Sue Thompson (WA)	No	No
Heated Stone	Low	0	0.000	150 to 249	5.715	0	0.000	-	5.715	Yes	Yes	Freddie Lowrie-Sisson (WA)	No	No
Magnetically responsive	Medium	N.A.	N.A.	N.A.	0.058	N.A.	N.A.	N.A.	0.058	No	No	Freddie Lowrie-Sisson (WA)	No	No

Roman Pottery

3.2.46 A total of 82 sherds of Roman pottery were recovered during the archaeological investigation at Area 20. Possible briquetage fragments were also recovered (330733) (30428) comprising coarse sandy oxidised fabrics. The very coarse fragments are potentially Cheshire briquetage, which would indicate salt production activity either on the site or in close proximity. Further analysis is warranted on the Roman pottery and ceramic assemblage, including illustration and also comparative research with other archaeological sites from Wylfa plus archaeological sites in the wider vicinity. Illustration is warranted on all diagnostic sherds, especially rims and bases plus any

refitting sherds/decorated pieces and any showing repairs. Pottery from (20192), (20364), (20422), (20473), (20636), (30149), (30064), (330678), (331110) and (331646) should be illustrated along with the briquetage from (30428), (320069), (330733) and (331854).

3.2.47 Of the five research framework areas identified in the North Wales archaeological framework review for Roman Wales, further analysis of this assemblage would contribute to at least two areas, including settlement patterns; the potential briquetage fragments would shed further light on local technologies and industries.

Fired Clay & Industrial Waste

3.2.48 A total of 326 fragments of fired clay fragments were recovered from 39 contexts; daub was also recovered as three small finds (SFs 32004, 32008 & 320034) and a large quantity of fired clay (10,000g+) was recovered from environmental samples. A small quantity of possible briquetage fragments were also recovered both as bulk finds and from environmental samples, potentially indicating salt production on the site or within close proximity. A small assemblage of industrial waste (n = 19) was also recovered. It is likely that the fired clay is furnace lining, indicating kiln activity while the presence of industrial waste on the site may indicate small-scale metal-working. Both groups of artefact should be analysed and discussed in conjunction with each other; a programme of XRF analysis may be warranted on the industrial waste to ascertain the composition of the slags and allow an understanding of any processes involved in local technologies and industries. A broad date of late prehistoric to Roman was given for the fired clay; to narrow the date range, it may be beneficial for any palaeoenvironmental material recovered in conjunction from contexts with fired clay to be sent for radiocarbon dating. Further analysis alongside the fired clay and industrial waste from HS 15 may be beneficial. Illustration of the industrial waste is not recommended; illustration is recommended for diagnostic fragments of fired clay only.

Stone

3.2.49 A total of 53 stone artefacts were recovered during the archaeological investigation at Area 20; 16 stone artefacts were recovered as small finds. Stone artefacts were also recovered from a small number of environmental samples. A wide range of artefact types are present and include whetstones / rubbing stones, quern-stones (including

rotary, beehive, trough and saddle), naturally-shaped pebbles, hammerstones, spindle whorls, loom weights, lamps, perforated slates as well as a possible perforated hammerstone or mace of Mesolithic to Neolithic date.

3.2.50 The stone assemblage is archaeologically significant on a very high scale; many different objects types are present, indicating a wide range of domestic and industrial activities occurring on the site and within close proximity e.g. textile production and domestic food preparation. Further analysis is certainly recommended and should include comparative research. It would be beneficial for this assemblage to be discussed in conjunction with stone assemblages from other Wylfa sites such as EV9; a mace head of similar date was recovered from this site. All of the tools and domestic functional objects should be illustrated; it is suggested that only a selection of the naturally-shaped pebbles should be illustrated.

3.2.51 Further analysis would benefit research areas such as settlement patterns as well as technology and industry. Some of these artefacts may be earlier in date, therefore analysis would also benefit these research areas for the later prehistoric periods.

Lithics

3.2.52 A total of 24 flints were recovered during the archaeological investigation at Area 20. The assemblage is made up of 66.6% debitage, 12.5% of cores and core fragments and 20.8% of retouched tools. With the exception of the cores, which appear to be Mesolithic in date, the remainder of this assemblage could date to the Mesolithic or Early Neolithic, although the bladelets are more likely to be Mesolithic. Also forming part of this assemblage are five scrapers, two side scrapers over flakes, two thumbnail scrapers over blades and a fragment of a circular scraper over a tertiary flake. The technological traits of the assemblage, particularly the characteristics of the retouched tools, strongly suggests a Late Mesolithic / Early Bronze Age.

3.2.53 Further analysis is certainly warranted, including comparative research and illustration of the tools and worked pieces. The recovery of prehistoric flints is of high archaeological significance; further analysis of these finds would contribute towards several archaeological research frameworks, including settlement sites and settlement patterns as well as artefact scatters. While further analysis may comprise a standalone section, the flints from Area 20 should be considered and discussed alongside flints from other Wylfa sites as part of a wider landscape survey.

Small Finds: metal & wood

3.2.54 Several metal small finds were recovered during the archaeological investigation at Area 20 and are worthy of illustration and further analysis. These finds include an iron knife blade S F200005, a copper alloy type III brooch or Nauheim derivative type SF 320039, a cast bronze anthropomorphic mount (probably Medusa) SF 200003, a horse bridle bit SF 20007, a fitting SF 320029 and a very corroded perforated coin, which is likely to comprise a double maiorina of the emperor Magnentius (Sear 2014, RCV Vol V. 18774) and dates to 350-353 AD. It was likely perforated long after its use as a coin (*Pers. Comm.* Giecco 2020). These objects span the Late Iron Age to Late Roman period; further analysis of these objects would enhance frameworks such as funerary and ritual research areas e.g. Medusa face mounts were thought to be apotropaic symbols of protection. They should be illustrated; a photograph of the coin may also be beneficial. The iron hob nails of Roman date recovered from environmental sample <20193> could be mentioned when discussing items of personal adornment and dress e.g. the brooch SF 320039.

3.2.55 A single worked wood small find, SF 320076, a shaped circular peg was also recovered which warrants further work and illustration; analysis should include species identification and comparative research with the other archaeological sites at Wylfa and also in the wider vicinity.

Other

3.2.56 No further work is recommended on the post-medieval pottery, leather, glass, plaster, clay tobacco pipe and bulk iron artefacts of late post-medieval to modern date.

Ecofacts

Total samples 611 (1442 tubs) 15301kg (9508 l)

3.2.57 Sixteen samples yielded over 100 examples of charred plant remains (CPR) each. Of these, two were almost certainly *in situ* burning, <320558> from fill (332701) of pit/hearth [332574] and sample <20154> from fill (30068) of hearth of roundhouse [20744], both returning radiocarbon dates placing them in the Iron Age into the Roman cultural period.

3.2.58 The features from which the following samples were recovered requires further clarification on phasing as they were cut through by post-medieval features. Sample

<20058> from fill (20471) of ditch [20740] and sample <320498> from burnt deposit (331430) were not submitted for radiocarbon dating but were typologically/associated with Iron Age features. Once clarification has been undertaken on phasing these should be analysed in conjunction with <320558> and <20154>. These assemblages would provide an insight into mid-late Iron Age crop husbandry at Wylfa and provide insight when compared to other practices across Wales at the time.

3.2.59 The other twelve samples were from later fills and waste activity and are unlikely to be relevant for analysing crop husbandry and therefore no further work is recommended on them.

3.2.60 Fifteen samples presented over 50g of charcoal of these five are recommended for analysis they are from *in situ* burning. These are: samples <320615> and <320616> both from burnt mound layer (30307), sample <320282> from burnt feature fill (330644), which should all be sent for radiocarbon submission to give secure dates for the features. Samples <320627> from fill (333328) and <320628> from fill (333329) both out of trough [333241] have returned an Iron Age date and should be submitted for full analysis.

3.2.61 A large well [332554] was noted as present on the site but only fill (30285) <320549> yielded any material which was less than 1g of charcoal and not deemed to be of any archaeological significance.

3.2.62 The shell recovered was highly fragmented and too small of an assemblage to be of archaeological significance, no further work is recommended.

3.2.63 The animal bone was extremely fragmented and not classed as archaeologically significant. No further analysis is recommended.

Radiocarbon dating

No. of radiocarbon results achieved: 18

Table 11 Area 20 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553502	Willow/poplar charcoal	sample <320550> of fill (332335) of pit [332121]	1940±30BP	cal 20BC-AD130	Late Iron Age to Roman
Beta-553503	Willow/poplar charcoal	sample <320649> of fill (333310) from pit [333511]	4720±30BP	3633-3376 cal BC	Early Neolithic

Beta-553504	Willow/poplar charcoal	sample <320628> of fill (333329) from trough [333241]	2830±30BP	1083-906 cal BC	Late Bronze Age
Beta-553505	Willow/poplar charcoal	sample <20065> from fill (20577) of hearth	1860±30BP	cal AD80-230	Roman
Beta-553506	Elm charcoal	sample <20164> of burnt deposit (30137) of pit [30136]	1880±30BP	cal AD66-222	Roman
Beta-553507	Oak charcoal	sample <320442> of fill (331267) of pit [331266]	2160±30BP	358-107 cal BC	Early to Middle Iron Age
Beta-553508	Charred oat grain	sample <320489> of the primary fill (331952) of hearth [331951]	1880±30BP	cal AD66-222	Roman
Beta-553509	Charred wheat grain	sample <20227> from primary fill (30362) of gully [30361]	90±30BP	cal AD1684-1928	Post-medieval to modern
Beta-553510	Charred wheat grain	sample <20154> of hearth fill (30068) from roundhouse [30231]	1840±30BP	cal AD86-242	Roman
Beta-553511	Charred barley grain	sample <320558> of hearth fill (332701) in pit [332574]	2230±30BP	384-204 cal BC	Early to Middle Iron Age
Beta-553512	Charred oat grain	sample <20189> of fill (30214) of [30215]	200±30BP	cal AD1646-post1950	Post-medieval to modern
Beta-553513	Willow/poplar charcoal	sample <320646> of burnt deposit (333544) in hearth [333298]	2290±30BP	405-231 cal BC,	Early to Middle Iron Age
Beta-554145	Charred wheat grain	sample <20010> from secondary fill (20291) of pit [20285]	1800±30BP	cal AD130-279	Roman
Beta-554147	Charred wheat grain	sample <320592> of layer (332432) of hearth [333031]	2180±30BP	361-168 cal BC	Early to Middle iron Age
Beta-554148	Charred barley grain	sample <320523> of secondary fill (331388) of roundhouse drain [331387]	2200±30BP	366-186 cal BC	Early to Middle Iron Age
Beta-554149	Charred oat grain	sample <20083> from fill (20812) of pit [20807]	1730±30BP	cal AD242-386	Roman
Beta-554150	Oak charcoal	sample <320471> from fill (331683) of pit [331684]	2080±30BP	190-3 cal BC	Middle to Late Iron Age
Beta-554151	Willow/poplar charcoal	sample <320464> of layer (331188)	1900±30BP	cal AD50-214	Roman
FAILED		<320560> from (332543)			
FAILED		<320677> from (333653)			

No. of further radiocarbon determinations recommended: 30

3.2.64 Twenty radiocarbon dates were requested from this site. This was undertaken to address chronological issues and to allow phasing to occur. Two failed to produce sufficient carbon and did not return dates.

3.2.65 To allow further analytical work on the charcoal and charred plant material assemblages a further 30 radiocarbon dates are requested. Of these, four should be the following: Charcoal fragments from sample <320282> from fill (330664) of a burnt feature and either one of <320615> or <320616> from layer (30307). These are thought to be from the same period as the material from the trough that was radiocarbon dated. Charred plant material from <20058> for fill (20471) of ditch would allow a date from which the large charred plant assemblage can be analysed and from <32498> from (331430) would aid in enhancing the date that has been typologically assigned with the Roman cultural period. Thus, dates are required from the following:

- Charcoal from <320615> of (30307) or <320616> of (30307);

- Charcoal from <320282> from burnt fill (330664);
- Charred plant remains from <20058> of ditch fill (20471); and
- Charred plant remains from <32498> of (331430).

Research

3.2.66 The site represents a significant concentration of multi-period activity, primarily characterised by Iron Age and Romano-British period settlement, with more limited evidence for Neolithic and Bronze Age activity. The results contribute to an array of research issues, previously highlighted in the Research Framework and the Technical Update to the WSI for Trial Trenching and Excavation (Hounsell, D., 2017e, pp. 9–10). These include the creation of more robust chronologies, through the use of radiocarbon dating, understanding changing patterns of settlement and land use, and interactions between newcomers and indigenes in the Roman period. Area 20 should form a significant part of the monograph on the subject of the 2017/2018 Wylfa Newydd excavations (see Section 4.3 below). Each of the 14 previously identified research objectives should be explored fully in that final publication.

3.2.67 The results are of local, regional and national importance. Locally, the results have changed the archaeological landscape from one of mainly prehistoric ritual and defensive activity, to one that includes more complex prehistoric and Roman period settlement. Regionally, the results complement the discovery of multi-period settlement at the Parc Cybi business park in Holyhead (Kenney, 2011; Kenney *et al.*, 2020), the Parc Bryn Cegin business park near Bangor (Kenney, 2008) and along the A55 road scheme in Anglesey (Cuttler, Davidson and Hughes, 2012). Equally, the results were significant for the lack of identified medieval archaeology, with no further opportunity to explore in detail the key research objectives such as the transition between the late Roman and early medieval and the continuity of settlement and land use into this period.

Area 4

Periods

Roman, Early Medieval, Post-medieval

Site summary

3.2.68 Area 4 contained the northern half of a Roman ditched enclosure, constructed upon the brow of a hill. Dense areas of pitting were recorded to the east and north of the enclosure as well as some interior features indicative of short-lived structures. The site may have been connected with the conquest of Anglesey in the later 1st c. AD, but an assemblage of 28 sherds of Roman pottery indicates a date range from the 1st to 3rd centuries AD. A sample of seeds from slumping within the enclosure ditch produced the earliest radiocarbon date with a range of AD 15-75. The infilling of one of the rubbish pits was dated to AD 65-220, another to AD 130-325.

3.2.69 This Roman enclosure has evidence of continued use into the Early medieval period. During the Early Medieval period a palisade trench was also added to the enclosure structure. A copper alloy penannular brooch of probable 6th–7th century date was retrieved from within a later ditch fill. A sample from the same deposit returned a radiocarbon date of AD 670-865.

Stratigraphy

3.2.70 Further stratigraphic analysis is warranted in view of the results of the radiocarbon dating programme, which indicate two distinct periods of use: one Romano and one Early medieval.

Artefacts

Table 12 Quantification of finds assemblages from Area 4

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt	Further specialist analysis	Illustration	Assessor name	Conservation	X-ray
Roman pottery	Medium	28	0.215		0.000		0	28	0.215	Yes	Yes	Sue Thompson (WA)	No	No
Fired Clay	Low	83	0.775	11 to 50	3.190		0	83	3.965	Yes	No	Sue Thompson (WA)	No	No
Industrial Waste	Low	4	0.232		0.000		0	4	0.232	Yes	No	Sue Thompson (WA)	No	No
Lithics	High	4	0.02387		0.000	2	0.013	2	0.037	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	High	10	0.437		0.000	5	3.609	15	4.046	Yes	Yes	Sue Thompson (WA)	No	No
Iron	Low	1	0.035		0.000	1	0.027	2	0.062	No	No	Sue Thompson (WA)	No	Yes
Copper Alloy	High		0		0.000	1	0.01	1	0.010	Yes	Yes	Sue Thompson (WA)	No	Yes
Glass	None	1	0.06		0.000		0	1	0.060	No	No	Sue Thompson (WA)	No	No
Animal Bone	Low	902	2.932	150 to 249	0.944		0	902	3.876	No	No	Sue Thompson (WA)	No	No
Clay Tobacco Pipe	Low	1	0.002		0.000		0	1	0.002	No	No	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	2	0.008		0.000		0	2	0.008	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	Low	N.A.	N.A.	N.A.	0.502	N.A.	N.A.	N.A.	0.502	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.2.71 A small assemblage of Roman pottery (n = 28) was recovered from Area 4. Although abraded, the Roman pottery warrants further analysis as part of the wider project, including illustration of diagnostic sherds as well as comparative research with other archaeological sites at Wylfa (such as HS 15 and Area 20) and in the wider vicinity.

3.2.72 A total of 83 fragments of fired clay plus a small assemblage of industrial waste (n = 8) were recovered from Area 4. Over 3,190g of fired clay fragments were recovered from 38 environmental samples. It is likely that the fired clay is furnace lining, indicating kiln activity.

3.2.73 The presence of industrial waste on the site could indicate that some form of metal-working occurred on the site or within close proximity; however, the very small quantity recovered from Area 4 could mean that any meaningful discussion or interpretation may not be valid. These fragments could also represent waste from fire deposits, therefore XRF analysis may not be pertinent here. Further analysis is recommended on these artefacts, but they should be discussed as part of a wider landscape survey of industrial activity with other Wylfa sites e.g. the fired clay and industrial waste assemblages from Area 20 and HS 15. If XRF analysis was to be undertaken, it should form part of a collective study with industrial waste assemblages from other Wylfa sites.

3.2.74 A broad date of late prehistoric to Roman was given for the fired clay; to narrow the date range, it may be beneficial for any palaeoenvironmental material recovered in conjunction from contexts with fired clay to be sent for radiocarbon dating. Further analysis alongside the fired clay and industrial waste from HS 15 may be beneficial. Illustration of the industrial waste is not recommended; illustration is recommended for diagnostic fragments of fired clay only e.g. fragments with thatch impressions or thumb prints.

3.2.75 A very small quantity of worked flints (n= 4) was recovered from Area 4. The assemblage comprises two tertiary flakes of black chert (SF4018 (4723)), and two beige fine-grained flints, a primary flake and side scraper over a flake (SF4015 (4399)). Although the assemblage is very small and likely to be residual, they should at least be mentioned as part of a wider landscape survey alongside flints from other Wylfa sites, including Areas 1, 5 and 17 as well as Hot Spots 5, 6 and 16. Illustration of at least two

of these flints is recommended. When considered with other Wylfa sites, further analysis of these may contribute to archaeological research areas in the Neolithic and possibly Bronze Age periods, including domestic settlement patterns and prehistoric human agency.

3.2.76 Very few small finds warrant further analysis but include a complete cast copper alloy penannular brooch of probably early medieval date (SF4031) and three stone small finds (SFs 4000, 4004 & 4021) comprising whetstones / grinding stones. Illustration and comparative research are recommended for these small finds. The stone small finds could be discussed in conjunction with stone assemblages from other Wylfa sites e.g. Area 20. The discussion of the brooch would contribute towards particular research areas within the national early medieval archaeological framework, including the *detailed analysis of early medieval artefacts and their contexts and characterisation of site assemblages.*

3.2.77 No further work is recommended on the glass, clay tobacco pipe, iron bulk finds, iron small finds, stone and post-medieval pottery.

Ecofacts

Total bulk samples 142 (400 tubs) 4387 kg (2549 l)

3.2.78 More than 300 charred plant remains (CPR) and 33g of charcoal from the assemblage from sample <4054> taken from fill (4604) of pit [4603]. This was radiocarbon dated and returned an early medieval date and should be fully analysed for both crop and fuel practices in the Welsh landscape.

3.2.79 Over 500 charred plant remains from sample <4036> of fill (4291) of fire pit [4290] were recovered and should be used to provide a radiocarbon date. A total of 62 CPR were observed in sample <4132> from fill (41134) of an enclosure ditch [41102] should also be submitted for dating to establish if this was deposited in the same period as the other *in situ* burning events were taking place.

3.2.80 The CPR from <4174> from fill (41229) of construction cut [41255] and <4175> from fill (41230) from the same cut, despite being in large quantities, was disturbed by the later construction of a wall or enclosure and is likely not related to the feature and therefore no further analysis is recommended on these two assemblages despite the quantity of material.

3.2.81 Charcoal from sample <4052> from fill (4579) of pit [4578] amounted to 10g which was submitted for dating and returned a Roman date, along with 14g of charcoal from sample <4070> from fill (4718) of furnace [4710], should both be fully analysed due to likely *in situ* burning. Charcoal from sample <4070> should be submitted for radiocarbon dating to assess the age of the furnace (it was noted that 247g of ceramic building material was recovered from the sample thus would also provide a date for that material).

3.2.82 Ecofacts from <4054>, <4036>, <4132>, <4052> and <4070> should all be fully analysed once absolute or typologically dated.

3.2.83 A total weight of 2932g of animal bone was recovered from the excavations at Area 4 likely to be present as debitage from food waste. The bone was in a poor state of preservation and beyond the identifications undertaken during the assessment phase, which can be used to further inform wider dietary practices, no further work is recommended.

Monoliths

3.2.84 Two features were sampled in section to assess for site formation processes. These were then sent to geoarchaeologist Mike Allen for assessment (Laverty and Horsley, 2020: Appendix 6). A summary of the results is included below. Sub-samples were taken for analysis of pollen and diatoms, but not sent off. This task should be undertaken during the analysis phase.

Earlier Romano British Boundary Ditch 41275

3.2.85 Three monoliths were taken from section 41168 which were samples <4128>, <4129> and <4139>.

3.2.86 Pollen sub-samples were taken at 40mm intervals and diatom sub-samples at 80mm intervals were restricted to the minerogenic primary deposits. A total of 40 sub-samples were removed 35 for pollen and 5 for diatoms.

3.2.87 Of these, pollen samples from depths (cm) 8, 28, 44, 64, 84, 104 ,124 and 140, as well as diatom samples from depths (cm) 68,72,124 and 140 are recommended for initial assessment.

Romano British Military Enclosure 41271

3.2.88 Monolith samples were taken from three locations: two from the eastern facing entrance and one from the northern limb. Four monoliths were taken from section 41102 which were samples <4126>, <4127>, <4124> and <4125>. Three monoliths were taken from section 4905: samples <4130>, <4131> and <4140>. Six samples were taken from section 4513 which were samples <4137>, <4138>, <4141>, <4142>, <4143> and <4144>.

3.2.89 Pollen sub-samples were removed from 40mm intervals and diatoms at 80mm intervals from the minerogenic primary deposits. A total of 112 sub-samples were removed 98 for pollen and 14 for diatoms.

3.2.90 Initial assessment recommendations are from section 4905 pollen depths (cm) 12, 28, 44, 60, 76, 92, 108, 124 and 140 and diatoms at depths (cm) 68, 72, 124 and 140. Or they can be taken from section 41102 pollen depths (cm) 16, 36, 56, 80, 100, 120, 156, 180 and 208 and diatom depths (cm) 116, 132, 180 and 212.

Radiocarbon dating

No. of radiocarbon results achieved: 7

Table 13 Area 4 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553514	Charred oat grain	sample <4059> of fill (4601) of pit [4060]	1880±30BP	cal AD66-222	Roman
Beta-553515	Charred oat grain	sample <4601> of fill (4726) of palisade terminus [4724]	1370±30BP	cal AD608-688	Early medieval
Beta-553516	Charred wheat grain	sample <4104> from secondary fill (4711) of trackway [4916]	1550±30BP	cal AD422-574	Early medieval
Beta-553518	Charred wheat grain	sample <4132> from tertiary fill (41134) of enclosure ditch [41102]	1260±30BP	cal AD661-864	Early medieval
Beta-553519	Charred oat grain	sample <4054> from fill (4604) of pit [4603]	1230±30BP	cal AD668-882	Early medieval
Beta-553520	Charred barley grain	sample <4049> of fill (4532) of palisade [4522]	1280±30BP	cal AD661-774	Early medieval
Beta-553521	Oak charcoal	sample <4052> of fill (4579)of burnt pit [4578]	1800±30BP	cal AD130-326	Roman
FAILED		<4024> from (4258)			

No. of further radiocarbon determinations recommended: 4

3.2.91 It is recommended that a further four radiocarbon results are sought. To be able to facilitate the analysing of palaeoenvironmental material it would be required to seek dates from material from sample <4070> from fill (4718), of furnace [4710], from

sample <4036>, of fill (4291) from pit [4290] and from sample <4132> of fill (41161) of enclosure ditch [41139]. Also, to attempt to refine a date for flint SF4015 from (4399) there may be enough charcoal from sample <40304> of fill (4400) of pit [4398] to be able to provide a Terminus Ante Quem (TAQ) for the flint. The flint tool originates from the lower fill (4399) of this pit.

3.2.92 One charcoal sample and six charred cereal grains were submitted to Beta Analytic for radiocarbon determination.

Sample No.	Context	Material	Date (probability %)	Period
4052	4579	Oak (Quercus sp.) charcoal	130-326 cal AD (95.4%)	Roman
4104	4711	Wheat (Triticum sp.) grains	422-574 cal AD (95.4%)	Early Medieval
4132	41134	Wheat (Triticum sp.) grains	668-864 cal AD (95.4%)	Early Medieval
4049	4532	Barley (Hordeum sp.) grain	661-774 cal AD (95.4%)	Early Medieval
4054	4604	Oat (Avena sp.) grains	668-882 cal AD (95.4%)	Early Medieval
4059	4601	Oat (Avena sp.) grains	66-222 cal AD (95.4%)	Iron Age to Roman
4061	4726	Oat (Avena sp.) grains	608-688 cal AD (95.4%)	Early Medieval

Research

3.2.93 Ecofactual material offers the potential to provide further insight into crop and fuel management across Anglesey and North Wales when put into wider context. An assessment of the pollen and diatoms could not be undertaken during the geoarchaeological assessment due to the lockdown of laboratories during the coronavirus pandemic of 2020 (Ibid., 10). This should be undertaken as a priority during any subsequent phase of assessment or analysis.

Hotspot 15

Periods

Late Bronze Age, Iron Age, Roman, Medieval, Post-medieval

Site summary

3.2.94 Hotspot 15 contained evidence of an occupation site with continuity from the very Late Bronze Age into the Roman period. The earliest features were a group of four pits and a shallow ditch which returned a radiocarbon date of 805-746 BC Late Bronze Age to Iron Age. Other features at Hotspot 15 relating to this period were less coherent in pattern, a group of post holes identify a multi-phase of timber buildings, one post hole fill having been radiocarbon dated to 113-264 AD. The final feature assigned to this period is the convergence of two trackways made of stone and pebbles in a shallow depression in the natural. A deposit sealing the trackway was radiocarbon dated and returned a date of 1445-1524 AD.

3.2.95 These first phase features may be more closely associated than the radiocarbon dates suggest, or they could represent intermittent use of the area over an extended period. A stone building phase of settlement occurred next at Hotspot 15 including two stone-built roundhouses, one having a raised floor and the other having a schist slab threshold in a clay matrix which was radiocarbon dated to 2BC – 125AD. A further stone building with a radiocarbon dating of AD 4-130, Late Iron Age to Mid Roman. A second stone structure with a raised floor having a radiocarbon date of 66-222 AD Roman. A third circular stone structure oven or kiln having evidence of charcoal fills, four enclosure walls across the site were also identified, several pits and a stone and schist lined well were all identified at Hotspot 15, all having evidence of burning. The final phase of archaeological features at Hotspot 15 were above rubble and associated abandonment layers and consisted of a stone surface around the well, created with schist and a capstone for the well. Two walls and a pit went beyond the limit of excavation and their extent and therefore their use is undetermined. A group of post holes and stake holes located above the raised floor possibly relate to temporary structures.

Stratigraphy

3.2.96 The enclosed settlement identified at Hotspot 15 demonstrates a prolonged period of activity which was observed in the multiple phases of activity. The settlement appears to have been in use during the Romano-British period, as demonstrated by the pottery and other artefacts, but no artefacts were recovered from features which pre and post-dated this activity. It is possible therefore that the site may have been in use from

the Iron Age to the early medieval period. The features identified in Hotspot 15 bear similarities to those encountered on a larger scale at Area O5 South, located approximately 230m to the south-west, and may be contemporary.

Artefacts

3.2.97 Brython Archaeology used a collection strategy in which almost all categories of find were located and treated as Small Finds. In Table 8, therefore, the distinction between bulk finds and small finds used by other contractors does not apply.

Table 14 Quantification of finds assemblages from Hotspot 15

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt	Analysis	Illust.	Assessor name	Conservation	X-ray
Prehistoric Pottery	High	0	0.000	0	0.000	12	0.094	12	0.094	Yes	Yes	Frances Lynch	No	No
Roman pottery	High	0	0.000	0	0.000	90	0.772	90	0.772	Yes	Yes	Sue Thompson (WA)	No	No
Fired Clay	High	0	0.000	0	0.000	143	21.128	143	21.128	Yes	No	Sue Thompson (WA)	No	No
Industrial Waste	High	0	0.000	51 to 149	1.509	28	1.021	28	2.530	Yes	No	Sue Thompson (WA)	No	No
Lithics	High	0	0.000	0	0.000	12	0.178	12	0.178	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	High	0	0.000	1 to 10	0.607	88	34.000	89	34.607	Yes	Yes	Sue Thompson (WA)	No	No
Worked bone	Medium	0	0	0	0	13	0.084	13	?	Yes	Yes	Megan Stoakley	No	No
Iron	Medium	0	0.000	51 to 149	0.015	10	0.635	61	0.682	Yes	Yes	Sue Thompson (WA)	Yes	Yes
Copper Alloy	Medium	0	0.000	0	0.000	7	0.075	7	0.075	Yes	Yes	Sue Thompson (WA)	No	No
Lead	Medium	0	0.000	0	0.000	1	0.036	1	0.036	Yes	Yes	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	0	0.000	1 to 10	0.002	4	0.025	4	0.027	No	No	Sue Thompson (WA)	No	No
Ceramic Building Material	Low	0	0.000	51 to 149	7.354	0	0.000	0	7.354	No	No	Sue Thompson (WA)	No	No
Pottery (Unknown date)	Low	0	0.000	1 to 10	0.018	0	0.000	0	0.018	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	Low	N.A.	N.A.	N.A.	0.000	N.A.	N.A.	0	0.000	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.2.98 A small assemblage of prehistoric pottery was recovered during the archaeological investigation at HS 15 (n = 12; SFs 001, 006 & 122). Further analysis is warranted on the prehistoric pottery sherds, including refined fabric analysis and comparative research. The artefacts may warrant illustration or photography, although no diagnostic sherds are present. A broad date of Bronze Age to Iron Age has been attributed to these sherds; radiocarbon dating of palaeoenvironmental material recovered in conjunction with the prehistoric pottery may help tighten the date range. The prehistoric pottery should be analysed and discussed alongside prehistoric pottery assemblages from the other Wylfa sites as part of a wider landscape survey, including sites HS 7-9, HS 11-13, EV9 and Area 15.

3.2.99 An assemblage of 70 sherds of Roman pottery was recovered during the excavation at HS 15. Coarse and finewares are represented; a single pot repair was observed in one vessel, indicating its re-use. Further analysis is recommended, including further comparative research, refined fabric analysis and illustration of diagnostic sherds. Reconstruction of any refitting pieces would aid illustration. Further analysis should include Roman pottery assemblages from other Wylfa sites, such as Area 20. Further analysis would benefit research areas such as Roman settlement patterns.

3.2.100 A total of 11 flints were recovered from HS 15. The assemblage is formed by debitage (58.3%), cores (33.3%) and burnt flint (8.3%). The chert cores are described as two single platform flake cores (SF011, SF053) and two single platform blade cores (SF052, SF007). The debitage is represented by flake-based removals of varied morphology, the majority hard hammer struck from simple unprepared striking platforms, matching the cores found on site. The assemblage is residual and chronologically could be assigned to a Late Neolithic / Early Bronze Age. Further analysis is recommended on the flints, including comparative research, illustration and their discussion alongside flint assemblages from other Wylfa sites. Further analysis will benefit research areas such as settlement sites and settlement patterns as well as artefact scatters.

3.2.101 A total of 89 stone artefacts were recovered from Hot Spot 15 and Hot Spot 15 West, weighing 34,607g+ and comprising 45 small finds. The assemblage is in good condition and includes quern fragments, weights, spindle whorls, loom weights and whetstones. A broad date of later prehistoric to Roman was attributed to this assemblage. A similar assemblage was recovered at Area 20 and EV9; this assemblage is of high archaeological significance and further analysis is recommended, to include comparative research; all of the tools and domestic functional objects should be illustrated. While this may comprise a standalone section, the stone assemblages should be discussed alongside stone assemblages from the other Wylfa sites as part of a wider landscape and domestic settlement survey. As the finds such as the spindle whorls and loom weights provide evidence of fabric / textile production either on the site or within close proximity, it may be pertinent to discuss these finds alongside the bone weaving comb fragments and tools recovered from this site. Further analysis will benefit research areas such as settlement sites and patterns. Small Finds 10 and 39 are natural in provenance and no further work is recommended.

3.2.102 A total of 143 fragments of fired clay was recovered during the archaeological excavation at Hot Spot 15, with a combined weight of 21,128g. A total of 21 small find numbers were allocated. Also recovered from Hot Spot 15 was a small assemblage of industrial waste (n = 28). The bulk of material was recovered from contexts (115.0202) and (115.0203), in particular SF118 (115.0203), which was collected as a sample of kiln structure. Three fragments, (SF60, SF77 and SF105), show signs of extreme heat with vitrified surfaces and were also likely part of a kiln / furnace structure.

3.2.103 Substantial quantities of both types of artefact were also recovered from environmental samples. The fired clay is likely to be associated with a kiln structure or as lining; the presence of industrial waste on the site may indicate small-scale metal-working. Both groups of artefact, including the material from the environmental samples, should be analysed and discussed in conjunction with each other; a programme of XRF analysis may be warranted on the industrial waste to ascertain the composition of the slags and allow an understanding of any processes involved in local technologies and industries. It will perhaps be beneficial to undertake this analysis alongside the fired clay and industrial waste assemblages recovered from Area 20 as part of a wider landscape survey. Illustration of the industrial waste is not recommended; illustration is recommended for diagnostic fragments of fired clay only.

3.2.104 A minimum of thirteen small finds (SFs 85, 91, 93, 95, 98, 99, 102, 110, 125, 130, 137, 144 & 169) have been identified as worked objects and include fragments of probable tools and also weaving combs. The worked fragments originate from ribs and limb bones from medium to large-sized ungulate species (caprovids and bovids). These small finds are likely to be of Iron Age to Roman date. These artefacts are of high archaeological significance and further analysis is recommended, to include comparative research and illustration. As these finds provide further evidence of fabric / textile production either on the site or within close proximity, it may be pertinent to discuss these finds alongside any spindle whorls and loom weights recovered from this site. Further analysis of these finds would contribute to research areas such as settlement patterns as well as technologies and industries.

Ecofacts

3.2.105 Total samples 139 (368 tubs) 4011 kg (2527 l)

3.2.106 Prior to full analysis of the charred plant remains being conducted, they must be radiocarbon dated. Bearing this caveat in mind, the following six assemblages can be reommended:

- From sample <41> from burned layer (115.0237) within roundhouse n=60 Charred plant remains (CPR)
- From sample <49> from burned layer (115.0203) n=>400 CPR
- From sample <78> from charcoal layer (115.0335) n=>200 CPR
- From sample <215.010> from fill (215.0033) of pit [215.0034] n=25 CPR
- From sample <99> from fill (115.0390) of pit [115.0207] n=23 CPR
- From sample <33> from fill (115.0176) of pit [115.0198] n=27 CPR

Charcoal was present in across the entire site but often yielding under 1g even from the areas of burning and as a result is not recommended for further work.

Further analysis only recommended on the above CPR. Once dates have been obtained the analysis would give an insight in palaeodiet and past husbandry practices.

Radiocarbon dating

No. of radiocarbon results achieved:11

Table 15 Hotspot 15 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554155	Oak charcoal	sample <58> from fill (115.0303) of pit/posthole [115.0278]	1880±30BP	cal AD66-222	Roman
Beta-554156	Oak charcoal	sample <48> of fill (115.0214) from linear [115.0215]	2560±30BP	805-666 cal BC	Early Iron Age
Beta-554157	Indeterminate charcoalified twig	sample <215.003> from primary fill (215.0017) of pit [215.018]	2330±30BP	485-2625 cal BC	Early to Middle Iron Age
Beta-554159	Charred barley grain	sample <215.0010> of lower fill (215.0033) of pit [215.0034] presented	2150±30BP	356-61 cal BC	Iron Age
Beta-554160	Indeterminate charcoalified twig	sample <18> from (115.0008) trackway	380±30BP	cal AD1445-1632	Medieval
Beta-554161	Charred barley grain	sample <27> from fill (115.0457) of posthole [115.04585]	1790±30BP	cal AD133-330	Roman
Beta-554162	Charred barley grain	sample <81> from fill (115.0366) of drain [115.0368]	1950±30BP	cal 21BC-AD125	Late Iron Age to Roman
Beta-554163	Charred barley grain	sample <78> from charcoal layer in sunken structure (115.0335)	1880±30BP	cal AD66-222	Roman
Beta-554164	Charred barley grain	sample <14> of charcoal fill (115.0020)	1980±30BP	cal 45BC-AD77	Early Iron Age
Beta-554165	Oak charcoal	sample <42> of burnt layer (115.0236) in oven [115.0235]	570±30BP	cal AD1304-1422	Medieval
Beta-554166	Charred oat grain	sample <215.007> from (215.0005)	1930±30BP	cal AD4-130	Late Iron Age to Roman
FAILED		<35> which was from rubble layer (115.0095) of structure [115.0087]			

No. of further radiocarbon determinations recommended: 6

Twelve radiocarbon samples were submitted; however, one failed due to not enough carbon being present. All were taken to aid in defining chronology of the site.

Deposits where prehistoric pottery, lithics and undated objects were recovered were examined further to see if there was material that would be suitable for dating to be able to refine the typological dates. The contexts that yielded these objects were either not sampled or lacked the material for submission. To that end only those required for further palaeoenvironmental analysis were recommended.

Further dates would be required to support further analysis on the charred plant remains, these are:

- From sample <41> from burned layer (115.0237) within roundhouse n=60 Charred plant remains (CPR)
- From sample <49> from burned layer (115.0203) n=>400 CPR
- From sample <78> from charcoal layer (115.0335) n=>200 CPR
- From sample <215.010> from fill (215.0033) of pit [215.0034] n=25 CPR
- From sample <99> from fill (115.0390) of pit [115.0207] n=23 CPR
- From sample <33> from fill (115.0176) of pit [115.0198] n=27 CPR

Research

3.2.107 To fulfil the potential of the site data, the updated objectives and research questions have been set out below to provide a framework for the proposed further analysis. Addressing the aims and objectives will be achieved through an examination of the stratigraphy and contextual analysis of the datable finds. The excavation also produced samples of environmental material, some of which retrieved from stratified context. Identification of plant species, in particular wood species, in addition to data on ring curvature, counts and possible diseases may further aid our understanding of wood selection and woodland management, crop husbandry and land use.

Prehistoric

Q.1. Are the possible structural features associated with isolated structures or part of a larger settlement?

Q.3. What is the functional and stratigraphic relationship between the burnt mounds/spreads and other spatially associated features in particular reference to possible structural features (post holes) and ditch type features ('troughs')?

Q.4. What relationships or patterns, if any, can been seen between these prehistoric features and their wider landscape setting?

Q.5. What evidence do the ditch features provide for prehistoric landscape organisation and enclosure?

Q.6. What is the relationship between the ditches and other prehistoric features such as settlement features and burnt mounds/spreads?

Q.7. What relationships or patterns, if any, can been seen between these potential prehistoric features and their wider landscape setting?

Q.8. What types of artefacts are present in the SMS zones?

Q.9. What can these artefacts tell us about daily life and ritual activity?

Q.10. Were those artefacts, which may be found in the SMS Zones, produced locally?

Romano British

Q.14. How did the culture on the island change, and in what ways, between the Roman and Early Medieval periods?

Q.15. What types of Roman Sites are present with the Wylfa Newydd Development Area, and how do they relate to their surrounding landscape both in terms of location and utilisation of the landscape?

Medieval to Post-Medieval

Q.11. What can the ditches and land drains tell us about the process of enclosure and land improvement in the Post-Medieval to the modern periods in the SMS zones?

Q.12. What evidence is there for the types of farming and land use in this area in the post-Medieval and modern periods in the SMS zones?

Q.13. What can artefacts indicative of the material culture of the Medieval, Post-Medieval and modern periods, in these zones, tell us about the connections between this area and the wider world through trade and consumption?

3.3 The ten Class 2 sites (of high archaeological significance)

Area 2

Periods

Neolithic, Roman, Early Medieval

Site summary

3.3.1 The archaeological excavation revealed a possible henge/barrow monument with the remains of a stone revetment to the inside edge of the penannular ditch, near to the entrance. The stonework suggests decorative rather than practical purposes. Infilling of a re-cut to the ditch's western side was radiocarbon dated to between the 3rd and mid-6th century AD. Associated, sporadic and low-level settlement evidence was also recorded to the west and south-east, with the construction of partial enclosures surrounding roundhouses and occupational metalled surfaces. These are not well dated, but are thought possibly to have been of Late Iron Age/Roman date, due to a small assemblage of artefacts. The settlement evidence extended beyond the limits of

the excavation trenches. To the south east, an undated field system is thought to have been broadly contemporary with the settlement.

3.3.2 Probable furnaces/ovens to the south of the henge/barrow within the former settlement area were radiocarbon dated to the 12th century AD, suggesting localised industrial activity. Post-medieval installation of field boundaries and clawddau were observed separating Fields L11, L12 and L16. The foundations of Park Lodge were also recorded in Fields L9 and L13, with origins probably dating to the late 18th/early 19th century.

Stratigraphy

3.3.3 Further stratigraphic analysis is required. The chronology of the site remains uncertain. Additional radiocarbon dates alongside a detailed examination of the context which yielded finds is recommended (see below). Regional parallels to the large penannular ditch [2308] need to be sought, and the nature of the relationship between this feature and the other archaeological features on the site needs clarifying.

Artefacts

Table 16 Quantification of finds assemblages from Area 2

Category	Significance	Bulk cnt	Bulk wgt	Enviro abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Prehistoric Pottery	High	19	0.048		0.000		0.000	19	0.048	Yes	Yes	Frances Lynch	No	No
Roman pottery	High	4	0.050		0.000		0.000	4	0.050	Yes	Yes	Sue Thompson (WA)	No	No
Fired Clay	Low	8	0.035	1 to 10	0.014		0.000	8	0.049	No	No	Sue Thompson (WA)	No	No
Industrial Waste	Low	47	1.786	11 to 50	0.597		0.000	47	2.383	No	No	Sue Thompson (WA)	No	No
Lithics	High	41	1.509		0.000		0.000	41	1.509	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	High	20	19.494		0.000		0.000	20	19.494	Yes	Yes	Sue Thompson (WA)	No	No
Iron	Low	10	0.734		0.000	1	0.006	11	0.740	No	Yes	Sue Thompson (WA)	No	No
Copper Alloy	High	1	0.010		0.000	1	0.015	2	0.025	Yes	Yes	Sue Thompson (WA)	No	No
Lead	High	1	0.017		0.000		0.000	1	0.017	Yes	Yes	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	7	0.124		0.000		0.000	7	0.124	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None	N.A.	N.A.	N.A.	0.343	N.A.	N.A.	-	0.343	No	No	Freddie Lowrie-Sisson (WA)	No	No

Nineteen fragments of prehistoric pottery were recovered during the excavation at Area 2. This is of high archaeological significance and further analysis is recommended, including the illustration of diagnostic sherds and comparative research. Analysis should include the comparison of this assemblage with prehistoric pottery assemblages from other Wylfa sites, including Wylfa Head, EV9 and HS 7-9.

A total of 41 flints were recovered during the archaeological investigation. The assemblage is made up of 61% debitage, 31.7% of cores and core fragments and 4.9% of retouched tools; the remaining 2.4% is undiagnostic. The technological traits of the assemblage, particularly the characteristics of the flake and blade-like removals, strongly suggest a Late Neolithic/Early Bronze Age date. Further analysis, including the illustration of a minimum of 25 flints as well as comparative research, is recommended. While the flint assemblage from Area 2 should comprise a standalone text, the assemblage should be discussed with flint assemblages from other Wylfa sites, to provide a more holistic interpretative discussion about the use of the wider landscape and settlement patterns.

Twenty stone artefacts were recovered during the archaeological investigation, including querns, weights and spindle whorls. Further analysis on these artefacts, including comparative research and illustration, is recommended.

No further analysis is recommended on the Roman pottery, post-medieval pottery, fired clay, industrial waste, bulk iron artefacts, bulk copper alloy artefacts and SF2802 (Fe).

Ecofacts

Total samples 49 (145 tubs) 1594 kg (859 l)

Charred plant remains (CPR) were present in twenty-two samples of which nine yielded more than 10 examples of charred plant remains. Seven of these are suitable for further work which were:

- Sample <2506> from fill (2694) out of pit [2693];
- Sample <2510> from fill (2730) out of pit [2729];
- Sample <2802> from fill (2864) out of gully [2863];
- Sample <2806> from fill (2898) out of ditch [2897];
- Sample <2807> from deposit (2916) on top of metalled surface [2931];
- Sample <2809> from fill (2896) out of pit [2895]; and
- Sample <2834> from fill (2834) out of ditch [2833].

3.3.4 These samples are all assumed single fills and should all be dated to assess the dates of the features and therefore put the material in a period context prior to analysis. This is particularly important for this site as the site was initially assessed as a Henge along with a late iron age/ roman Britain settlement and field systems. However, the previous samples submitted for radiocarbon dating returned early medieval dates. Once dated further work can be carried out as they will help inform in crop husbandry practices for that period in the wider Wylfa and Welsh landscape.

3.3.5 Two samples yielding over 10 examples have been classed as unsuitable for analysis due to likely being disturbed post deposition or voided which are:

- Sample <2505> and fill (2668) out of ditch re-cut [2616]; and

- Sample <2818> from deposit (2976) a void context (although if further stratigraphical work is done this assemblage may be analysed if the context is reassigned any significance).

3.3.6 The other twelve samples yielding less then 10 CPR have been discounted as the assemblages are too small to be of archaeological significance.

3.3.7 Charcoal was present in twenty-six samples of which four yielded over 5g of charcoal three of these are suitable for analysis which are:

- Sample <2506> from fill (2694) out of pit [2693];
- Sample <2508> from fill (2697) out of pit [2695]; and
- Sample <2509> from fill (2607) out of ditch [2606].

3.3.8 These are assumed single fills and due to the discrepancy between the believed period of occupation and the recovered radiocarbon dates should be dated through radiocarbon submission (sample <2506> can be either charcoal or CPR depending on preservation and present species). Once dates have been received then the charcoal will assist in the understanding of fuel procurement practices in the wider Wylfa and Welsh landscape.

3.3.9 Further scientific dating is also necessary to pin down the date of the archaeological features recorded. This will have a significant impact on the interpretation of the CPR and charcoal recovered.

3.3.10 The animal bone is described as highly fragmented food waste and has not been deemed suitable for further analysis.

Radiocarbon dating

No. of radiocarbon results achieved: 3

No. of radiocarbon submissions failed: 2

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553522	Charred barley grain	sample <2508> from lower fill (2679) of furnace [2678]	960±30BP	cal AD1020-1155	Medieval
Beta-553523	Charred wheat grain	sample <2830> of fill (2269) of ditch terminus [2268]	1560±30BP	cal AD420-565	Early medieval
Beta-554152	Charred barley grain	sample <2834> from secondary fill (2292)of stone structure [2289]	1180±30BP	cal AD730-952	Early medieval
FAILED		Sample <2658> from fill (2658) from ring ditch [2657]			
FAILED		Sample <2701> from fill (2508) from ditch [2507]			

No. of further radiocarbon determinations recommended: 9

3.3.11 A total of five radiocarbon determinations were requested as part of the assessment to be able to aid in phasing the site, two of these failed due to insufficient carbon.

3.3.12 Sample <2658> from fill (2658) from ring-ditch [2657] and sample <2701> from fill (2508) from ditch [2507] failed.

3.3.13 The dearth of sample taking during the excavation prohibited a wider selection that would allow issues of applying absolute dating to material that allowed for typological dating i.e. prehistoric pottery. To be able to support the analysis of the charred plant remains and charcoal it is recommended further radiocarbon determinations are sought from:

3.3.14 Charred plant remains:

- Sample <2506> from fill (2694) of pit [2693];
- Sample <2510> from fill (2730) of pit [2729];
- Sample <2802> from fill (2864) of gully [2863];
- Sample <2806> from fill (2898) out of ditch [2863];
- Sample <2807> from deposit (2916) on top of metalled surface [2931;
- Sample <2806> from fill (2896) of pit [2895]; and
- Sample <2834> from fill (2834) from ditch [2833].

3.3.15 Charcoal (selection of short-lived species will be made where possible):

- Sample <2508> from fill (2697) out of pit [2695]; and
- Sample <2509> from fill (2607) from ditch [2606].

Research

3.3.16 Landscape overview. Ecofacts can be used in conjunction with the wider Wylfa excavations to show a more defined picture of wood, crop and land management across Anglesey and into the wider landscape. Examination of plant procurement, crop husbandry practices and paleo-diets.

Area 7

Periods

Neolithic, Iron Age, Early Medieval, Post Medieval

Site summary

3.3.17 The archaeological excavations at this hilltop site revealed two Neolithic pits, an Iron Age ring ditch enclosure, 51 graves and four probable funerary enclosures. A ditch at the southern extent of the site appeared to demarcate a boundary. The funerary enclosures were located north of this, with the graves clustered farther to the north still. The form of the graves in the cemetery makes the main period of burial likely to have been Early medieval, but the artefact assemblages and radiocarbon dates obtained from the grave fills have not confirmed this hypothesis. A broad range of dates was obtained, all being earlier than the Early medieval period. The site may have been an important area for funerary activity going back into prehistory. No human bone survived, but judging from the size of the graves the cemetery may have been used mainly for children and neonates.

Stratigraphy

3.3.18 The main phases identified on the site are as follows:

1. Period 2 - Neolithic activity evidenced by the recovery of a polished axe fragment;
2. Period 3 - A probable Iron Age roundhouse structure with associated features;
3. Period 5 - A potential early medieval cemetery; and
4. Features of undetermined date.

3.3.19 In general, the site had few stratigraphic relationships. The funerary enclosures and graves have been given a provisional date of Early medieval based on form and comparison with other sites in the region. The absence of bone meant that it was not possible to date the graves by scientific means. The C14 dating of material from the grave fills has neither confirmed nor disproved the postulated Early medieval date. Further stratigraphic refinement has little potential to reduce the degree of remaining uncertainty about the date range of the funerary activity.

Artefacts

3.3.20 Brython Archaeology used a collection strategy in which almost all categories of find were located and treated as Small Finds. In Table 17, therefore, with the exception of the slate, the distinction between bulk finds and small finds is non-existent.

Table 17 Quantification of finds assemblages from Area 7

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray

Fired Clay	Medium	1	0.015	1 to 10	0.037	2	0.015	3	0.067	Yes	Yes	Sue Thompson (WA)	No	No
Industrial Waste	Medium	0	0.000	11 to 50	0.224		0.000	11	0.224	Yes	Yes	Sue Thompson (WA)	No	No
Lithics	Medium	0	0.000	1 to 10	0.006	2	0.024	5	0.030	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	High	0	0.000		0.000	13	17.240	13	17.240	Yes	Yes	Sue Thompson (WA)	No	No
Slate	Low	14	104.459		0.000		0.000	14	104.459	No	No	Megan Stoakley (WA)	No	No
Iron	Low	0	0.000	1 to 10	0.003	3	0.226	2	0.229	No	No	Sue Thompson (WA)	Yes	Yes
Glass	None	0	0.000		0.000	1	0.011	1	0.011	No	No	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	0	0.000		0.000	5	0.069	5	0.069	No	No	Sue Thompson (WA)	No	No
CBM	Low	0	0.000		0.000	23	0.548	23	0.548	No	No	Sue Thompson (WA)	No	No
Pumice	None	0	0.000		0.000	2	0.023	2	0.023	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None	N.A.	N.A.	N.A.	0.043	N.A.	N.A.	N.A.	0.043	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.3.21 Five flints were recovered from Area 7. A single tertiary blade was recovered in the deposit (225). A knife fragment manufactured over a primary flake from a small pebble, with a steep, marginal and direct retouch was recovered from deposit (490). A mesial fragment of a polished axe was also recovered from the deposit (560), despite its state of conservation, we can define the axe as a thick-butted (type A), with a double-convex cross-section. Although the assemblage is very small and likely to be residual, they should at least be mentioned as part of a wider landscape survey alongside flints from other Wylfa sites, including Areas 1, 4, 5 and 17 as well as Hot Spots 5, 6 and 16. Illustration of at least three of these flints is recommended, including the polished axe fragment and knife fragment. When considered with other Wylfa sites, further analysis of these may contribute to archaeological research areas in the Neolithic and possibly Bronze Age periods, including domestic settlement patterns and prehistoric human agency.

3.3.22 Twelve worked stone artefacts were recovered from Area 7. The stone objects largely comprised rounded pebbles, which may have been utilised as polishing stones. A possible whetstone SF07.0004 was recovered along with refitting fragments of a large (granite?) saddle quern SF07.0013. Further analysis is recommended on these objects, to include comparative research and illustration. The stone small finds could be discussed in conjunction with stone assemblages from other Wylfa sites e.g. Areas 4, 19 and 20.

3.3.23 A small quantity of fired clay (n = 7) plus fragments of industrial waste recovered from three environmental samples were found in Area 4. It is stated in the original post-excavation assessment report that the industrial waste may comprise waste from fire

deposits and as such, further analysis would not contribute towards industrial practices and technologies. Similarly to the industrial waste recovered from Area 4, XRF analysis is not warranted here due to the very small quantity. Further analysis should only comprise a sentence as part of a wider landscape and settlement survey.

3.3.24 No further analysis is recommended on the post-medieval pottery, the ceramic building material, iron or glass.

Ecofacts

Total samples 377 (1211 tubs) 13552 kg (8803 l)

3.3.25 CPR was present in relatively large quantities in eight of the Brython non-grave sample which should all be taken to full analysis once absolute or typological dating for the features has been undertaken. Four of these samples yielded over one hundred CPR which were:

- Sample <7.0116> from upper fill (07.0360) of ditch slot [07.0362]; sample <07.0118> from lower fill (07.0361) of ditch slot [07.0362] and sample <07.0192> from base (07.0459) from ditch slot [07.0276] all of which came from Barrow 1.
- Sample <07.0358> from fill (07.0666) out of posthole [07.0665].

3.3.26 Two samples yielded over three hundred CPR which were:

- Sample <07.0072> from lower fill (07.0260) in boundary ditch [07.0261]; and
- Sample <07.0208> from fill (07.0513) in the barrow entrance terminus.

3.3.27 Two samples yielded over four hundred CPR which were:

- Sample <07.0071> from upper fill (07.0259) out of boundary ditch [07.0261]; and
- Sample <07.0076> from fill (07.0277) out of corner slot [07.0276].

3.3.28 The above samples should be submitted for radiocarbon assessment to secure absolute dates for these features as the site is classed as multi-period and therefore no period should be assumed for these features. Further dating of the assemblages listed above will attempt to narrow the date range for the site and assess if this assemblage can inform on crop husbandry and dietary practices in the wider Welsh landscape.

3.3.29 Six of the grave samples yielded over one hundred CPR, five grave samples yielded over two hundred CPR and one grave yielded over four hundred CPR. These may be

discounted for further analysis as these samples were taken for human bone recovery and not environmental purposes. The material is likely present due to being mixed into the backfill and would only be a consideration if dated through absolute means to fit it into the wider landscape and period it originally came from. Given that radiocarbon dates from the graves have returned prehistoric dates it is clear that the backfill is not contemporary to the rest of the site.

3.3.30 No CPR (charred plant remains) was present in the samples recovered from the Wessex excavations.

3.3.31 Only 6 samples yielded more than 4g of charcoal in the assessment reports from these three were submitted for radiocarbon dating. The dates returned were: sample <7.0035> taken from fill (7.0180) from the lower fill of ditch [7.0131] gave a mesolithic date. Sample <7.0092> taken from fill (7.0160) in pit [7.0159] returned a Neolithic to bronze age date. Sample <7.0203> from fill (7.0483) of cut [7.0484] returned an early medieval date. Based on these dates and the paucity of charcoal across the site no further work is recommended on the charcoal assemblage as it will not give much insight into past fuel procurement practices.

3.3.32 The shell recovered from the site was highly fragmented and not suitable for further analysis as it cannot inform on dietary practices or other human agency.

Radiocarbon dating

No. of radiocarbon results achieved: 8

Table 18 Area 7 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553556	oak charcoal	sample <07.0296> from fill (07.0554) of grave G042 [07.0555]	5250±30BP	4229-3976 cal BC	Late Mesolithic to Early Neolithic
Beta-553557	Oak charcoal	sample <07.0035> from lower fill (07.0180) of ditch [07.0131]	5630±30BP	4351-4369 cal BC	Late Mesolithic
Beta-553558	Oak charcoal	sample <07.0262> of fill (07.0574) of SW corner of Barrow 3 [07.0573]	1930±30BP	cal AD4-130	Late Iron Age to Early Roman
Beta-553560	Oak charcoal	sample <07.0092> of fill (07.0160) of pit [07.0559]	5030±30BP	3945-3714 cal BC	Early Neolithic
Beta-553561	Willow/poplar charcoal	sample <07.0277> from lower fill (07.0598) of pit [07.0559]	4900±30BP	3761-3638 cal BC	Early Neolithic
Beta-553562	Hazel charcoal	sample <07.0203> of fill (07.0483) of [07.0484]	1550±30BP	cal AD422-574	Early medieval
Beta-553563	Hazel charcoal	sample <07.0225> from fill (07.0536) of G032 [07.0536]	2880±30BP	1192-939 cal BC	Late Bronze Age
Beta-553564	Indeterminate charcoalified twig	sample <07.0254> from fill (07.0492) of C032 from Barrow 2 [07.0491]	6260±30BP	5317-5081 cal BC	Late Mesolithic
FAILED		Sample <07.076> of fill (07.0388)			

No. of further radiocarbon determinations recommended: 18

3.3.33 Nine samples were submitted for radiocarbon determination to aid in phasing of the site. One failed due to insufficient carbon.

3.3.34 A further suite of radiocarbon dates are recommended for this site. The quantities of charred plant remains from samples that are recommended for further environmental analysis, it is essential that these are radiocarbon dated prior to analysis of the remains occurring. It is recommended that the following are dated:

- Sample <07.0116> from fill (07.0360) of ditch [07.0362];
- Sample <07.0118> from fill (07.0361) of enclosure ditch;
- Sample <070192> from fill (07.0459) of enclosure ditch;
- Sample <07.0358> from fill (07.0666) of posthole [07.0665];
- Sample <07.0072> from upper fill (07.0260) of ditch [07.0261];
- Sample <07.208> from fill (07.0513) of [07.0512];
- Sample <07.0071> from upper fill (07.0259) of ditch [07.0261]; and
- Sample <07.0076> from fill (07.0277) of a ditch.

3.3.35 It is also recommended that the large (>100 items) charred plant remains assemblages from the grave fills are also dated. These are:

- Sample <07.0128> from fill (07.0387) of G07.018;
- Sample <07.0129> or <07.0396> from fill (07.0396) of G07.024;
- Sample <07.0230> from fill (07.0525) of G07.037;
- Sample <07.0244> from fill (07.0548) of G07.040;
- Sample <07.0288> from fill (07.0600) of G07.048;
- Sample <07.0297> from fill (07.0472) of G07.028;
- Sample <07.0182> or < 07.0183> from (07.0455) of G07.027;
- Sample <07.0305> from (07.0628);
- <07.0309> (07.0594) G07.046; and
- <07.0319> (07.0623) barrow fill.

Research

3.3.36

To understand how the remains seen within the investigation area relate to other known features across the landscape (chronologically, stratigraphically as well as spatially), with particular reference to the prehistoric activity in the fields to the south and west.

Prehistoric

There is an emphasis on understanding the wider settings of prehistoric sites – with specific reference to 'Understanding how sites work in the landscape, permanent/seasonal use and understanding the social role of hillforts' (Gale, 2010). It is possible that the remains within the proposed investigation area form part of the wider setting of the prehistoric remains seen in the adjacent field to the west (K1 and K4).

Placing the setting of the information gained from the archaeological investigation into a broader regional and national (including Britain and Ireland) context.

Gaining insights into social organisation and settlement hierarchies.

Early Medieval

The setting of the information gained from archaeological investigation into a broader regional and national (including Britain and Ireland) context.

Identifying, 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.

Gaining insights into the local farming economy and the wider exploitation of the natural environment – with particular reference to the exploitation of lakes and fens/bogs (such as the adjacent Tre'r Gof SSSI site) and the sea.

Area 9

Periods

Late Iron Age, Roman

Site summary

3.3.37 The excavation area contained evidence of an Iron Age settlement with continuity into the Roman period, dated by means of radiocarbon analysis. A small roundhouse was identified, accessed via a trackway. To the north, rectilinear post-built structures were recorded. A working area to the south-west and a pit cluster and midden activity to the south were also identified. Hearth dated Late Roman/Early medieval.

Stratigraphy

3.3.38 Area 9 occupation data should be combined with data from Area 11 (Field L1 West), Area 2 (Fields L8, L12 and L16), Area 19 (Field O5 North), and Area 20 (Field O5 South).

Artefacts

Table 19 Quantification of finds assemblages from Area 9

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray
Prehistoric Pottery	High	1	0.003		0.000	0	0.000	1	0.003	Yes	Yes	Frances Lynch	No	No
Roman pottery	High	40	0.281		0.003	0	0.000	40	0.284	Yes	Yes	Sue Thompson (WA)	No	No
Fired Clay	Low	0	0.000	11 to 50	0.162	0	0.000	0	0.162	No	No	Sue Thompson (WA)	No	No
Worked stone	High	3	3.096		0.000	0	0.000	3	3.096	Yes	Yes	Sue Thompson (WA)	No	No
Iron	Low	6	0.001	1 to 10	0.014	0	0.000	6	0.015	No	No	Sue Thompson (WA)	No	No
Copper Alloy	Low	1	0.053		0.000	0	0.000	1	0.053	No	No	Sue Thompson (WA)	No	No
Glass	Medium		0.000	1 to 10	0.001	0	0.000	1	0.001	Yes	Yes	Sue Thompson (WA)	No	No
Magnetically responsive	None				0.112				0.112	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.3.39 A single sherd of prehistoric pottery, weighing 3g, was recovered from the investigation at Area 9. A broad date of Iron Age to Roman was attributed to this fragment. Further work is recommended, including detailed fabric analysis; radiocarbon analysis of suitable palaeoenvironmental material from this context would be beneficial in narrowing down the date. Illustration is not recommended. The assemblage would benefit from its inclusion with other prehistoric pottery assemblages from the Wylfa site complex (e.g. Area 15, EV9, Hot Spot 14) as part of a wider landscape study, which would benefit research areas such as domestic settlement patterns and food consumption / storage.

3.3.40 Forty sherds of Roman pottery, weighing 281g, were recovered from the investigation at Area 9. Three grams of Roman pottery were also recovered from environmental samples. Further analysis is warranted on the Roman pottery, including the illustration

of diagnostic sherds and comparative research with other Roman finds assemblages from the archaeological complex at Wylfa as well as other archaeological sites in the wider vicinity.

3.3.41 Three stone artefacts, weighing 3,096g, were recovered from the investigation at Area 9. Of these objects, only one is worked and may comprise a possible quern stone. Further analysis on this artefact is recommended, including comparative research and illustration; whilst it does not merit a standalone report, it should be analysed and discussed with the other quern stones from the Wylfa site complex as part of a wider landscape study. The inclusion of this object as part of a wider discussion would benefit research areas such as domestic settlement patterns and grain production.

3.3.42 A single glass bead was recovered from an environmental sample <9007>. It does not merit a standalone report, but it would benefit from being included in a section on personal adornment alongside other such items e.g. the beads from Area 15. It should be illustrated and some comparative research should be undertaken.

3.3.43 A small assemblage of fired clay, weighing 162g, was recovered from Area 9. Whilst it does not merit a standalone report, it should be mentioned and discussed with the other fired clay assemblages from the Wylfa site complex as part of a wider landscape study. The inclusion of this object as part of a wider discussion would benefit research areas such as domestic settlement patterns, kiln activity and / possibly metal-working, although the latter is dubious as very little industrial waste or magnetic residue was recovered from the site.

3.3.44 No further work is recommended on the natural unworked stone, iron or copper alloy.

Ecofacts

Total samples 45 (109 tubs) 1050kg (600 l)

3.3.45 Charred plant remains (CPR) were present in 28 samples, of which nine yielded over 50 examples. Six of these nine are suitable for further analysis as they are either primary deposits or *in situ* burning and can therefore inform on crop husbandry in the iron to roman age Britain the site has been dated as from the initial radiocarbon results received. These are:

- Sample <9011> from fill (9217) out of pit [9216];
- Sample <9017> from fill (9226) out of pit/posthole [9225];

- Sample <9027> from fill (9228) out of pit/posthole [9227];
- Sample <9034> from fill (9256) out of posthole [9255]; and
- Samples <9044> from fill (9282) and <9047> from fill (9285) which were both recovered from pit/hearth [9279].

3.3.46 The remaining three samples yielding over 50 CPR examples can be discarded as they are from upper fills or dumps in construction cuts and are therefore unlikely to relate to the feature or the site at the time of occupation.

3.3.47 Charcoal as recovered from 39 samples of which six yielded ore than 10g of material. From these four are primary deposits and can inform on fuel procurement in iron age to roman Britain. These are:

- Sample <9017> from fill (9226) from pit/posthole [9225];
- Sample <9027> from fill (9228) from pit/posthole [9227]; and
- Samples <9044> from fill (9282) and <9047> from fill (9285) both from pit/hearth [9279].

3.3.48 The remaining two samples yielding over 10g of charcoal can be discarded as they were both from dumps in construction cuts and unlikely to relate to the iron to roman age occupation.

3.3.49 Sample <9044> has returned a roman date from radiocarbon submission which through association dates <9047>. The other recommended assemblages should be dated through absolute or typological means prior to full analysis being undertaken.

3.3.50 The shell was recovered from secondary and tertiary pit fills and is unlikely to relate to the original occupation for the site. However, should further stratigraphical work be undertaken on the contexts to assess whether it is archaeologically significant to a later period and can have the importance of the shell assemblage assessed for dietary practices in the wider landscape.

3.3.51 The animal bone was highly fragmented and is likely present as food waste. Due to the poor nature of the preservation no further work beyond the assessment already carried out is required.

Radiocarbon dating

No. of radiocarbon results achieved: 5

Table 20 Area 9 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553551	Charred wheat grain	sample <9006> from fill (9067) of pit [9066] yielded	2030±30BP	cal 155BC-AD334	Iron Age to Roman
Beta-553552	Charred barley grain	sample <9002> of tertiary fill (9043) of pit [9042]	2160±30BP	358-107 cal BC	Middle Iron Age
Beta-553553	Charred barley grain	sample <9044> from fill (9282) of hearth [9279]	1660±30BP	cal AD260-529	Roman to early medieval
Beta-553554	Privet charcoal	sample <9007> of fill (9148) of trackway [9147]	1780±30BP	cal AD137-334	Roman
Beta-553555	Oak charcoal	sample <9003> from fill (9107) of posthole [9106]	2100±30BP	197-47 cal BC	Mid to Late Iron Age

No. of further radiocarbon determinations recommended: 6

3.3.52 To aid phasing of the site five radiocarbon determinations were sought.

3.3.53 To facilitate the analysis of charred plant remains and/or charcoal the following further samples are recommended for radiocarbon submission:

- Sample <9011> from fill (9217) of pit [9216];
- Sample <9017> from fill (9226) of posthole [9225, would also aid in determining date for group {9200} which was attributed to the roundhouse;
- Sample <9027> from fill (9228) of pit/posthole [9227];
- Sample <9034> from fill (9256) of posthole [9255], would also aid in determining date for group {9200} which was attributed to the roundhouse;
- Sample <9044> from fill (9282) of hearth [9279]; and
- Sample <9047> from fill (9285) of hearth [9279].

Research

3.3.54 Excavation of the occupation site, and the ecofactual material recovered requires full analysis. This will provide fuller dating, characterisation and distribution of Late Iron Age to Roman activity on the site which will contribute to research aims on the wider setting of sites and exploitation of the natural environment. Full analysis of the appropriate environmental samples and the plant species present in the charred plant remains. Particularly focused on the Late Iron Age to Roman periods since the secure data relates to that era. This would include submitting any further material suitable for radiocarbon dating, to further refine the duration of the various features and obtain a better understanding of the site development.

Area 14

Periods

Late Mesolithic/Early Neolithic, Late Neolithic/Early Bronze Age

Site summary

3.3.55 Excavation revealed an occupation spread with associated pits and post holes, forming a distinct activity group. A significant assemblage of lithics dating to the Late Mesolithic/Early Neolithic corresponds well with the single radiocarbon date within the Early Neolithic. Periodic occupation appears to have continued, with nine sherds of pottery dated to the Late Neolithic/Early Bronze Age. Six further undated pits and three Early Medieval pits were also identified within Area 14, along with a Post-medieval rectilinear field system.

Stratigraphy

3.3.56 Area 14 data should be combined with data from other Areas including Areas 1, 2, 3 and Fields L3, C13, K4, K11 etc and will further enhance the recent regional review carried out by Kenny (2012).

Artefacts

Table 21 Quantification of finds assemblages from Area 14

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Prehistoric Pottery	High	9	0.089	0	0.000	0	0.000	9	0.089	Yes	Yes	Sue Thompson (WA)	No	No
Fired Clay	Low	15	0.192	0	0.000	0	0.000	15	0.192	No	No	Sue Thompson (WA)	No	No
Lithics	High		0.000	0	0.000	372	3.697	372	3.697	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	High	8	3.669	11 to 50	0.251	15	1.956	23	5.879	Yes	Yes	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	3	0.026	0	0.000	0	0.000	3	0.026	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None				0.017				0.017	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.3.57 Nine sherds of prehistoric, weighing 89g, were recovered from the investigation at Area 14. They are of mid-Neolithic to Early Bronze Age date. The recovery of prehistoric pottery on archaeological sites in Wales is rare and as such is of high archaeological significance. Further analysis is recommended on this assemblage, to include comparative research and illustration of all diagnostic sherds. The assemblage would benefit from its inclusion with other prehistoric pottery assemblages from the Wylfa site complex (e.g. Area 9, Hot Spot 11-13, Area 15, EV9, Hot Spot 14, Area 2) as

part of a wider landscape study, which would benefit research areas such as domestic settlement patterns and food consumption / storage. Radiocarbon analysis of palaeoenvironmental material from context (14003) would be beneficial for dating the pottery.

3.3.58 Eight stone objects, weighing 3,669g, were recovered during the archaeological investigation at Area 14. A further fifteen stone artefacts with a combined weight of 1,956g were recovered as small finds. A total of 251g of stone was recovered from environmental samples, which include rounded pebble fragments and a whetstone. Further analysis on these artefacts is recommended, including comparative research and illustration; while these finds merit a standalone report, they should be analysed and discussed with other stone assemblages from the Wylfa site complex as part of a wider landscape study. The inclusion of these objects as part of a wider discussion would benefit research areas such as domestic settlement patterns and grain production.

Lithics

3.3.59 A total of 372 (3412.47g) lithics was recovered during the archaeological excavation at Area 14. The site has produced an important lithic assemblage and should be reported on in full. This will give an opportunity to explore diverse themes relating to the nature, significance and scale of flint technology and its use, both at the site and within the wider landscape. Such themes include, but are not limited to:

- The chronology of flint and use at the site and continuities or disruptions in lithic-working traditions across the Mesolithic and Neolithic, choices made in the selection, acquisition and use of raw materials.
- Strategies and approaches were taken to lithic reduction the spatial and temporal organisation of lithic reduction and tool use, both at the site and within the wider cultural landscape
- The nature of the products and how these relate to the range of activities conducted at the site
- The nature of the deposition and discard of flint waste and useable products, and how these may relate to the wide r concerns of the communities using them.
- The significance of the flintwork merits it being published in some detail, alongside suitable illustrations. If possible, it would be academically advantageous to publish the findings from the site alongside the results from the overall Wylfa project.

- *Recommendations for future work.* In order to realise this potential, further work is recommended. This should concentrate on a full and detailed re-examination of the material and should include:
- recording in detail the typological, technological and metrical traits of the various significant assemblages, as well as the raw materials, condition and degrees of recortication.
- refitting exercises combined with a detailed examination of the micro-debitage on selected suitable assemblages, in order to elucidate pre-depositional history and discards patterns of the material.
- High-power examination of selected debitage for micro-wear traces to assess the degree to which unretouched flakes and blades may have been used.
- an examination of the contextual and distribution patterns of the assemblages.
- a consideration of the assemblages' relationships with other deposited materials, such as bone, pottery etc.
- discussing how the material compares and contrasts to other lithic assemblages from the region and the implications that this may have for broader settlement strategies and patterns of landscape exploitation.
- Research and compilation of Mesolithic and Early Neolithic assemblages from the region
- Research and compilation of raw material sources and products.

3.3.60 No further work is recommended on the post-medieval pottery and the post-medieval to modern fired clay.

Ecofacts

Total samples 15 (processing data for 10 only) (27 tubs processed) 331 kg (183 l)

3.3.61 Charred plant remains (CPR) were present in seven samples of which three yielded more than 10 examples which were:

- Sample <14001> from fill (14002) out of pit [14001];
- Sample <14003> from fill (14003) out of pit [14005]; and
- Sample <14103> from fill (14127) out of pit [14129].

3.3.62 Charcoal was present in 14 samples of which 5 yielded more than 5g of material which were:

- Sample <14001> from fill (14002) out of pit [14001];
- Sample <14101> from fill (14105) out of pit [14104];
- Sample <14102> from fill (14102) out of posthole [14106];
- Sample <14103> from fill (14127) out of pit [14126]; and
- Sample <14111> from occupation layer (14170).

3.3.63 Preliminary dates from radiocarbon from samples <14103> and <14111> yielded early medieval and early Neolithic radiocarbon ages respectively. In order assess the significance of the assemblages above they should all have further material submitted to get accurate dates for the deposits.

3.3.64 One small fragment of bone was recovered from the excavations and is not of archaeological significance either from the site or in the wider landscape.

Radiocarbon dating

No. of radiocarbon results achieved: 2

No. of failed samples: 1

Table 22 Area 14 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553493	Charred barley grain	sample <14103> tertiary fill (14127) of pit [14126]	1130±30BP	cal AD805-988	Early medieval
Beta-553494	Oak charcoal	sample <14111> from occupation layer (14170)	5020±30BP	3943-3710 cal BC	Early Neolithic
FAILED		sample <14003> from fill (14003) of pit [14005]			

No. of further radiocarbon determinations recommended: 3

3.3.65 Three radiocarbon determinations were sought to aid in phasing, however one did not produce enough carbon and subsequently failed.

3.3.66 To facilitate the analysis of the charred plant remains and charcoal as well as phasing issues it is recommended that the following are submitted for determination:

3.3.67 Charred plant remains:

- From sample <14001> from fill (14002) of pit [14001]; and
- From sample <14003> from fill (14005) of pit [14005].

3.3.68 Charcoal:

- From sample <14102> of fill (14102) from pit [14106].

Research

3.3.69 Excavation of the Early Neolithic to Bronze Age occupation site, associated surfaces and structures, artefacts and the recovery of ecofactual material requires full analysis. This will provide better characterisation and understanding of the activities and will

contribute to research aims on the wider setting of prehistoric sites and exploitation of the natural environment. Flint - choices made in the selection, acquisition and use of raw materials and nature of the products and how these relate to the range of activities conducted at the site. Full analysis of data from Area 14 should be utilised to consider issues discussed as part of the Framework 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 Neolithic and Bronze Age 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 land use and determining if there are detectable regional variations. dating, characterisation and pattern of historic field systems is identified as a specific research aim in the WSI (HNP 2015, 2016) and full analysis of the environmental evidence from the rectilinear field system may assist with providing a date for the remains which would help in understanding the development and degree of continuity of land divisions in Anglesey.

Area 19

Periods

Iron Age, Roman

Site summary

3.3.70 Area 19 contained evidence of an Iron Age settlement. The earliest features identified on site were of Late Bronze Age to Early Iron Age and included a building, a curvilinear wall, a stone-built structure, and three shallow deposits related to construction phases of the above listed structures. Also of Late Bronze Age and Iron Age date were nine post holes, one having wood in the fill and being radiocarbon dated to 788-537 BC, a possible round house, a pit with fill radiocarbon dated to 197-47 BC, a further 18 pits, three layers, a spread of heat activity, a ditch and a sediment accumulation of infilling deposits. A deposit of Post-medieval date and an undated ditch and 11 undated pits were also identified across the site.

Stratigraphy

3.3.71 The presence of several prehistoric strucutres, built one after the other, make this a settlement site of considerable importance. As with many of the sites on this scheme, stratigraphic phasing and absolute dating pose considerable challenges. Careful

attention needs to be paid to how the grouping of discrete settlement features can be refined.

Artefacts

Table 23 Quantification of finds assemblages from Area 19

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray
Fired Clay	Low	1	0.010	1 to 10	0.045	0	0.000	1	0.055	No	No	Sue Thompson (WA)	No	No
Industrial Waste	Low	1	0.063		0.000	0	0.000	1	0.063	No	No	Sue Thompson (WA)	No	No
Worked stone	High	0	0.000	1 to 10	0.220	0	0.000	1	0.220	Yes	Yes	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	1	0.012			0	0.000	1	0.012	No	No	Sue Thompson (WA)	No	No
Mortar/Burnt Earth	Low	0	0.000	11 to 50	0.186	0	0.000		0.186	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None	N.A.	N.A.	N.A.	1.925	N.A.	N.A.	N.A.	1.925	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.3.72 A whetstone or metal-working burnisher was recovered from an environmental sample <19009> of context (19064) of posthole [19063]. It is undated in the assessment report but there is a high probability that it is of Late Bronze to Iron Age date; this posthole forms part of an ancillary group {19198} which is a possible roundhouse. Further analysis, including comparative research and illustration, is recommended. The analysis should be discussed collectively with similar domestic stone artefacts from the other Wylfa sites; this analysis would benefit research areas such as domestic settlement patterns and land use as well as artefact scatters. Comparison with other similar artefacts may also tighten the date of the artefact.

3.3.73 The bulk finds from Area 19 comprise a single sherd of post-medieval pottery, a fragment of iron pyrites, a single fragment of fired clay and 12 flints, which were missing at the time of transfer to the WA Carlisle premises.

3.3.74 Finds from the environmental samples, collectively weighing 386g, included very abraded fragments of fired clay and mortar. No further analysis is recommended.

Ecofacts

Total samples 39 (80 tubs) 1127 kg (504 l)

3.3.75 A total of two charred plant remains (CPR) were recovered from sample <19035> from fill (19182) out of the wall cut [19181] in the roundhouse. The size of this assemblage is too small to be of any archaeological significance. No further work is recommended.

3.3.76 Charcoal was present in twenty-four samples and of these four have assemblages over 5g and are suitable for further analysis, which are:

- Sample <19002> from fill (19006) from deliberate backfill of pit [19004];
- Sample <19005> from fill (19032) out of dumped material in pit [19032];
- Sample <19021> from fill (19119) out of posthole [19118]; and
- Sample <19022> from secondary fill (19121) out of pit [19120].

3.3.77 From the three radiocarbon dates already received from the site (which includes secondary fill (19121) <19022>) they all returned iron age dates. I would recommend samples <19002>, <19005> and <19021> all have material selected for radiocarbon submission as these are assumed primary fills. Once absolute dating has been undertaken and the results received and assuming the dates ar also show these to be iron age deposits then full analysis of fuel procurement practices can be undertaken which can then be assessed in the wider Wylfa landscape.

Radiocarbon dating

No. of radiocarbon results achieved: 3

Table 24 Area 19 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554954	Oak charcoal	sample <19022> of secondary fill (19121) of pit [19120]	2100±30BP	197-47 cal BC,	Middle to Late Iron Age
Beta-554955	Oak charcoal	sample <19010> of fill (19065) of posthole [19063]	2170±30BP	360-116 cal BC	Early Middle Iron Age
Beta-554956	Oak charcoal	sample <19030> of secondary fill (19148) of posthole [19147]	2500±30BP	788-537 cal BC	Early Iron Age

No. of further radiocarbon determinations recommended: 3

3.3.78 Three radiocarbon dates were requested for this site, which helped to demonstrate that it was occupied exclusively during the Iron Age.

3.3.79 Further radiocarbon determinations are recommended to aid in charcoal analysis and tighten chronologies for phasing. Although only charcoal it is recommended, an effort has been made to select the short-lived species for submission. The following are samples recommended for submission are:

- <19002> from fill (19006) of pit [19004]
- <19005> from fill (19032) of pit [19032]
- <19021> from fill (19119) of posthole [19118]

Research

3.3.80 Excavation and ecofactual material require full analysis, providing fuller dating, characterisation and distribution of Iron Age activity on the site which will contribute to research aims on the wider setting of sites and exploitation of the natural environment. Analysis of targeted 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 Iron Age since the secure data relates to that era.

EV9 cable diversion sites

3.3.81 Three sites were encountered along the route of the EV9 cable diversion. The write-up of the EV9 sites had already been largely completed when Wardell Armstrong took charge of the post-excavation assessment. The format of the assessment report has meant that recommendations for the artefacts, ecofacts and further radiocarbon dating have had to be made for the three sites together.

Fields 1 & 2

Periods

Neolithic, Late Bronze Age, Early Iron Age

Site summary

3.3.82 Fields 1&2 contained features of Early Bronze Age date including a cluster of three pits, a cluster of five pits, a spread and a gully.

Stratigraphy

3.3.83 Early Bronze Age - cluster of pits in field 2 will contribute to evidence of settlement during this period.

Research

3.3.84 Ecofact assemblage has potential to provide useful information about human-woodland interactions in early prehistoric Wales.

EV9 Fields 9A & 9

Periods

Late Bronze Age

Site summary

3.3.85 Excavation revealed a Late Bronze Age house.

Stratigraphy

3.3.86 Late Bronze Age - radiocarbon dates need to be secured for relevant features from fields 9 and 9A and reviewed in conjunction with comparable archaeological sites investigated within the Wylfa Newydd development boundary.

EV9 Field 14

Periods

Neolithic

Site summary

3.3.87 Field 14 contained features of Late Neolithic date, including a cluster of nine pits, a cluster of three pits and two ditches.

Stratigraphy

3.3.88 Late Neolithic - pit cluster in field 14 has a role to play to contribute to the understanding of settlement during the Neolithic within Anglesey and North Wales.

Artefacts

Table 25 Quantification of finds assemblages from the EV9 Cable Diversion sites

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Prehistoric Pottery	Very high	800	1.386	0	0	0	0	800	1.386	Yes	Yes	Frances Lynch	No	No
Lithics	High	0	0.540	0	0	0	0	0	0.540	Yes	Yes	George Smith (Freelance)	No	No
Worked stone	High	0	3.102	0	0	0	0	0	3.102	Yes	Yes	Not given	No	No
CBM	Low	0	0.021	0	0	0	0	0	0.021	No	No	Not given	No	No
Metal (not specified)	Low	0	0.101	0	0	0	0	0	0.101	No	No	Not given	No	No

3.3.89 Finds recovered from the EV9 Cable diversion are split between Fields 1 and 2, Fields 9 and 9A and Field 14. They include pottery (1,386g), flints (540g) and stone (3,102g) as well as small quantities of CBM, animal bone and metal (101g). The artefact counts for these finds are not available.

3.3.90 The vast bulk of the pottery is Late Neolithic in date and comprises Grooved ware and Fengate ware, with a scattering of EBA & LBA material. Further analysis is warranted

and will include comparative research and illustration of diagnostic sherds such as rims and bases as well as any decoration. Prehistoric pottery is rare in archaeological sites in Wales and this pottery represents a significant assemblage. This assemblage should be discussed and contextualised with the other prehistoric pottery assemblages from the remainder of the Wylfa site complex. There does not appear to be any mention of organic residues or carbonised accretions on any of the sherds, which would rule out lipid analysis. This analysis will contribute towards 'settlement patterns' and house 'layouts' – houses during this period are characterised by features such as pits, postholes, stakeholes, hearths and artefact scatters. The pit cluster in Field 14 and any associated artefacts will be important in contributing to these research areas.

3.3.91 Further analysis and illustration are warranted on the flint assemblage; the majority of the assemblage is of Late Neolithic to Early Bronze Age date with debitage and tools. The latter category especially will require illustration, to include tools such as scrapers, serrates, burins, cores etc. This analysis could contribute towards research areas such as settlement patterns and artefact scatters in the Early Bronze Age; there is an apparent lack of evidence for settlement in this period and the analysis of a discrete cluster of pits in Field 2 will contribute to this.

3.3.92 Further analysis, including comparative research and illustration of the stone artefacts is warranted, including whetstones / polishing stones. A stone mace head of Late Neolithic date was recovered during a soil strip in Field 14, which should be analysed and illustrated. It should be discussed in context with other mace heads recovered from any other Wylfa sites; this may address one of the identified research areas, which states that there needs to be a refinement of knowledge about the sources and distribution of Late Neolithic to Early Bronze Age mace heads and axes across Wales (RFAW 2017, 14). Any fragments of quern or rubbing / whetstones should be analysed and illustrated; they should be discussed alongside other stone.

3.3.93 Burnt bone, metal and ceramic building material is not of archaeological significance – the burnt bone could be mentioned as charred domestic food waste

3.3.94 Within the wider landscape, finds assemblages from EV9 could be analysed and discussed alongside sites such as Areas 20 and 19 as well as HS 14. For instance, a possible mace head was recovered from hillwash (20004) from Area 20 which could constitute a good comparison.

Ecofacts

3.3.95 Total samples 97 (171 bags, but value not given for all samples; unknown weight, 1,431.75 l, but volume not given for all samples)

3.3.96 A total of 2,310 charred plant remains were recovered from EV9 these were split between 71 cereal grains, 103 cereal chaff, 136 wild weed seeds and 2000 hazelnut shell fragments.

3.3.97 The hazelnut is a particularly important material as it was not recovered from the other Wylfa excavations. In total hazelnut was recovered from fifty-nine samples and was recovered in numbers over 50 from eight of these, which were:

- Samples <17> and <30> both out of fill (51) in waste pit [52];
- Samples <19> and <33> both from fill (71) out of waste pit [72];
- Sample <23> from fill (79) out of pit [80];
- Sample <31> from fill (69) out of pit [70]
- Sample <32> from fill (83) out of primary fill of waste pit [70]; and
- Sample <34> from fill (109) out of pit [80].

3.3.98 The three hazel nut fragments already submitted for 14c dating, from samples <3>, <17> and <19> returned Neolithic to early bronze age dates. Except for samples <17> and <30> from fill (51) and samples <19> and <33> from fill (72), as these have already returned radiocarbon dates. It is recommended that the remaining four samples listed above are submitted for absolute dating to confirm that the hazelnut is all Neolithic to bronze age in date which would allow enough evidence to assume the smaller assemblages of hazelnut are of the same period and the full assemblage of hazelnut from EV9 can be submitted for further analysis into local exploitation of a food source at Wylfa.

3.3.99 The chaff, cereal grain and weeds seeds were split across forty-four samples. Of these assemblages only five had more than 10 remains present, which were:

- Sample <60> from fill (164) out of pit/ posthole [163;
- Sample <68> from fill (181) out of pit/posthole [180];
- Sample <76> from single fill (200) out of ditch [198/199];
- Sample <73> from secondary fill (193) out of ditch [169/197]; and
- Sample <84> from secondary fill (217) out of ring ditch [219].

3.3.100 Sample <60> has returned an iron age date through radiocarbon dating. As this date is later than the hazelnut activity it is recommended that the remaining four

samples listed above are submitted for 14c dating to get an accurate date for deposition. Once received these four assemblages should be analysed in context of the wider landscape crop husbandry practices.

3.3.101 No further work is recommended on the smaller assemblages of cereals and weed seeds.

3.3.102 Charcoal was present in ninety-five samples with total quantity of 5041 fragments. From these fifty-two yielded assemblages above 50 fragments. Forty of these are from features which allow for accurate dating of the site through being undisturbed primary deposits, these are:

- Sample <1> from fill (1) out of pit [2];
- Sample <2> from fill (3) out of pit [4];
- Sample <3> from fill (5) out of pit [5];
- Sample <17> and <30> from fill (51) out of waste pit [52];
- Samples <19> and <33> from fill (71) out of waste pit [72];
- Samples <21> from fill (69) and <32> from fill (83) both out of waste pit [70];
- Sample <28> from fill (63) out of ditch [64];
- Sample <29> from fill (87) out of pit [88];
- Sample <34> from fill (109) out of pit [80];
- Sample <35> from fill (103) out of posthole [104];
- Sample <37> from fill (109) out of posthole [110};
- Samples <39> from fill (107) and <40> from fill (113) both out of posthole [106];
- Sample <41> from fill (115) out of posthole [116];
- Sample <42> from fill (121) out of posthole [122];
- Sample <43> from fill (125) out of posthole [126];
- Sample <44> from fill (123) out of posthole [124];
- Sample <53> from fill (149) out of pit [150];
- Sample <54> from fill (152) out of a possible beam slot;
- Sample <58> from fill (160) out of posthole [159]
- Sample <59> from fill (162) out of posthole [161];

- Sample <60> from fill (164) out of posthole/pit [163];
- Sample <64> from fill (171) out of pit [172];
- Sample <65> from fill (173) out of posthole [174];
- Sample <66> from fill (175) out of stakehole [176];
- Sample <67> from fill (179) out of posthole [178];
- Sample <68> from fill (181) out of pit/posthole [180];
- Sample <69> from fill (185) form pit/posthole [184];
- Sample <70> from fill (187) out of pit [186];
- Sample <71> from fill (188) out of posthole [189];
- Sample <72> from fill (190) out of ditch [191];
- Sample <76> from fill (200) out of ditch [169/197];
- Sample <77> from fill (201) out of ditch [202];
- Sample <85> from fill (218) out of ditch [219];
- Sample <887> from fill (222) out of stakehole [223];
- Sample <96> from fill (241) out of posthole [242]; and
- Sample <97> from fill (215) out of posthole [216].

3.3.103 As a single fragment of charcoal from sample <75> returned an iron age date, and none of the above samples have been dated, it is recommended that:

- Samples <77>, <76> and <85> are submitted for dating the ditch and then all the material from the ditch can be analysed as these samples are from various slots.
- Samples <66>, <59> and <42> are submitted to date the postholes within the ditch by association.
- Samples <64>, <2> and <35> are from various sets of pits outside the ditch and will date the backfill and the other pits through association.
- Samples <17> and <33> are classed as waste pits and should also be submitted for 14c to assess whether this backfill is from the same period as the other ditches.

3.3.104 Once all these dates are received the material from all the above samples can be fully analysed for fuel procurement practices within the wider landscape.

3.3.105 The remaining twelve charcoal samples were not deemed suitable for submission, as they were either from secondary fills or from features disturbed through bioturbation.

3.3.106 Animal bone was in extremely small fragments generally under 1g in weight and are not deemed suitable for further analysis.

Radiocarbon dating

No. of radiocarbon results achieved: 5

Table 26 EV9 cable diversion radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
SUERC-92506 (GU55266)	Charred hazel nutshell	sample <3> from fill (5) of pit [6]	3509±27BP	1908-1750 cal BC	Early Bronze Age
SUERC-92507 (GU55267)	Charred hazel nutshell	sample <17> from fill (51) of waste pit [52]	4394±27BP	3091-2921 cal BC	Middle Neolithic
SUERC-92508 (GU55268)	Charred hazel nutshell	sample <19> from fill (71) of waste pit [72]	4449±27BP	3335-3012 cal BC	Middle Neolithic
SUERC-92509 (GU55269)	Indeterminate charred plant remain	sample <60> of fill (164) of posthole [163]	2880±27BP	1189-943 cal BC	Late Bronze Age
SUERC-92513 (GU55270)	Hazel charcoal	sample <75> of fill (195) of ditch [197]	2841±27BP	1107-919 cal BC	Late Bronze Age

No. of further radiocarbon determinations recommended: 11

3.3.107 Further recommendations for radiocarbon submission are based mainly on plant economy as it is thought that the phasing on EV9 was relatively secure. The following have been recommended.

3.3.108 Hazel nutshell is not evident from any other site. Two fragments were dated for the assessment and returned slightly different dates. By examining the remainder it may be possible to see the extent of time that they were exploiting wild food, therefore, further dates using hazel nutshell fragments on the following are recommended:

- From sample <23> from fill (79) of pit [80];
- From sample <31> from fill (69) of pit [70];
- From sample <32> from fill (83) of pit [70]; and
- From sample <34> from fill (109) of pit [80].

3.3.109 Further dates from the charred plant remains are also warranted prior to analysis. This would allow for chronological examination of crop husbandry practices in comparison to wild food exploitation. Using plant remains for submission from the following:

- Sample <60> from fill (164) of pit/ posthole [163;
- Sample <68> from fill (181) of pit/posthole [180];
- Sample <76> from fill (200) of ditch [198/199];

- Sample <73> from secondary fill (193) of ditch [169/197]; and
- Sample <84> from secondary fill (217) of ring ditch [219].

Finally, two more dates should be sought from postholes to improve confidence in site chronology.

Hotspot 11/13

Periods

Late Neolithic, Early Bronze Age, Early Medieval

Site summary

3.3.110 Excavations revealed an Early medieval cemetery containing 19 graves aligned east to west. No human bone survived. The earliest archaeological features encountered dated to the Neolithic/Early Bronze Age. These included two groups of intercutting pits, two small linear gullies and a line of rubble (potentially a wall). A further pit, a small oven/furnace with associated flue and 30 stake holes in clusters of four, possibly used as a windbreak for the furnace/oven. A ditch feature post-dated the Neolithic/Bronze Age activity, but pre-dated the Early medieval cemetery. Judging by the size of the grave cuts alone, ten of the graves would have accommodated adults and eight juveniles. Fifteen of the graves had evidence of cists. A Post-medieval square enclosure with entrance was identified north of the site through radiocarbon analysis, which returned a date of AD 1725-1814.

Stratigraphy

3.3.111 Prehistoric activity was concentrated in the lower lying areas to the southwestern corner of the excavation area. Pottery recovered from the features and deposits in this area suggest that the activity probably dates to the Late Neolithic or Early Bronze Age. A group of nineteen graves, likely to have accommodated ten adults and eight infants or neonates, was an unexpected discovery within the Hotspot. Four of the graves were simple earth cut examples and fifteen included cists of local schist. The style of the graves is typical of the early medieval period in North West Wales, and two cemeteries likely to be of a similar date have been excavated during the current phase of works at the Wylfa site at Wylfa Head (to the north-east) and Area 7 (to the west). However, unlike the cemeteries at Wylfa Head and Area 7, the Hotspot 11-13 cemetery was located on low-lying land at the edge of fairly marshy ground. This may suggest that the cemetery represents a family group. No dating evidence was

recovered from the gullies which formed square or rectangular enclosures. Physical relationships determined that some of the gullies post-dated a number of graves at the cemetery but firm dating could not be established and determining the chronology for archaeological remains recorded at Hotspot 11-13 with any certainty is difficult without data from the environmental samples.

Artefacts

Table 27 Quantification of finds assemblages from Hotspot 11/13

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Prehistoric Pottery	High	0	0.000	0	0.000	41	0.375	41	0.375	Yes	Yes	Sue Thompson (WA)	No	No
Industrial Waste	Low	0	0.000	1 to 10	0.001	0	0.000		0.001	No	No	Sue Thompson (WA)	No	No
Worked stone	High	0	0.000	0	0.000	3	0.041	3	0.041	Yes	Yes	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	0	0.000	0	0.000	4	0.036	4	0.036	No	No	Sue Thompson (WA)	No	No
CBM	Low	1	0.005	0	0.000	0	0.000	1	0.005	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	Medium				0.052				0.052	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.3.112 A total of 41 sherds of prehistoric pottery, weighing 375g, were recovered from Hot Spot 11/13. The pottery dates from the Late Neolithic to Early Bronze Age. The recovery of prehistoric pottery on archaeological sites in Wales is rare and as such is of high archaeological significance. Further analysis is recommended on this assemblage, to include comparative research and illustration of all diagnostic sherds. The assemblage would benefit from its inclusion with other prehistoric pottery assemblages from the Wylfa site complex (e.g. Area 15, EV9, Hot Spot 14) as part of a wider landscape study, which would benefit research areas such as domestic settlement patterns and food consumption / storage.

3.3.113 Three stone finds, weighing 41g, were recovered from the Hot Spot 11-13 investigation. It was noted in the original assessment report that these finds could be of late post-medieval date, but this is uncertain. While these artefacts do not merit a standalone report, further analysis is recommended, including comparative research and illustration. This small collection would benefit from its inclusion with other worked stone assemblages from the Wylfa site complex part of a wider landscape study, which would benefit research areas such as domestic settlement patterns and grain processing.

3.3.114 No further work is recommended on the late post-medieval to modern pottery, burnt and unburnt animal bone, industrial waste or ceramic building material.

Ecofacts

Total samples 87 (379 tubs) 4374 kg (2843 l)

3.3.115 Charred plant remains (CPR) were recovered from forty-nine samples of these only three have assemblages of over thirty examples which will allow some information on past crop husbandry practices once out into a wider landscape context. These are:

- Sample <68> from fill (113.0135) out of stone feature [113.0136];
- Sample <80> from fill (113.0170) out of flue [113.0169] linked to stone structure [113.0136]; and
- Sample <85> which is out of the cut of pit [113.0173].

3.3.116 Charcoal was present in eighty samples of which twelve had assemblages above ten grams. Of these twelve, eight are deemed suitable for further analysis as they have assemblages large enough to inform on past woodland management and fuel procurement practices. These are:

- Sample <84> from fill (113.0174), sample <85> from charcoal layer (113.0176) and sample <86> from grey layer (113.0177) all taken from pit [113.0173];
- Sample <90> from a black deposit (113.0182);
- Sample <76> from fill (113.0156) out of pit [113.0160];
- Sample <82> from fill (113.0144) out of pit [113.0147];
- Sample <87> from charcoal rich fill (113.0185) out of pit [113.0183]; and
- Sample <69> from fill (113.0141) out of pit [113.0140].

3.3.117 The remaining four samples that yielded large charcoal assemblages were all from fill (113.0113) which was out of a single grave. As the samples were taken for the recovery of human remains and not ecofactual material which is likely to be later backfill these samples can be discarded.

3.3.118 Of the samples listed above for further work for both CPR and charcoal analysis, only sample <90> was sent for radiocarbon submission and returned a Neolithic-bronze age date. The other radiocarbon submissions have returned a range of dates from the industrial/modern era back to the late Neolithic/early bronze age.

Due to this it is recommended that all the listed samples are submitted for absolute dating prior to any further analysis being undertaken.

Monoliths

3.3.119 Three profiles of the same section 113.0173 were sampled for site formation processes. These were then sent to geoarchaeologist Mike Allen for assessment (Nelson-Viljoen and Macrow, 2020e: Appendix V). A summary of the results is included below. Sub-samples were taken for analysis of pollen and diatoms, should further work be recommended. It is recommended that soil thin-sections be produced during the analysis phase.

3.3.120 Profile 147 had 5 monoliths removed which were <91>, <92>, <93>, <94> and <95>. Profile 146 had 5 monoliths removed which were <102>, <103>, <104>, <105> and <106>. Profile 145 had 6 monoliths removed which were <96>, <97>, <98>, <99>, <100> and <101>. Of these only profile 145 was deemed suitable for sub-samples as profiles 146 and 147 were hammered in and the material disturbed or loose.

3.3.121 A total of 21 sub-samples were removed from profile 145 of which 17 were for pollen at 40mm intervals, 5 for diatoms at 80mm intervals and 1 for charcoal which was classed as residual and not suitable for radiocarbon submission.

3.3.122 From these pollen samples from depths (cm) 8, 16, 24, 32, 40, 48, 56, 64 and diatoms from depths (cm) 44, 56 and 68.

3.3.123 Two interpretations could be clarified and amplified by soil micromorphological analysis. These are the presence of a stasis represented by the surface on which charcoal layer 207 rests, and the alluvial and pedogenic nature of the 'alluvial soil' 148. To address these points, samples 098 and possibly 099 [of the contact of the charcoal-rich layer (2017) and colluvium (148)] and samples 099 and 100 [of the alluvial soil] should have soil thin-sections manufactured to allow soil micromorphological analysis.

Radiocarbon dating

No. of radiocarbon results achieved: 6

Table 28 Hotspot 11/13 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553497	Oak charcoal	sample <48> of fill (113.0080) of ditch	140±30BP	cal AD1669-1944	Post-medieval

Beta-553498	Ash charcoal	sample <2> of fill (113.0007) of ditch	180±30BP	cal AD1652-post1950	Post-medieval to modern
Beta-553499	Hazel charcoal	sample <90> from deposit (113.0182)	4860±30BP	3704-3539 cal BC	Early Neolithic
Beta-553500	Prunus sp. charcoal	sample <1> of fill (113.0002) from pit [113.0001]	3750±30BP	2281-2038 cal BC	Early Bronze Age
Beta-554183	Charred oat grain	sample <31> from fill (113.0055) of grave G007	670±30BP	cal AD1274-1391	Medieval
Beta-554184	Charred barley grain	sample <6> of fill (113.0021) of grave G0001	1880±30BP	cal AD66-222	Roman

No. of further radiocarbon determinations recommended: 11

3.3.124 Six radiocarbon determinations were sought for aiding in phasing during the assessment stage.

3.3.125 Recommendations for further radiocarbon determinations are based solely on the requirements for charred plant remains and charcoal analysis. Pit [11.0136] has multiple fills (n=4) recommended for dating; this would enhance the siting of site formation processes. No material was available to aid in tightening the chronology for the prehistoric pottery. Further dates are required from:

3.3.126 Charred plant remains from:

- Sample <68> from fill (113.0135) of stone feature [113.0136];
- Sample <80> from fill (113.0170) of structure [113.0136]; and
- Sample <85> from charcoal layer (113.0176) of pit [113.0173].

3.3.127 Charcoal (shortest lived species) from:

- Sample <69> from fill (113.0141) of pit [113.0140];
- Sample <76> from fill (113.0156) of pit;
- Sample <82> from fill (113.0144) of pit;
- Sample <84> from fill (113.0174) of pit [113.0173];
- Sample <85> from layer (113.0176) of pit [113.0173];
- Sample <86> from layer (113.0177) in pit [113.0173];
- Sample <87> from fill (113.0185) of pit [113.0183]; and
- Sample <90> from deposit (113.0182).

Research

3.3.128 Archaeological remains will expand on our understanding of the archaeology of the Isle of Anglesey regarding the regional research framework of Wales. Combine

the various datasets already produced into a searchable database that can allow the information.

Archaeological, Map and sample objectives:

- Placing the setting of the information gained from the archaeological investigation into a broader regional and national (including Britain and Ireland) context.
- Identifying, 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.
- Gaining insights into the local farming economy and the wider exploitation of the natural environment – with particular reference to the exploitation of lakes and fens/bogs (such as the adjacent Tre'r Gof SSSI site) and the sea.
- Gaining insights into long distance trade (via the analysis of recovered artefacts) especially in such products as pottery, glass and metalwork.
- Establishing the extent of continuity or discontinuity between the late Roman and Early Medieval periods via analysis of environmental evidence (RO8), the agricultural economy (RO8), the artefacts recovered (RO2) and changes in settlement patterns (RO6), trade (RO9) and burial/funeral practices (RO5).
- Understanding how the transition between the Late Roman and Early Medieval period on Anglesey (RO10) compares with the same period elsewhere in Wales and Britain.
- Understanding what, if any, impact Irish and Scandinavian populations had on (Early) Medieval Wales (artefacts, agricultural economy, funerary practices etc).
- As the excavations revealed layers of colluvium with inclusions of prehistoric pottery, lithic artefacts and associated debitage the following archaeological research questions identified in the WSI for Strip, Map and Sample areas (Horizon Nuclear Power, 2017) are also relevant:

<u>Prehistoric;</u>

- What is the functional and stratigraphic relationship between the burnt mounds/spreads and other spatially associated features in particular reference to possible structural features (post holes) and ditch type features ('troughs')?
- What relationships or patterns, if any, can been seen between these prehistoric features and their wider landscape setting?
- What evidence do the ditch features provide for prehistoric landscape organisation and enclosure?
- What is the relationship between the ditches and other prehistoric features such as settlement features and burnt mounds/spreads?
- What relationships or patterns, if any, can been seen between these potential prehistoric features and their wider landscape setting?
- What types of artefacts are present in the SMS zones?

- What can these artefacts tell us about daily life and ritual activity?
- Were those artefacts, which may be found in the SMS Zones, produced locally?

Hotspot 14

Periods

Bronze Age, Post Medieval

Site summary

3.3.129 Hotspot 14 contained the ephemeral remains of an Early Bronze Age roundhouse at the edge of what was once a wetland environment. The removal of a deposit revealed a stony surface containing Bronze Age pottery. A roundhouse was identified consisting of six post holes, and a central hearth. A stake hole and ten post holes created a wind break for the roundhouse and a curved gully was probably used as a drip gully for rainwater running off the roof. A fill of the central hearth was radiocarbon dated to 1954-1741 BC (Early Bronze Age).

Stratigraphy

3.3.130 The evaluation identified a presumed Bronze Age burnt mound and a series of related post holes in Trench 233 which became Hotspot 14. The identified roundhouse structure was defined by six postholes forming a circular structure around a central hearth and a semi-circular drip gulley upslope on its north east side. The Bronze Age pottery sherds discovered in one of the postholes, and dumped material for wetland consolidation, along with flint flakes from the drip gulley terminus suggest a Bronze Age date for activity at the site.

Artefacts

Table 29 Quantification of finds assemblages from Hotspot 14

Category	Significance	Bulk cnt	Bulk wgt	Enviro abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Prehistoric Pottery	High	0	0.000	1 to 10	0.015	13	0.229	13	0.244	Yes	Yes	Sue Thompson (WA)	No	No
Fired Clay	Medium	0	0.000	0	0.000	1	0.855	1	0.885	Yes	No	Sue Thompson (WA)	No	No
Industrial Waste	Medium	0	0.000	1 to 10	0.031	0	0.000	-	0.031	Yes	No	Sue Thompson (WA)	No	No
Lithics	Medium	3	0.004	0	0.000	0	0.000	3	0.004	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	High	0	0.000	0	0.000	1	0.011	1	0.011	Yes	Yes	Sue Thompson (WA)	No	No
Glass	Low	0	0.000	1 to 10	0.001	0	0.000	-	0.001	No	No	Sue Thompson (WA)	No	No
Heated Stone	Low	0	0.000	1 to 10	0.024	0	0.000	-	0.024	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	Low	N.A.	N.A.	N.A.	0.493	N.A.	N.A.	N.A.	0.493	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.3.131 Thirteen sherds of prehistoric pottery, weighing 119g, were recovered from Hot Spot 14 and have been dated as Late Neolithic to Early Bronze Age. Small sherds of prehistoric pottery were also recovered from environmental samples. The recovery of prehistoric pottery on archaeological sites in Wales is rare and as such this small assemblage of high archaeological significance. Further analysis is recommended on this assemblage, to include comparative research and illustration of all diagnostic sherds. The assemblage would benefit from its inclusion with other prehistoric pottery assemblages from the Wylfa site complex (e.g. Area 15, EV9) as part of a wider landscape study, which would benefit research areas such as domestic settlement patterns and food consumption / storage.

3.3.132 A single fragment of fired clay, weighing 885g, was recovered from the investigation at Hot Spot 14. While it does not merit a standalone report, this fragment should be analysed and discussed in conjunction with the fired clay assemblages from the other Wylfa sites as part of a wider landscape study. Illustration is not recommended.

3.3.133 Three lithics, weighing 3.76g, were recovered from Hot Spot 14. While it does not merit a standalone report, the lithics should be analysed and discussed in conjunction with the other lithic assemblages from the other Wylfa sites as part of a wider landscape study, which would benefit research areas such as settlement patterns and the use of tools and raw materials in the domestic environment. Illustration of the flints is recommended.

3.3.134 A small stone disc, weighing 11g, was recovered from Hot Spot 14. Crafted from volcanic tuff, it is likely to be a spindle whorl. Further analysis is recommended, including comparative research and illustration. While it may not merit a standalone report, its inclusion in the analysis and discussion of other spindle whorls and loom weights from the Wylfa site complex would be highly beneficial. Its incorporation into a wider landscape study would provide valuable information on textile production in the domestic environment.

3.3.135 No further work is warranted on the industrial waste, glass and unworked heated stone.

Ecofacts

3.3.136 Total samples 28 (47 tubs) 429 kg (296 l)

3.3.137 Charred plant remains were present in ten of samples, of these four had over 10 examples and are suitable for further work which are:

- Sample <9> from fill (114.0023) out of posthole [114.0024];
- Sample <11> from fill (114.0051) out of brown layer in hearth [114.0265];
- Sample <12> from fill (114.0053) from charcoal layer in hearth [114.0065]; and
- Sample <13> from fill (114.0050) out of posthole [114.0064] near hearth [114.0065].

3.3.138 Samples <11> and <13> were dated from the charcoal recovered from them and returned a radiocarbon date of early bronze age occupation. From this and all these features being primary deposits associated with the round house these assemblages of CPR can give us a clear insight into early bronze age crop husbandry and dietary practices.

3.3.139 Seven samples yielded more than ten grams of charcoal of which six were suitable for further analysis after typological or absolute dating has been undertaken. These are:

- Sample <1> from a charcoal layer (114.0002) in an unnumbered ditch;
- Sample <12> from fill (114.0053) out of charcoal layer in hearth [114.0065];
- Sample <13> from fill (114.0050) out of posthole [114.0064] near hearth [114.0065];
- Sample <22004> from fill (22016) out of gully terminus [22015];
- Sample <22009> from charcoal layer (22026) in ditch [22022]; and
- Sample <22010> for charcoal layer (22028) out of ditch [22027].

3.3.140 These six samples are all contemporary with the roundhouse and can give us insight into fuel procurement practices in the prehistoric Welsh landscape. As samples <11> and <13> have already been dated (see above) it can be assumed as all the features are close together and are topologically of the same period and that the ditches and gullies are related to the roundhouse. However, they may also be sent for absolute dating in order to confirm that the deposits are definitely from the same period as the roundhouse prior to full analysis being undertaken.

3.3.141 One sample yielding more than ten grams of charcoal was <22003> from fill (22012) which was descried as deliberate backfill. Provisionally this can be discarded from the analysis due to the exact nature of this feature being unclear. However, should further stratigraphical work be carried out and the status of this feature clarified then this sample may be factored back in as suitable for analysis.

Radiocarbon dating

No. of radiocarbon results achieved: 2

Table 30 Hotspot 14 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554178	Oak charcoal	sample <11> from layer (114.0051) in hearth [114.0065]	3540±30BP	1954-1767 cal BC	Early Bronze Age
Beta-554179	Rosaceae charcoal	sample <13> from fill (114.0050) of posthole [114.0034]	3490±30BP	1893-1700 cal BC	Early Bronze Age

No. of further radiocarbon determinations recommended: 7

3.3.142 Two radiocarbon determinations were recovered from HS14 to facilitate phasing.

3.3.143 To allow for the analysis of charred plant remains and charcoal further radiocarbon dates should be sought. Also prehistoric pottery (SF001, SF004, and SF0014) from (114.0002) and from sample <22004> of fill (22016) of gully terminus [22015] would benefit from a further refinement of their typological dates. The following are recommended:

3.3.144 From charred plant remains:

- From sample <9> of fill (114.0023) of posthole [114.0024]; and
- From sample <12> from fill of posthole [114.0063]

3.3.145 From charcoal (shortest-lived species preferred):

- From sample <1> from fill (114.002) of ditch;
- From sample <22003> from deliberate backfill (22012) of [22009];
- From sample <22004> from fill (22016) of gully terminus [22015];
- From sample <22009> from charcoal layer (22026) above ditch [22022]; and
- From sample <22010> from charcoal layer (22028) above ditch [22027].

Research

Q.1. Are the possible structural features associated with isolated structures or part of a larger settlement?

Q.4. What relationships or patterns, if any, can been seen between these prehistoric features and their wider landscape setting?

Q.5. What evidence do the ditch features provide for prehistoric landscape organisation and enclosure?

Q.7. What relationships or patterns, if any, can been seen between these potential prehistoric features and their wider landscape setting?

Q.8. What types of artefacts are present in the SMS zones?

Q.9. What can these artefacts tell us about daily life and ritual activity?

Q.10. Were those artefacts, which may be found in the SMS Zones, produced locally?

3.4 The 12 Class 3 sites (of medium archaeological significance)

Area 1

Periods

Late Neolithic, Early Bronze Age

Site summary

3.4.1 The Area 1 excavations recorded three burnt mound spreads 3 to 6 metres in diameter, and in close proximity to one another. Each was associated with a smaller trough roughly 1m maximum width. Two samples, one taken from the spreads and the other from the fill of one of the troughs of the south-western burnt mound, were radiocarbon dated. Both returned dates within the Late Neolithic to Early Bronze Age bracket.

3.4.2 A rectilinear field system was recorded to the north of the burnt mounds. Aside from tiny possible iron fragments, the fills of the ditches contained no artefactual or ecofactual evidence to allow the field system to be dated and the possibility that it was on temporary with the burnt mounds should be considered.

3.4.3 Finally, a circular feature located within the bounds of Area 1 and interpreted as a Neolithic henge was recorded in the 2012 geophysical survey conducted by Fugro Aperlo, but could not be identified archaeologically during the excavations. The geophysical anomaly was similar in size and dimensions to the henge found in Area 2,

on higher ground 200m to the southeast. It is possible that this putative henge was eroded away, as deposit is often lost from exposed upland areas.

Stratigraphy

3.4.4 No further work is required on the analysis of the stratigraphy and phasing. One day's work is required to integrate the archaeological features into the project GIS.

Artefacts

Table 31 Quantification of finds assemblages from Area 1

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray
Lithics	Medium	3	0.007	0	0.000	0	0.000	3	0.007	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Iron	None	2	0.004	0	0.000	0	0.000	2	0.004	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None	N.A.	N.A.	N.A.	0.004	N.A.	N.A.	N.A.	0.004	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.4.5 Three flints were recovered during the archaeological investigation at Area 1, which includes chert pieces, a flake and a thumbnail scraper which likely dates to the Early Neolithic. They were recovered from two contexts, which included Burnt Mound (1071) and fill (1028) of ditch [1079]. Further analysis is recommended; the flints will benefit from being considered alongside other areas with the wider project – e.g. a wider landscape study. Illustration of the flints is recommended. When considered with other Wylfa sites, further analysis of these will contribute to archaeological research areas in the Neolithic and possibly Bronze Age periods, including domestic settlement patterns and prehistoric human agency.

3.4.6 No further analysis is recommended on the two corroded iron fragments recovered from the field system.

Ecofacts

Total number of samples: 7 (28 tubs) 346 kg (169 l)

3.4.7 Charcoal was the only ecofactual material recovered and was present in abundance from all seven of the samples. The samples were taken from three burnt mound spreads and their associated troughs. Trough fill (1074) <1003> and its associated burnt spread (1071) <1004> were sent for radiocarbon submission and returned Bronze Age dates. (1071) <1007> is the same layer as <1004> which has already been dated with a total assemblage of charcoal weighing 108g.

3.4.8 Analysis of charcoal from the two radiocarbon-dated deposits is recommended along with burnt spread (1072) <1002> and its associated trough (1068) <1001>, and burnt spread (1070 <1005> and its associated trough (1077) <1006> which are all dated through association with the dated absolute dated features.

Radiocarbon dating

No. of radiocarbon results achieved: 2

Table 32 Area 1 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553547	Guelder rose charcoal	sample <1003> of fill (1074) of trough [1073]	3750±30BP	2281-2038 cal BC	Early Bronze Age
Beta-553548	Guelder rose charcoal	burnt mound spread (1071) <1004>	3740±30BP	2275-2035 cal BC	Early Bronze Age

No. of further radiocarbon determinations recommended: 2

3.4.9 Two radiocarbon dates have been returned for this area and were requested to aid in dating the burnt mound. These samples successfully dated the burnt mound. Sample <1004> was taken from a context, (1071), that also presented a piece of worked chert that originally been assigned a Neolithic date, so the radiocarbon date has helped refined the typological date.

3.4.10 The features that were sampled were the troughs and spreads associated with burnt mounds. The two radiocarbon determinations seemed to have originated from the pit/trough and its associated spread. Prior to the analysis of the charcoal it is recommended that a date from each of the other associated contexts are achieved; either <1002> or <1006> and one from either <1001> or <1005>.

3.4.11 No samples were taken from the fills of the rectilinear field system and thus it cannot be dated. Charcoal from an additional burnt mound spread, <1002> = (1072), could be sent for radiocarbon dating.

Research

3.4.12 While the information recovered from the burnt mounds is limited, they have been securely dated. The publication programme should include the burnt mound data from Area 1, combined with that from fields L1, C13, C16 and K4 and K11 and the cluster to the southwest. An overview of the data on burnt mounds from Wylfa

Newydd should be used to produce an article or book chapter that revisits the recent regional review carried out by Kenny (2012).

3.4.13 An attempt to interpret the undated field system in the context of dated field systems from nearby excavations should be made.

Area 3

Periods

Neolithic, Early Bronze Age, Roman

Site summary

3.4.14 Excavations revealed settlement activity and two burnt mounds dating to the Bronze Age, all in close proximity to a palaeochannel. Short stretches of gully and small pits and postholes were identified. The settlement was only partially observed, being larger than the excavated area, making interpretation of the remains difficult. Two radiocarbon dates were taken. The earliest feature was a small pit which returned an Early Bronze Age date. The other sample, taken from one of two burnt mound spreads was dated as Middle-Late Bronze Age.

Stratigraphy

3.4.15 One day's work is required to integrate the archaeological features into the project GIS.

Artefacts

Table 33 Quantification of finds assemblages from Area 3

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray
Prehistoric Pottery	High	1	0.005	0	0.000	0	0.000	1	0.005	Yes	Yes	Frances Lynch	No	No
Roman pottery	Low	1	0.005	0	0.000	0	0.000	1	0.005	Yes	Yes	Sue Thompson (WA)	No	No
Lithics	High	21	0.270	0	0.000	10	0.059	31	0.329	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	Medium	2	0.393	0	0.000	0	0.000	2	0.393	Yes	Yes	Sue Thompson (WA)	No	No
Copper Alloy	High	1	0.001	0	0.000	0	0.000	1	0.001	Yes	Yes	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	3	0.010	0	0.000	0	0.000	3	0.01	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None	N.A.	0.000	N.A.	0.038	N.A.			0.038	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.4.16 Further analysis and illustration (if a diagnostic sherd such as a rim) are recommended on the LBA pot sherd from (3020) (in conjunction with the other prehistoric pot sherds

from other sites such as Wylfa Head, HS 7-9 and EV9). Prehistoric pottery is rare on archaeological sites in Wales and full analysis is certainly recommended.

3.4.17 Further analysis is recommended on the 31 flints recovered from Area 3; at least 20 should be illustrated and should include the retouched tools and some of the more diagnostic debitage pieces. From a technological aspect, the assemblage, particularly the flakes and blade-like removals, likely dates to the Early Neolithic and the assemblage is made up of 87% debitage flakes and blades, 3.2% of cores and core fragments, 3.2% of retouched tools (including serrates and burin spalls) and others (6.4%).The flint analysis could comprise a standalone section but should also be considered with other flint assemblages from the Wylfa site complex.

3.4.18 A copper alloy needle or pin was recovered from (3093) <3024>; radiocarbon dating of another fill from the same trough feature has dated fill (3094) as Middle to Late Bronze Age. Further analysis, including comparative research and illustration, is recommended. Conservation will not be necessary as the object is stable. There is a question as to whether this pin is intrusive, so radiocarbon dating of palaeoenvironmental material from sample <3024> may be recommended.

3.4.19 Further analysis on the rubbing stone / whetstone recovered from fill (3077) of ditch terminus [3055] is recommended, including illustration and research for comparative examples. A broad date of Roman to early medieval was attributed to this so radiocarbon dating of any palaeoenvironmental material from the environmental sample of this fill (<3020>) would be beneficial in tightening its date.

3.4.20 No further analysis is recommended on the single abraded Roman pottery sherd or the post-medieval to modern finds assemblages.

Ecofacts

Total number of samples 24 (56 tubs) 713 kg (359 l)

3.4.21 Charcoal was present in nineteen of the samples but only six assemblages were deemed suitable for further analysis due to the size of the assemblages. These were from:

- fill (3012), sampled twice, <3005> and <3022>;
- fill (3015) <3011> from burnt spread cf. [3014], lining (3093) <3024> and fill (3096) <3026> both from trough [3092].

3.4.22 This charcoal once analysed should be able to give clear information into past fuel procurement practices.

3.4.23 Fill (3098) <3027> of fire pit [3097] yielded charcoal but had 20 charred plant remains; the only plant material observed within the samples Both the charcoal and plant remains should be taken to full analysis due this being a likely *in situ* food preparation site and can inform on both fuel procurement practices and diet.

Radiocarbon dating

No. of radiocarbon results achieved: 2

Table 34 Area 3 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553495	Oak charcoal	sample <3003> from fill (3008) of pit [11034]	3700±30BP	2199-1981 cal BC	Early Bronze Age
Beta-553496	Oak charcoal	sample <3025> from fill (3094) of trough [3092]	3020±30BP	1391-1131 cal BC	Mid to Late Bronze Age

No. of further radiocarbon determinations recommended: 2

3.4.24 The two dates were achieved to date the burnt mound. The radiocarbon age returned for <3025> placed it in the mid to Late Bronze Age. A date from sample <3024>, which was stratigraphically lower, may yield a date for the formation and early use of the feature. As oak charcoal was employed for the submission from sample <3025> an attempt must be made to acquire the shortest living species thus the charcoal would need to be identified first. A sample from either <3005> or <3011> may also be useful to tighten the period of use for this burnt-mound type feature.

3.4.25 It is recommended that a further two samples are sought.

Research

3.4.26 The burnt mound data should be combined with that from the other burnt mound sites encountered within the development area and used to further enhance the recent regional review carried out by Kenny (2012). A key element is the nature of the paleochannel and other water bodies adjacent to the site - were they freshwater or saltwater, flowing or still?

Area 5

Periods

Late Bronze Age, Modern

Site summary

3.4.27 Area 5 contained a burnt mound comprising two troughs and an overlying burnt deposit within the southern half of the excavated area. Two radiocarbon dates within the Late Bronze Age were obtained. Pits and post-holes to the east possibly represent an associated windbreak. A field clearance cairn within the northern part of the excavation area, and a boundary ditch and gully, at the eastern and western extents, likely dated to the Post-medieval/modern period and were the result of agricultural land improvements. There was a lack of artefactual material from all contexts, which meant that specific dating of the deposits or features identified on this basis was not possible.

Stratigraphy

3.4.28 No further work is required on the stratigraphy. Half a day's work required to add the features to the project GIS.

Artefacts

Table 35 Quantification of finds assemblages from Area 5

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray
Lithics	Medium	1	0.007	0	0.000	0	0	1	0.007	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Iron	Low	1	0.193	1 to 10	0.142	0	0	1	0.335	No	No	Sue Thompson (WA)	No	No
Glass	Low	11	0.112	0	0.000	0	0	11	0.112	No	No	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	20	0.352	0	0.000	0	0	20	0.352	No	No	Sue Thompson (WA)	No	No
CBM	None	6	1.004	11 to 50	1.928	0	0	6	2.932	No	No	Sue Thompson (WA)	No	No
Heated Stone	None	0	0.000	150 to 249	2.155	0	0		2.155	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None				0.028				0.028	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.4.29 The single flint debitage chip was recovered from subsoil (5002); this only warrants inclusion as a short sentence as part of the wider contextual and interpretative analysis. Illustration is not warranted.

3.4.30 No further analysis is recommended on the Victorian to modern finds.

Ecofacts

Total number of samples: 5 (14 tubs) 166 kg (92 l)

3.4.31 Charcoal was the only ecofactual material present in all the samples. The material from posthole fills (5042) <5004> and (5040) <5005> is of questionable deposition and in too small a quantity to be suitable for further work.

3.4.32 The charcoal from burnt mound (5009) <5001 and 5002> yielded 60g and trough (5046) <5003> yielded 134g. These two features have returned Bronze Age radiocarbon dates and the charcoal from the three samples relating to them is recommended for full analysis to examine Bronze Age fuel procurement practices.

Animal bone

3.4.33 Four fragments of animal bone were hand-collected during the excavation. These were poorly preserved and deemed to originate from cattle. No further analytical work is necessary.

Radiocarbon dating

No. of radiocarbon results achieved: 2

Table 36 Area 5 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554950	Rose charcoal	sample <5002> from structure (5009)	2870±30BP	1003-844 cal BC	Late Bronze Age
Beta-554951	Hazel charcoal	sample <5003> from fill (5046) of trough [5045]	2840±30BP	1108-916 cal BC	Late Bronze Age

No. of further radiocarbon determinations recommended: 0

3.4.34 The two samples were chosen to date the burnt mound. Although charcoal was observed in all the samples (five in total) three of them were related to the burnt mound. The two with the lowest charcoal-yield were from postholes. The weight of charcoal from these is not suitable for radiocarbon selection due to possible residuality.

3.4.35 The animal bone from this site was deemed poorly preserved and in a bad condition and therefore would not be suitable for radiocarbon submission.

No recommendations for further radiocarbon dating are made, as there is no suitable material.

Research

3.4.36 Area 5 burnt mound data should be combined with data from the other burnt mounds excavated as part of the Wylfa Newydd project and will further enhance the recent regional review carried out by Kenny (2012). Industrial era land improvements are of little value in themselves, however analysis of these in their relation to Industrial agricultural practices across the entire development area would be beneficial to the archaeological record and contribute to the research framework priority of mapping landscape change in this period.

Area 8

Periods

Prehistoric

Site summary

3.4.37 Area 8 contained a Middle to Late Bronze Age burnt mound with an associated trough and a second trough with six stakeholes. A double-ditched field boundary located on early OS maps and identified as a clawdd boundary during the evaluation, was recorded, along with a modern field drain.

Stratigraphy

3.4.38 No further work required on the stratigraphy. Half a day's work required to add the features to the project GIS.

Artefacts

Table 37 Quantification of finds assemblages from Area 8

Category	Significance	Bulk cnt	Bulk wgt	Enviro cnt	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Worked stone	Medium	0	0.000	0	0.000	1	0.103	1	0.103	Yes	Yes	Sue Thompson (WA)	No	No
Magnetically responsive	None	0	0.000		0.002	0	0.000		0.002	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.4.39 Small Find 1 comprises a slate loom weight which is associated with a Middle to Late Bronze Age burnt mound. Further analysis is recommended on the artefact, including comparative research and illustration. It should perhaps be analysed alongside any other loom weights and spindle whorls from other Wylfa sites as part of a wider prehistoric landscape study e.g. with HS 8.

Ecofacts

Total number of samples: 4 (14 tubs) 175 kg (114 l)

3.4.40 Charcoal was the only ecofactual material and was recovered from all four samples in relatively large quantity. The material from fill (8.0022) <8.0002> must be discounted, as it is likely deposited through a later backfill of the site and not related to the perod of human occupation.

3.4.41 The charcoal from trough fill (8.0018) <8.0003> was submitted for radiocarbon and returned a Bronze Age date. This trough was within burnt mound (8.0003) <8.0001> and therefore these two features can safely be associated to the same period. The combined 80g of charcoal from these two samples should be fully analysed.

3.4.42 A significant weight, 207g, of charcoal was also recovered from layer (8.0028) <8.0005>, which is recommended for radiocarbon dating (see below).

3.4.43 All the charcoal from <8.0001> <8.0003> and <8.0005> should therefore be fully analysed for Bronze Age fuel procurement practices.

Radiocarbon dating

No. of radiocarbon results achieved: 1

Table 38 Area 8 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554949	Hazel charcoal	sample <3> of fill (80018) of trough	3010±30BP	1386-1128 cal BC	Middle to Late Bronze Age

No. of further radiocarbon determinations recommended: 2

3.4.44 A single date from this site was achieved which helped to date the burnt mound.

3.4.45 Charcoal from both the burnt mound (8.0003) sample <8.0001> and from the sample <8.0005> from fill (8.0028) of pit [8.0005] would benefit from being radiocarbon dated. Both would aid in chronologically defining the burnt mounds on Anglesey.

Research

3.4.46 Confirmation of the date, nature, character and extent of potential prehistoric sites in an order that can be placed into the wider context of Anglesey during this period. There is particular emphasis on obtaining accurate Carbon-14 dates so that the

chronology of sites and ceramic sequences can be ascertained. Placing the setting of the information gained from the archaeological investigation into a broader regional and national (including Britain and Ireland) context. Identifying and understanding early field systems, their development and degree of continuity.

Area 12

Periods

Early Medieval

Site summary

3.4.47 Excavations recorded evidence of an Early medieval settlement. A penannular ditch, thought to date to the Late Bronze Age or Iron Age based on its form, could not be radiocarbon dated due to a lack of sampling. Samples from two associated pit fills were radiocarbon dated to the Early medieval period. One was located within the penannular ditch, the other cut into it. It is possible, therefore, that all features encountered relate to Early medieval occupation.

Stratigraphy

3.4.48 Full analysis of data from Area 12 should be utilised to consider issues discussed including what settlement or other forms of occupation might have existed and how they can be recognized. This will be particularly focused on the early Medieval period since the secure data relates to that era.

Artefacts

Table 39 Quantification of finds assemblages from Area 12

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Industrial Waste	Low	0	0	1 to 10	0.004	0	0		0.004	No	No	Sue Thompson (WA)	No	No
Lithics	Medium	3	0.016	0	0	0	0	3	0.016	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	Medium	1	0.283	0	0	0	0	1	0.283	Yes	Yes	Sue Thompson (WA)	No	No
Magnetically responsive	None				0.007				0.007	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.4.49 Two flints were recovered from three contexts during the investigation at Area 12; similarly to flints recovered from the other Wylfa sites, this warrants inclusion as part of the wider contextual and interpretative analysis. These artefacts, which are

potentially residual, could be illustrated and collectively presented with flints from other sites e.g. HS 16, Area 5, Area 16 and HS 5.

3.4.50 A stone object, likely comprising a rubber or a whetstone, was recovered from context (12041). Further work and illustration are warranted; comparative research with other domestic stone artefacts from across the Wylfa site complex would be beneficial e.g. with Areas 3 and 17 as well as HS 5.

3.4.51 No further work is recommended on the industrial waste (<4g).

Ecofacts

Total number of samples: 5 (13 tubs) 154 kg (88 l)

3.4.52 Charred plant remains (CPR) and charcoal were recovered from all five samples. The material (12030) <12002> from the secondary fill of a ditch terminus must be discounted, as it is likely to be a later deposit not relevant to the feature.

3.4.53 The remaining four samples relate to fills of the same pit [12047]: (12049) <12003>, (12041) <12004>, (12044) <12005> and (12046) <12006>. The pit has been convincingly radiocarbon dated to the medieval period. The CPR and charcoal from these four samples should, therefore, be submitted four full analysis. This will help inform on medieval crop and fuel practices in line with the regional research agenda.

Animal bone

3.4.54 Animal bone (1g) was hand-collected from (12044) and presented very poorly preserved fragments of limb bones from a small mammal. Sample <12005> from the same context yielded a further 2g of bone which presented poorly preserved elements from a bird and a rodent. No further work is required on this assemblage.

Radiocarbon dating

No. of radiocarbon results achieved: 4

Table 40 Area 12 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553549	Charred wheat grain	sample <12003> from fill (12049) of pit [12048]	1350±30BP	cal AD637-765	Early medieval
Beta-553550	Charred barley grain	sample <12006> from fill (12046) of pit [12047]	1320±30BP	cal AD652-768	Early medieval
SUERC-71153 (GU42753)*	Charred barley grain	sample <272> of fill (2133-005) of pit [2133-004]	1356±27BP	cal AD631-763	Early medieval
SUERC-71157 (GU42754)*	Charred barley grain	sample <273> of fill (2133-006) of pit [2133-004]	1392±29BP	cal AD604-670	Early medieval

*undertaken during evaluation stage

No. of further radiocarbon determinations recommended: 0

3.4.55 Two radiocarbon dates were undertaken during the assessment with a previous two taken during the evaluation in 2017. These were taken to aid in refining the phasing.

3.4.56 All of the environmental samples yielded enough material that would be suitable for radiocarbon dating. However, the majority of these were taken from pit [12047] and the most suitable deposits i.e. lowest in the sequence, have already been dated. The only sample not from this pit was taken from a secondary fill of a pit [12029]; a date from this would not be archaeologically informative.

3.4.57 The very small fragments of animal bone from this site would not be suitable for radiocarbon determination.

3.4.58 No further radiocarbon submissions are warranted.

Research

3.4.59 Why so little settlement evidence is seen for the early Medieval period and does this reflect 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 land use and determining if there are detectable regional variations.

Area 17

Periods

Late Mesolithic, Medieval

Site summary

3.4.60 Area 17 contained Palaeolithic to Mesolithic features of a large ditch and a burnt area, the latter having been radiocarbon dated to 6747-6796 calBC. One pit with burning evidence and pottery inclusions dating to the Late Bronze Age and Iron Age was also identified. Probable medieval rectilinear field systems represented by three ditches and a possible further two ditches in the area were also identified, while slightly later activity of re-cutting some of the features could also be identified. Three undated features were finally identified across the site, two being small circular features and one linear.

Stratigraphy

3.4.61 Full analysis of the environmental samples from excavation be undertaken as although so little was gathered at least one feature is of Late Mesolithic date and dating of a second discrete feature would be possible.

Artefacts

Table 41 Quantification of finds assemblages from Area 17

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray
Prehistoric Pottery	High	1	0.012			0	0.000	1	0.012	Yes	Yes	Sue Thompson (WA)	No	No
Fired Clay	Low	0	0.000	1 to 10	0.011	0	0.000		0.011	No	No	Sue Thompson (WA)	No	No
Worked stone	High	3	0.232			0	0.000	3	0.232	Yes	Yes	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	1	0.004			0	0.000	1	0.004	No	No	Sue Thompson (WA)	No	No
Heated Stone	None	0	0.000	1 to 10	0.035	0	0.000		0.035	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None				0.003				0.003	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.4.62 A single flint was recovered during the investigation at Area 17; similarly to flints recovered from the other Wylfa sites, this only warrants inclusion as a short sentence as part of the wider contextual and interpretative analysis. This artefact could be illustrated and collectively presented with flints from other sites e.g. HS 16, Area 5 and HS 5.

3.4.63 Two stone objects, comprising whetstones or grinding stones, warrant further analysis and illustration. This also includes comparative research with domestic stone artefacts found on other Wylfa sites. The grinding stones were recovered from context (17040) of burnt spread / refuse deposit [possible cut 17039]. A radiocarbon date from a sample of guelder rose (*Viburnum opulus*) charcoal from this fill produced a radiocarbon age of 7830±30 BP (Beta-553526) which produced a date with 95.4% probability of 6747-6596 calBC, placing it in the Late Mesolithic period. Some caution may need to be applied here; as per the assessment report (Hughes 2020, 16), the material could have been deposited naturally, which may mean that the deposit may not date to the same period as the feature. Comparative research with other stone artefacts potentially from this period in Wales and perhaps in the wider landscape will be pertinent.

3.4.64 Four fragments of prehistoric pottery were recovered and warrant further work and illustration (if they are diagnostic sherds). Prehistoric pottery is rare on archaeological

sites in Wales and full analysis is certainly recommended. They should be analysed and discussed in conjunction with other prehistoric pottery assemblages from the Wylfa complex, including Area 3, HS 7-9 and Area 15.

3.4.65 No further work is recommended on the finds recovered from environmental samples.

Ecofacts

Total number of samples 3 (11 tubs) 139 kg (85 l)

3.4.66 Charcoal was recovered from two samples (17009) <17001> and (17040) <17003>, the latter of which returned a Mesolithic date from radiocarbon submission. The excavation report suggested the pits were all backfilled with waste material.

3.4.67 The charcoal should be fully analysed to address Mesolithic wood and fuel procurement practices as (17009) has currently been dated through association although a radiocarbon submission is recommended to confirm this prior to the full analysis commencing.

Radiocarbon dating

No. of radiocarbon results achieved: 1

Table 42 Area 17 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-553526	Guelder rose charcoal	sample <17003> of fill (17040) from pit [17039]	7830±30BP	6747-6596 cal BC	Late Mesolithic

No. of further radiocarbon determinations recommended: 1

3.4.68 A single radiocarbon date was requested for this area as it was thought to be a refuse deposit rather than associated with a burnt mound and it was hoped that a date would aid in resolving this.

3.4.69 The only other sample to produce material suitable for radiocarbon dating is from <17001> fill (17009) of pit [17008] which contained prehistoric pottery. Radiocarbon should be undertaken to tighten the chronology of the pottery.

Research

3.4.70 Full analysis of data from Area 17 should be utilised to consider issues discussed as part of the written scheme of investigation (HNP 2015, 2016), including the dating,

characterisation and pattern of historic field systems and an examination of isolated discrete features, since there may be invisible Periods within the landscape, only detectable from such large scale projects as this. The need to further analyse the potential field systems on an expanded spatial scale. This will involve returning to historical mapping, combining other data sources and examining other examples from both similar and dissimilar topographic regions to test hypotheses of how various ditches may fit together, their relative functions, relationships to settlements or other activity foci and recreate the medieval field systems of Anglesey.

Area 18

Periods

Roman

Site summary

3.4.71 Area 18 contained a possible undated trackway, formed by a shallow cut and redeposited, unworked stones. It was aligned NW-SE, cutting across, rather than along, the valley bottom. It may have linked the Romano-British site recorded in Area 4 with that at Area 19 and possibly Area 20, but the possibility that it was constructed earlier or later than the Romano-British period cannot be ruled out.

Stratigraphy

3.4.72 Apart from including the contexts within the project GIS, no further stratigraphic analysis is recommended.

Artefacts

3.4.73 No artefacts were recovered from the site, therefore no further work is recommended.

Ecofacts

3.4.74 No samples taken. No ecofacts recovered. No further analysis is required.

Radiocarbon dating

No. of radiocarbon results achieved: 0

No. of further radiocarbon determinations recommended: 0

3.4.75 No material was present for radiocarbon dating.

Research

3.4.76 Combine the various datasets for the project already produced into a searchable database that can allow the information to be unified and interrogated in a rapid and meaningful manner.

3.4.77 The absence of a sampling strategy with regard to the trackway makes dating impossible at this time. An attempt to get an OSL date for the trackway could have been made. Should the opportunity to date this feature through scientific methods arise in the future, it should be taken. Tracing the course of such features in the landscape could potential help to locate settlement sites that have not been discovered through other methods.

Hotspot 5

Periods

Late Bronze Age, Iron Age, Post Medieval

Site summary

3.4.78 Hotspot 5 consisted of Late Bronze Age to Iron Age features. The site included two burnt mounds, with evidence of different phases of use, three troughs, a possible well and a pit. Two modern features of a drainage ditch and tree throw were identified also at Hotspot 5 and one unphased pit.

Stratigraphy

3.4.79 Due to the small number of datable features and archaeological material identified during the excavation of Hotspot 5, and the delay in radiocarbon dating, the information gained from the assessment is very limited. The excavation of Trench 315, identified as a Later Prehistoric bunt mound during the evaluation phase, revealed a large burnt mound, along with five associated troughs, pits and deposits, that were sealed by a colluvial layer with a later drainage ditch cut into it. Excavated in two slots running north to south and east to west, the bunt mound indicated four potential phases of deposition. All of the deposit and features associated with the burnt mound, i.e. 5 potential troughs [105.0012], [105.0042]; [105.0055], [105.0077] and

[105.0098], two pits [105.0091]; [105.0064], a burnt spread (105.0095) likely represents an accumulation of waste during the use of the burnt mound.

3.4.80 Evidence of prehistoric activity was not identified in secured contexts associated with features but was demonstrated by an unstratified worked lithic (SF001), a possible multi-platform core of Neolithic to Bronze Age date. In addition to the recovery of worked stone finds, SF002 and SF003, possible grinding stone fragments from trough [105.0012] and [105.0042], and a fragment of schist or slate with evidence of sooting from well [105.0071]. It is difficult to closely date the stone artefacts, however, similar artefacts have been recovered from prehistoric and Roman sites on Anglesey.

Artefacts

Table 43 Quantification of finds assemblages from Hotspot 5

Category	Significance	Bulk cnt	Bulk wgt	Enviro abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Industrial Waste	Low	0	0.000	11 to 50	0.018	0	0.000		0.018	No	No	Sue Thompson (WA)	No	No
Lithics	Medium	0	0.000	0	0.000	1	0.078	1	0.078	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked Stone	High	0	0.000	0	0.000	4	12.515	4	12.515	Yes	Yes	Sue Thompson (WA)	No	No
CBM	Low	0	0.000	1 to 10	1.770	0	0.000		1.770	No	Yes	Sue Thompson (WA)	No	No
Magnetically responsive	Low				0.057		0.000		0.057	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.4.81 A single flint, comprising a Neolithic multi-platform core, was recovered from HS 5. Similarly to the flints recovered from other sites in the Wylfa complex, this only warrants inclusion as a short sentence as part of the wider contextual and interpretative analysis. This artefact could be illustrated and collectively presented with flints from other sites e.g. HS 16, Area 5 and Area 17.

3.4.82 Three stone artefacts, including a grinding stone and two hollowed stones, warrant further analysis and illustration.

3.4.83 No further work is recommended on the heat-affected stone, the natural sandstone cobble (SF 6) or industrial waste.

Ecofacts

3.4.84 Total number of samples 47 (141 tubs) 1554kg (986 l)

3.4.85 Charcoal was present in forty-two of the forty-seven samples presented for processing, while eight yielded charred pant remains (CPR).

3.4.86 The charred plant remains are in such small quantities that no further analysis is required.

3.4.87 The wood from (105.0070) is from a peat and wood layer but was designated as part of backfilling and not of archaeological significance.

3.4.88 With only one radiocarbon submission sent from trough [105.0042] which returned a date expected for the site. It is recommended that the charcoal from this sample, which yielded over 100g, is fully analysed as detailed in Huntley (2010). Seven other contexts should also be fully analysed due to high yields from areas of burnt spreads and troughs, these are contexts: (105.0043) <105.0026>, (105.0078) <105.0033>, (105.0059) <105.0032>, (105.0056) <105.0038>, (105.0096) <105.0047>, (105.0052) <105.0048> and (105.0058) <105.0049>. These can be dated through association with the dated trough although further dates may be considered prior to analysis if possible. These features will give an insight into Bronze Age fuel procurement practices.

3.4.89 Tree throw (105.0031) <105.0011>, which yielded over 50g of charcoal, should also be analysed and dated due to tree spills having potential to inform on the prehistoric environment and exploitation. These features must first be dated through absolute or typological means but offer potential to give good insight into fuel procurement.

3.4.90 Charcoal from 8 samples are recommended for further analysis for fuel procurement practices.

Radiocarbon dating

No. of radiocarbon results achieved: 1

Table 44 Hotspot 5 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554154	Rose charcoal	sample <43> from fill (105.0088) of pit [105.0042]	2700±30BP	905-806 cal BC	Late Bronze Age
FAILED		<44> (105.0089)			

No. of further radiocarbon determinations recommended: 3

3.4.91 The majority of the available suitable charcoal (n=21 samples yielded sufficient quantities of charcoal) originates from features associated with the burnt mound. This

burnt mound is thought to have 4 different phases of use. It would be useful to discern between these different stages; it is recommended that the following are dated:

- <105.0048> (105.0052) lower fill of trough;
- <105.0026> (105.0043) upper fill of trough; and
- <105.0015> (105.0046) mid deposit of mound.

Research

Q.3. What is the functional and stratigraphic relationship between the burnt mounds/spreads and other spatially associated features in particular reference to possible structural features (post holes) and ditch type features ('troughs')?

Q.4. What relationships or patterns, if any, can been seen between these prehistoric features and their wider landscape setting?

Q.5. What evidence do the ditch features provide for prehistoric landscape organisation and enclosure?

Q.6. What is the relationship between the ditches and other prehistoric features such as settlement features and burnt mounds/spreads?

Q.7. What relationships or patterns, if any, can been seen between these potential prehistoric features and their wider landscape setting?

Q.8. What types of artefacts are present in the SMS zones?

Q.9. What can these artefacts tell us about daily life and ritual activity?

Q.10. Were those artefacts, which may be found in the SMS Zones, produced locally? Post-medieval.

Q.11. What can the ditches and land drains tell us about the process of enclosure and land improvement in the post-medieval to the modern periods in the SMS zones?

Q.12. What evidence is there for the types of farming and land use in this area in the post-medieval and modern periods in the SMS zones?

Q.13. What can artefacts indicative of the material culture of the medieval, post-medieval and modern periods, in these zones, tell us about the connections between this area and the wider world through trade and consumption?

Hotspot 6

Periods

Prehistoric, Medieval

Site summary

3.4.92 Hotspot 6 contained a pit and colluvial layer, both radiocarbon dated to the Neolithic to Early bronze Age periods. The pit dating to 3637-3508 BC and the colluvial layer

dating to 2290-2131 BC. A linear trackway was also identified and believed to be the same as found at Hotspot 7-9.

Stratigraphy

3.4.93 The excavation of Hotspot 6, initially identified as a burnt mound during evaluation, consisted of a series of colluvial deposits which contained stone and charcoal. The presence of charred Hazelnut shells in these deposits and a spot dated Prehistoric pit nearby suggest the potential for early activity in the area which is a priority in the identified research framework objectives outlined in documents discussed in section 2.6 of this document. Of particular note, the strip, map and sample at Hotspot 6 highlighted the presence of a trackway, and similar to the colluvial deposits identified in the south eastern corner of the trench, was observed to be chronologically earlier than the squared enclosure. This trackway traversed the site parallel to an area of what is currently low-lying wetland to the south, and the utilisation of this trackway is a key consideration when Hotspot 6 is placed within a wider archaeological landscape. With the present data recovered from excavation of Hotspot 6, the remains of the squared enclosure may relate to the later Prehistoric period but could equally be of a later date. Determining a definite chronology for archaeological remains recorded at Hotspot 16 from the feature typology, lack of stratified finds, and scarcity of suitable samples for radiocarbon dating is problematic.

Artefacts

Table 45 Quantification of finds assemblages from Hotspot 6

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro abundance	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Lithics	Medium	0	0	1 to 10	0	3	0.024	3	0.027	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Iron	Medium	0	0	0	0	1	0.038	1	0.038	Yes	Yes	Sue Thompson (WA)	Yes	Yes
Magnetically responsive	Low				0					No	No	Freddie Lowrie-Sisson (WA)	No	No

3.4.94 Three flints were recovered from HS 6. Further analysis is recommended; the flints will benefit from being considered alongside other areas with the wider project – e.g. a wider landscape study. Illustration is recommended.

3.4.95 No further work is recommended on the possible iron knife blade recovered from the topsoil.

Ecofacts

Total number of samples 12 (31 tubs) 338 kg (244 l)

3.4.96 Charred plant remains (CPR) were present in two samples and charcoal in six of the twelve samples presented for processing from Hotspot 6.

3.4.97 The charcoal is in such small quantities that is unlikely to give any specific insight into the medieval fuel procurement and other sites either at Wylfa or in the wider Welsh landscape will better inform on these past practices.

3.4.98 The CPR was present in two samples both from enclosure gullies and in quantities of 47 from gully fill (106.0004) and 23 from gully terminus fill (106.0011). Although not the largest assemblages they may help inform on changes in land use between the early medieval and medieval periods, as stated in the research framework for the archaeology of Wales, when put into a wider landscape context. Therefore, the CPR should be taken through a full analysis for species and sub-species where possible.

Animal bone

3.4.99 Animal bone was present within the retent from two samples, <1> and <7> and weighed less than 1g. Neither would be suitable for analytical work.

3.4.100 Only the CPR is recommended for analysis to address crop husbandry practices during the medieval to late medieval conversion period.

Radiocarbon dating

No. of radiocarbon results achieved: 4

Table 46 Hotspot 6 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554171	Rose charcoal	sample <9> from fill (106.0033) of pit [106.0034]	4750±30BP	3637-3382 cal BC	Early Neolithic
Beta-554172	Rose charcoal	sample <11> from colluvial layer (106.0037)	3770±30BP	2290-2051 cal BC	Early Bronze Age
Beta-554173	Willow/poplar charcoal	sample <7> of fill (106.0011) of gully	960±30BP	1020-1155 cal BC	Late Bronze Age
Beta-554174	Charred oat grain	sample <1> from fill (106.0004) of gully	950±30BP	cal AD1024-1155	medieval

No. of further radiocarbon determinations recommended: 0

3.4.101 Four radiocarbon dates were returned for this site and were chosen to aid in phasing the site.

No suitable material remains for submission of more determinations.

Research

Prehistoric

Q.4. What relationships or patterns, if any, can been seen between these prehistoric features and their wider landscape setting?

Q.5. What evidence do the ditch features provide for prehistoric landscape organisation and enclosure?

Q.8. What types of artefacts are present in the SMS zones?

Q.9. What can these artefacts tell us about daily life and ritual activity?

Q.10. Were those artefacts, which may be found in the SMS Zones, produced locally?

Post-Medieval

Q.11. What can the ditches and land drains tell us about the process of enclosure and land improvement in the post-medieval to the modern periods in the SMS zones?

Q.12. What evidence is there for the types of farming and land use in this area in the post-medieval and modern periods in the SMS zones?

Q.13. What can artefacts indicative of the material culture of the medieval, post-medieval and modern periods, in these zones, tell us about the connections between this area and the wider world through trade and consumption?

Hotspot 7/9

Periods

Prehistoric, Post Medieval

Site summary

3.4.102 Hotspot 7-9 contained prehistoric features: three intercutting pits and 35 stake holes, one having a fill radiocarbon dated to 2031-1887 BC (Neolithic to Early Bronze Age). The Late Bronze Age to Early Iron Age period consisted of a pit and a burnt mound with associated trough. Late Iron Age to Roman features at the site included a spread of stone demolition material, a stone well and two pits connected by a shallow gully. A fill of one of the pits was radiocarbon dated to 106 BC – 58 AD. These features are likely connected to Romano-British features at Hotspot 15. Later phasing features consist of a gully that has evidence of re-cutting, three ditches and one pit. Modern evidence consisted of three field drains.

Stratigraphy

3.4.103 The first phase is associated with ancient natural processes, i.e. the tree throw and alluvial deposits of dark brown peak and clay overlaying early, potentially industrial, activity. Mid phase activity is associated with the two ditches, oriented northeast to southwest, and located within the north east corner of the first extension area. The function of the features is unknown and the recovery of a piece of worked flint (SF026) suggest a Mesolithic to Neolithic date. Late phase activity was identified via a linear gulley, ditch and pit of unknown function. Followed by modern field drain systems build to improve drainage. Due to these later activities and ploughing during more recent time, several excavated features could not be phased. The trackway is likely to be associated with activity relating to one of the identified feature groups but as no datable artefacts were recovered during its excavation, and no physical relationships were identified, this cannot be determined without radiocarbon dating. It is likely that the trackway was used to traverse the edge of the wetland to the south.

Artefacts

Table 47 Quantification of finds assemblages from Hotspot 7/9

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Prehistoric Pottery	High	0	0.000	0	0.000	1	0.003	1	0.003	Yes	Yes	Sue Thompson (WA)	No	No
Lithics	High	0	0.000	1 to 10	0.003	18	0.265	18	0.268	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	High	0	0.000	1 to 10	0.831	4	1.215	4	2.046	Yes	Yes	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	0	0.000	0	0.000	1	0.001	1	0.001	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	Low				0.349				0.349	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.4.104 Further analysis is recommended on the Bronze Age pottery (n = 1), including comparative research and illustration (if a diagnostic sherd). Prehistoric pottery is fairly rare on archaeological sites in Wales and full analysis is certainly recommended. It should be analysed in conjunction with the prehistoric pottery recovered from the other Wylfa sites which would provide a fuller interpretation discussion.

3.4.105 The 21 late Mesolithic to Neolithic flints recovered from HS 7-9 warrant further analysis; this would include illustration of at least 15 artefacts and comparative research. The assemblage should also be discussed in relation to other flint assemblages across the Wylfa complex, forming a wider prehistoric landscape.

3.4.106 Further analysis is also recommended on two stone artefacts which include a spindle whorl and a quern, including comparative research and illustration. Spindle whorl could be discussed with other similar domestic artefacts e.g. from Area 8 and HS 8.

3.4.107 Further analysis of these finds would contribute towards several archaeological research frameworks, including settlement sites and settlement patterns as well as artefact scatters.

Ecofacts

Total number of samples: 88 (265 tubs) 2779 kg (1776 l)

3.4.108 Charred plant remains (CPR) were present in five of the eighty-eight samples, charcoal in sixty-nine.

3.4.109 The CPR were observed in small quantities for the most part, with the exception of ditch fill (109.0003) <1> and pit fill (109.0005) <2>. These had assemblages of 21 and 50 examples respectively. Due to the small quantities, and the certainty that these were not in their place of primary deposition, no further work is warranted on the CPR assemblage.

3.4.110 The charcoal from dated features, burnt mounds and associated pits, should be given full analysis. These are from burnt mound fill (109.0154) <60> <61> <62> and <63> and its associated pits (109.0168) <67>, (109.0169) <68> and (109.0170) <71>. Of these, samples <68> and <71> were radiocarbon dated and returned a Bronze Age date. The charcoal analysis has the potential to add insights to Bronze Age fuel procurement strategies.

3.4.111 A well [109.0214] is discussed in the archaeological report but is not recorded as such in the context register, the cut number and associated contexts have been checked but yielded no ecofactual material.

Animal bone

3.4.112 Animal bone was hand-collected during the excavation yielding SF001 and SF010. It was also present within four samples; <2>, <24>, <25> and <54>. All were present as either unidentifiable bone fragments or tooth fragments and represented

medium to large-sized ungulates. No further analytical work can be undertaken on these.

Radiocarbon dating

No. of radiocarbon results achieved: 4

Table 48 Hotspot 7/9 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554167	Oak charcoal	sample <15> of fill (109.0044) from stakehole [109.0045]	3600±30BP	2031-1887 cal BC	Early Bronze Age
Beta-554168	Rose charcoal	sample <68> in fill (109.0169) of pit [109.0171]	2880±30BP	1192-939 cal BC	Late Bronze Age
Beta-554169	Rose charcoal	sample <71> of base (109.0170) from pit [109.0171]	2930±30BP	1219-1026 cal BC	Late Bronze Age
Beta-554170	Charred barley grain	sample <87> taken from fill (109.0222) of stone-lined pit [109.0204]	2020±30BP	cal 106BC-AD58	Roman

No. of further radiocarbon determinations recommended: 1

Four radiocarbon dates were requested for this site to aid in phasing.

3.4.113 A currently un-phased ditch to the south of the site may benefit from being dated. However, the ditch has four fills and only the secondary and the upper fill were sampled. Both contain small quantities of charcoal. The secondary fill (109.0182) <74> would, if dated, provide a *Terminus ante quem* (TAQ) to narrow down the phasing for the construction of the ditch. It would be essential that a short-lived species is selected; if only oak is present then a radiocarbon date should not be sought.

3.4.114 Whilst another date for the stakehole group may narrow down the date, there is not enough material for this to be supported.

Research

Prehistoric;

Q.2. Are the burnt mounds/spreads the by-product of a specific function and what is that function?

Q.3. What is the functional and stratigraphic relationship between the burnt mounds/spreads and other spatially associated features in particular reference to possible structural features (post holes) and ditch type features ('troughs')?

Q.4. What relationships or patterns, if any, can been seen between these prehistoric features and their wider landscape setting?

Q.5. What evidence do the ditch features provide for prehistoric landscape organisation and enclosure?

Q.6. What is the relationship between the ditches and other prehistoric features such as settlement features and burnt mounds/spreads?

Q.8. What types of artefacts are present in the SMS zones?

Q.9. What can these artefacts tell us about daily life and ritual activity?

Q.10. Were those artefacts, which may be found in the SMS Zones, produced locally?

Post-Medieval;

Q.11. What can the ditches and land drains tell us about the process of enclosure and land improvement in the post-medieval to the modern periods in the SMS zones?

Q.12. What evidence is there for the types of farming and land use in this area in the post-medieval and modern periods in the SMS zones?

Q.13. What can artefacts indicative of the material culture of the medieval, post-medieval and modern periods, in these zones, tell us about the connections between this area and the wider world through trade and consumption?

Hotspot 8

Periods

Neolithic, Iron Age, Post-medieval

Site summary

3.4.115 Excavations revealed Neolithic ditches, an Iron Age rectangular structure interpreted as a possible grain stores (by comparison with similar features recorded at Cefn Du Gaerwen). Features exposed were 12 pits, two post holes located at the termini of one of the ditches, two ditches and a stone platform. Modern field clearance cairns and three tree-throws were also identified.

Stratigraphy

3.4.116 A number of features comprising 14 pits which may have accommodated posts, two post-holes, two ditches and a stone platform were identified and excavated during the course of the excavations at Hotspot 8. The earliest features at the site are likely to be the ditches, although only the eastern ditch was cut by later activity. The later activity consisted of the erection of a rectangular structure as evidenced by the surviving pits which may have accommodated posts. The function of this building is unclear at present, but the arrangement of the posts would be consistent with other structures, such as those at Cefn Du, Gaerwen (Cuttler et al, 2012), which have been interpreted as grain stores.

3.4.117 The recovery of a fragment of probable furnace lining from the fill of the eastern ditch would indicate local industrial activity, although the retrieval of a spindle whorl from the topsoil may suggest a more domestic setting in the vicinity of the site. Determining a definite chronology for archaeological remains recorded at Hotspot 8 from the feature typology, lack of stratified finds, and scarcity of suitable samples for radiocarbon dating is problematic.

Artefacts

Table 49 Quantification of finds assemblages for Hotspot 8

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Fired Clay	Low	0	0.000	1 to 10	0.022	1	0.020	1	0.042	Yes	No	Sue Thompson (WA)	No	No
Industrial Waste	Low	0	0.000	11 to 50	0.170	0	0.000		0.170	Yes	No	Sue Thompson (WA)	No	No
Worked stone	High	0	0.000	0	0.000	1	0.031	1	0.031	Yes	Yes	Sue Thompson (WA)	No	No
Magnetically responsive	Low				0.005				0.005	No	No	Freddie-Lowrie Sisson (WA)	No	No

3.4.118 Further analysis is recommended on a red sandstone spindle whorl recovered from the topsoil, to include comparative research and illustration. It should perhaps be analysed as a part of a larger overarching study alongside any other loom weights and spindle whorls from other Wylfa sites, forming a wider prehistoric landscape study e.g. with Area 8.

3.4.119 No further analysis is recommended on the fired clay fragments and industrial waste.

Ecofacts

Total number of samples 18 (30 tubs) 302 kg (233 l)

3.4.120 Charcoal was the only ecofactual material recovered from the samples. Six samples yielded over 5g of charcoal which were:

- Samples <5> from fill (108.0015) and <6> from fill (108.0025) both out of pit [108.0016];
- Samples <7> from fill (108.0019) and <8> from fill (118.0026) both out of pit [108.0020];
- Sample <11> from fill (108.0031) out of posthole [118.0030];
- Sample <13> from fill (108.0028) out of pit [118.0029]; and
- Sample <15> from fill (108.0023) out of pit [118.0024].

3.4.121 The radiocarbon date from sample <18> returned a Neolithic and sample <19> returned an Iron Age date showing a potential long term use of the area so further analysis of the charcoal would be useful in an intra-scheme analysis as well as site-focused.

3.4.122 It is recommended that the above deposits are submitted for radiocarbon dates to assess what period the fill of the pits are from and therefore inform on the fuel procurement practices of that period.

Radiocarbon dating

No. of radiocarbon results achieved: 2

Table 50 Hotspot 8 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554175	Indeterminate charcoalified twig	sample <18> from fill (108.0049) of ditch [108.0050]	5150±30BP	4040-3811 cal BC	Late Mesolithic to Early Neolithic
Beta-554177	Willow/poplar charcoal	sample <19> of fill (108.0052) from pit [108.0053	2200±30BP	366-186 cal BC	Early to Middle Iron Age
FAILED		sample <17> of fill (108.0032) of pit [108.0033]			

No. of further radiocarbon determinations recommended: 2

3.4.123 Three dates for this area were requested during the assessment to aid in phasing, however, one failed due to insufficient carbon.

3.4.124 Charcoal from posthole [108.0030] <11> is thought to be associated with the ditch. A date from this may be used for this purpose if this association can be proved. All the samples that have yielded quantities of charcoal that may be suitable for dating are located within the pit cluster.

3.4.125 A further two radiocarbon dates are recommended to improve our understanding of the pit cluster.

Research

Prehistoric

Q.1. Are the possible structural features associated with isolated structures or part of a larger settlement?

Q.4. What relationships or patterns, if any, can been seen between these prehistoric features and their wider landscape setting?

Q.5. What evidence do the ditch features provide for prehistoric landscape organisation and enclosure?

Q.7. What relationships or patterns, if any, can been seen between these potential prehistoric features and their wider landscape setting?

Q.8. What types of artefacts are present in the SMS zones?

Q.9. What can these artefacts tell us about daily life and ritual activity?

Q.10. Were those artefacts, which may be found in the SMS Zones, produced locally?

Post-Medieval

Q.11. What can the ditches and land drains tell us about the process of enclosure and land improvement in the post-medieval to the modern periods in the SMS zones?

Q.12. What evidence is there for the types of farming and land use in this area in the post-medieval and modern periods in the SMS zones?

Hotspot 16

Periods

Late Iron Age/Romano-British, Post Medieval

Site summary

3.4.126 Excavation revealed three pits and a ditch terminus, thought to represent evidence of settlement activity. Samples from the fills of the features returned dates in the Late Iron Age to Early Roman period. One Post-medieval pit was also identified.

Stratigraphy

3.4.127 The excavation and assessment have revealed a site which has archaeological potential that requires further analysis to properly understand the archaeological features identified and how they relate to their wider setting. Upon excavation six pits and a ditch were investigated, one pit contained Post-Medieval pottery sherds (SF003), suggesting a post-medieval date for the features, including the ditch which truncated two pits. A pit containing fragments of wood (SF002) and (SF004) could not be dated during the excavation. Evidence of prehistoric activity was not identified in secured contexts associated with features but was demonstrated by unstratified worked lithic finds consisting of a polished stone axe (SF001), lithic fragments and stone finds, likely dating to the Neolithic. However, determining a definite chronology for archaeological remains recorded at Hotspot 16 from the feature typology, lack of stratified finds, and scarcity of suitable samples for radiocarbon dating is problematic.

Artefacts

Table 51 Quantification of finds assemblages from Hotspot 16

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Lithics	Medium	2	0.778	0	0.000	0	0.000	2	0.778	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Worked stone	Medium	0	0.000	0	0.000	1	0.037	1	0.037	Yes	Yes	Sue Thompson (WA)	No	No
Post-medieval pottery	Low	0	0.000	0	0.000	6	0.158	6	0.158	No	No	Sue Thompson (WA)	No	No
Wood	Low	0	0.000	0	0.000	10	0.601	10	0.601	No	No	Freddie Lowrie-Sisson (WA)	No	No
Magnetically responsive	None				0.010				0.010	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.4.128 Two unstratified flints were recovered; these only warrant inclusion as a short sentence as part of the wider contextual and interpretative analysis.

3.4.129 No further analysis is recommended on the other artefacts.

Ecofacts

Total number of samples: 7 (28 tubs) 289 kg (203 l)

3.4.130 Charcoal was present in four samples, but all assemblages weighed less than 1g. Charred plant remains were present in 3 samples, but with no assemblage larger than 5 examples. All of the samples were organic or top fills and the material is therefore of natural deposition and not relevant to human agency at the site.

3.4.131 No further analytical work is recommended.

Radiocarbon dating

No. of radiocarbon results achieved: 3

Table 52 Hotspot 16 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554180	Charred barley grain	sample <1> from fill (116.0003) of pit	2000±30BP	cal 84BC-AD70	Late Iron Age to Roman
Beta-554181	Charred barley grain	sample <3> from fill (116.0002) of pit	2000±30BP	cal 84BC-AD70	Late Iron Age to Roman
Beta-554182	Indeterminate charcoalified twig	sample <5> from fill of pit [116.0016]	2050±30BP	cal 166BC-AD20	Late Iron Age

No. of further radiocarbon determinations recommended: 0

3.4.132 Three radiocarbon dates have been returned to aid in phasing this site.

3.4.133 The dearth of decent sized charcoal assemblages or charred plant material quantities prohibits further radiocarbon determinations being made.

Research

Lithics

- Recording in detail the typological, technological and metrical traits of the assemblages, as well as the raw materials, condition and degrees of recortication.

- Discussing how the material compares and contrasts to other lithic and stone assemblages from the region and the implications that this may have for broader settlement strategies and patterns of landscape exploitation. Wood:

- Species identification of SF004.

Prehistoric

Q.4. What relationships or patterns, if any, can been seen between these prehistoric features and their wider landscape setting?

Q.8. What types of artefacts are present in the SMS zones?

Q.9. What can these artefacts tell us about daily life and ritual activity?

Q.10. Were those artefacts, which may be found in the SMS Zones, produced locally?

Post-Medieval

Q.11. What can the ditches and land drains tell us about the process of enclosure and land improvement in the post-medieval to the modern periods in the SMS zones?

Q.12. What evidence is there for the types of farming and land use in this area in the post-medieval and modern periods in the SMS zones?

Q.13. What can artefacts indicative of the material culture of the medieval, post-medieval and modern periods, in these zones, tell us about the connections between this area and the wider world through trade and consumption?

3.5 The four Class 4 sites (of low archaeological significance)

Area 11

Periods

Late Iron Age, Roman

Site summary

3.5.1 Excavation revealed discrete pit/post hole features indicative of low-density settlement. A single radiocarbon sample retuned a date in the Late Iron Age/Roman period.

Stratigraphy

3.5.2 Excavation results should be incorporated along with the results of wider Wylfa Newydd scheme and the results disseminated to interested parties and the public.

Artefacts

Table 53 Quantification of finds assemblages from Area 11

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray
Industrial Waste	Low	0	0.000	1 to 10	0.005	0	0.000		0.005	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None				0.005				0.005	No	No	Freddie Lowrie-Sisson (WA)	No	No

No further work is recommended.

Ecofacts

Total number of samples: 4 (4 tubs) 44kg (23 l)

3.5.3 Only one of the four samples yielded ecofactual material: <11003>. Charcoal and charred plant remains (CPR) were observed. The 5g of charcoal and 5 CPR are in a fill which yielded industrial waste. This is likely to be a waste deposit not related to the feature itself. No further work is recommended.

3.5.4 Animal bone was hand-collected (2g). It was calcined, in very poor condition, and was un-identifiable as elements or species. No further work is possible on the animal bone.

3.5.5 No further work is recommended on the environmental material.

Radiocarbon dating

No. of radiocarbon results achieved: 1

Table 54 Area 11 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554925	Ivy charcoal	sample <11003> from fill (11035) of spread [11304]	2030±30BP	cal 155BC-AD52	Late Iron Age

No. of further radiocarbon determinations recommended: 0

3.5.6 A single radiocarbon date was undertaken for this site. This was done to aid in refining the phasing.

3.5.7 No further charred plant material or charcoal were observed from the other samples that would be suitable for radiocarbon determination. The calcined animal bone (2g)

from fill (11025) of pit [11024] is not of sufficient weight or robusticity to be suitable for submission, therefore, no further radiocarbon recommendations have been made.

Research

3.5.8 There is a need to fully integrate the evaluation and excavation results to maximise the data for interpretation and check hypotheses. There is a need to confirm the presence of industrial waste as this remains unverified.

Area 13

Periods

Neolithic, Early Bronze Age

Site summary

3.5.9 Area 13 contained a burnt mound and two natural hollows dating to the Neolithic and Early Bronze Age periods.

Stratigraphy

3.5.10 Archaeological evidence was identified continuing beyond the previous evaluation trial trench (TR2282), which had encountered the possible remains of a burnt mound deposit. The archaeological evidence revealed during the excavation phase was concentrated in the northern half of the site, and comprised deposits revealed within the exposed natural geology. The location, away from any obvious fresh water source, suggests that any burning activity did not derive from a typical burnt mound, but could represent atypical use, such as salt panning. It is also possible that these deposits represented rubbish deposition relating to outlying settlement activity. The data recovered indicates that the use of these hollows in Area 13 is likely to have occurred in the Bronze Age.

Artefacts

Table 55 Quantification of finds assemblages from Area 13

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray
Fired Clay	Low	0	0.000	1 to 10	0.018	0	0.000		0.018	No	No	Sue Thompson (WA)	No	No
Lithics	Medium	0	0.000	1 to 10	0.003	0	0.000		0.003	Yes	Yes	Sue Thompson (WA)	No	No
Worked stone	Medium	6	5.190	1 to 10	0.013	0	0.000	6	5.203	Yes	Yes	Sue Thompson (WA)	No	No
Heated Stone	Low	0	0.000	1 to 10	0.035	0	0.000		0.035	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None				0.001				0.001	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.5.11 Further analysis, including comparative research and illustration, is warranted on five out of six worked stone objects; comparative research with other domestic stone artefacts from across the Wylfa site complex would be beneficial e.g. with Areas 3, 12 and 17 as well as HS 5.

3.5.12 A single flint, weighing 3g, was recovered from <13003> (13009). As with the flake recovered from Area 5, this only warrants inclusion as a short sentence as part of the wider contextual and interpretative analysis.

Ecofacts

3.5.13 Total number of samples 3 (12 tubs) 135kg (68 l)

3.5.14 Charcoal was the only ecofactual material present in all three of the samples presented for processing from Area 13.

- Sample <13001> from fill (13005) was from the secondary fill of a natural hollow [13004];
- Sample <13002> from fill (13007) out of burnt mound in hollow [13006]; and
- Sample <13003> from fill (13009) our of burnt mound in hollow [13008].

3.5.15 The contexts were from the same layer, (13009=13007), which (13009) returned a radiocarbon age which confirmed the Bronze Age date for the feature. It is recommended that the charcoal from this burnt mound/spread undergoes a full analysis as detailed in Huntley (2010). Combined they present over 100g of charcoal and would allow a reasonable insight into informing Bronze Age fuel practices across the Wylfa scheme and the wider Welsh Bronze Age landscape.

3.5.16 Burnt mound charcoal from samples <13002> and <13003> only is recommended for further analysis for fuel procurement practices.

Radiocarbon dating

No. of radiocarbon results achieved: 1

Table 56 Area 13 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554953	Willow/poplar charcoal	sample <13003> from fill (13009) of natural feature [13008]	3760±30BP	2287-2043cal BC	Early Bronze Age

No. of further radiocarbon determinations recommended: 0

3.5.17 A single radiocarbon date was undertaken for this area due to the paucity of features. The sampled deposit is related to another from the same feature and, thus, that sample would not require dating. The only other suitable quantities of charcoal were from a feature to the north-east but due to the unreliability of the provenance of the charcoal this was deemed unsuitable for radiocarbon. Therefore, no other radiocarbon dates are recommended from this site.

Research

3.5.18 The significance of the archaeology recorded in Area 13 (Field L1e) is minimal. The deposits encountered are indicative of historic land-use and could achieve research framework aims if the ecofactual material is analysed alongside other evidence retrieved from the wider project. The burnt deposits warrant further analysis as they retain the potential to provide further information about fuel usage and husbandry across Anglesey and the wider North West Wales landscape.

Area 16

Periods

Mesolithic, Medieval

Site summary

3.5.19 Area 16 contained a handful of discrete features and eight ditches. One pit, located close to a palaeochannel, contained 2 lithic artefacts thought to date to the Late Mesolithic/Early Neolithic. A total lack of recovered artefacts, and the absence of environmental sampling, means that nothing can be said about the date of the ditches.

Stratigraphy

3.5.20 Attempt should be made to date the isolated, potentially Mesolithic, pit. Similar pits have been dated elsewhere on the site and may start to reveal a pattern of Mesolithic activity on the Wylfa Newydd site that is currently largely absent.

Artefacts

Table 57 Quantification of finds assemblages from Area 16

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Fired Clay	Low	0	0.000	11 to 50	0.018	0	0.000		0.018	No	No	Sue Thompson (WA)	No	No

Lithics	Medium	2	0.003	0	0.000	0	0.000	2	0.003	Yes	Yes	Dr Miguel Gonzalez (Freelance)	No	No
Magnetically responsive	None				0.001				0.001	No	No	Freddie Lowrie-Sisson (WA)	No	No

3.5.21 Two flints of Late Mesolithic to Early Neolithic date were recovered from context (16009) of pit [16008] during the investigation at Area 16; similarly to flints recovered from the other Wylfa sites, this only warrants inclusion as part of the wider contextual and interpretative analysis. This artefact could be illustrated and collectively presented with flints from other sites e.g. HS 16, Area 5 and HS 5.

Ecofacts

Total number of samples 1 (4 tubs) 42 kg (25 l)

3.5.22 The single sample <16001> from fill (16009) out of pit [16008] yielded 10g of charcoal and has been phased as an isolated Mesolithic pit. It is recommended a radiocarbon date be submitted to establish the date of the pit and only then can its wider landscape importance be established and a full analysis of the charcoal is undertaken to examine past woodlands on Mesolithic Anglesey.

Radiocarbon dating

No. of radiocarbon results achieved: 0

No. of further radiocarbon determinations recommended: 1

No radiocarbon dating was undertaken during assessment.

3.5.23 The only feature that was sampled was a possible early prehistoric pit. This contained charcoal as well as stone tools that typologically dated the pit. The charcoal should be examined for the shortest-lived species and submitted for radiocarbon determination in order to place this act of human agency within the wider Wylfa landscape.

3.5.24 It is recommended that a single submission from the sample from this site is undertaken.

Research

3.5.25 Dating, characterisation and pattern of historic field systems is identified as a specific research aim in the WSI (HNP 2015, 2016) and full analysis of the environmental evidence from the rectilinear field system may assist with providing a date and remains for the remains which would help in understanding the development and degree of continuity of land divisions in Anglesey.

Hotspot 10

Periods

Undated

Site summary

3.5.26 Hotspot 10 consisted of a Neolithic to Late Bronze Age dated pit, four unphased ditches, two being parallel and a Post Medieval stone filled drain.

Stratigraphy

3.5.27 The evaluation identified a possible double ringed barrow in Trench 938 within field A4. Bulk samples taken from two features during the evaluation phase returned Radiocarbon dates indicative of the Romano British period. During excavation, a Post-Medieval stone field drain was revealed as well as a small undated pit and four undated ditches. No material evidence was obtained during the mitigation phase. The archaeology excavated does very little to support the Romano-British radiocarbon date from two features investigated during the evaluation; as no material evidence was found and the features excavated were not necessarily indicative of the Romano-British period.

Artefacts

Table 58 Quantification of finds assemblages from Hotspot 10

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-ray
Industrial Waste	None	0	0.000	11 to 50	0.083	0	0.000		0.083	No	No	Sue Thompson (WA)	No	No
CBM	None	0	0.000	11 to 50	0.001	0	0.000		0.001	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	None				0.013				0.013	No	No	Freddie-Lowrie Sisson (WA)	No	No

3.5.28 No further work is recommended on the artefacts from HS 10.

Ecofacts

Total number of samples: 7 (22 tubs) 248 kg (147 l)

3.5.29 Charcoal was the only ecofactual material recovered and was observed in six of the seven samples received for processing. The samples relate to pit and ditch fills.

3.5.30 The charcoal was recovered in small quantities, <1g from 2 ditches and 4g from two pit fills, and the fills designated as later backfill (not of archaeological significance). No further work is recommended.

Radiocarbon dating

No. of radiocarbon results achieved: 1

Table 59 Hotspot 10 radiocarbon dates

Lab number	Dated material	Sample information	Radiocarbon age	2-sigma range	Cultural period
Beta-554948	willow/poplar charcoal	sample <3> from lower fill (110.018) of pit [110.017]	3860±30BP	2461-2254 cal BC	Late Neolithic

No. of further radiocarbon determinations recommended: 0

3.5.31 A single radiocarbon date was achieved during the assessment to aid in phasing of this site.

3.5.32 The only other sample that yielded possibly enough quantities of suitable material was from the upper fill of the same pit. No further radiocarbon dates from this site are recommended based on the small quantity of charcoal and that the purpose of the pit was unknown.

Research

3.5.33 Comparative research may be required to investigate how the features identified at Hotspot 10 compare and contrast to other sites from the region, and the implications that this may have for broader settlement strategies and patterns of landscape exploitation.

3.6 The two Class 5 sites (not archaeologically significant)

Hotspot 12

Periods

Post Medieval

Site summary

3.6.1 Area 12 consists of three features; a pit of Post Medieval date, an outcrop of natural schist with signs of tool marks and a sub-circular feature. The sub-circular feature is more than likely to be a tree throw and not archaeological.

Stratigraphy

3.6.2 No further work suggested

Artefacts

Table 60 Quantification of finds assemblages from Hotspot 12

Category	Significance	Bulk cnt	Bulk wgt	Enviro Abundance	Enviro wgt	SF cnt	SF wgt	Total cnt	Total wgt (kg)	Analysis	Illust.	Assessor name	Conservation	X-Ray
Post-medieval pottery	Low	0	0.000	0	0.000	22	0.443	22	0.443	No	No	Sue Thompson (WA)	No	No
Magnetically responsive	Low						0.000		0.000	No	No	Freddie Lowrie-Sisson (WA)	No	No

No further work is recommended.

Ecofacts

3.6.3 None – (no samples taken and no animal bone recovered)

Radiocarbon dating

No. of radiocarbon results achieved: 0

No. of further radiocarbon determinations recommended: 0

No samples taken, thus no potential for radiocarbon.

Research

3.6.4 No further post excavation work and/or analysis is recommended. The results from the Hotspot 12 investigation are not of regional significance and does not merit publication.

Hotspot 17

Periods

None

Site summary

3.6.5 No archaeological features, deposits or finds were identified during the excavation of Hotspot 17.

Stratigraphy

3.6.6 No features

Artefacts

3.6.7 There were no artefacts recovered during the archaeological investigation at HS 17, therefore no further work is recommended.

Ecofacts

3.6.8 No samples taken and no animal bone recovered.

Radiocarbon dating

No. of radiocarbon results achieved: 0

No. of further radiocarbon determinations recommended: 0

3.6.9 No radiocarbon dates obtained or required.

Research

3.6.10 None

4 PROJECT OUTPUTS AND THEIR DISSEMINATION

4.1 Stage 1: Archive reports and project GIS

Project GIS

4.1.1 In order to produce the phase plans necessary to complete the final archive reports and to aid the kind of analysis necessary for publication, it is desirable that a project GIS be created. This GIS should be linked to a searchable spatial database that will include all context numbers given during the excavations. Each group of contexts should be placed as far as possible within a dated site phase.

Archive reports

4.1.2 For each site a final report detailing the results of the analysis phase will be deposited along with the paper and digital site archive at the national archive in Aberystwyth (ALGAO, 2015; Historic England, 2015, p. 11). A copy of each of the final reports will also be deposited at the HER in Bangor. For the two sites for which no further post-excavation work is proposed, the site archive report will comprise an identification of the archive repository (Oriel Ynys Mon, Rhosmeirch, Llangefni), an index, copy of relevant extracts from the evaluation and metal detection reports, copy of the project WSI, copy of the post-excavation assessment method statement, copy of the post-excavation assessment report, any specialist reports relevant to the site, an extract from this UPD detailing that no further work is required, note on the archive discard and retention policies applied.

4.1.3 For the rest of the sites, where further post-excavation work is to be undertaken, the site archive report will comprise the same as above, together with specialist reports on the further analysis that has been undertaken. The physical and digital archive data will be prepared in accordance with the requirements of Oriel Ynys Mon and with specifications presented other established guidelines (Archaeological Data Service, 2013; CIfA, 2014).

4.2 Stage 2: Archive preparation and deposition

4.2.1 By the time this Updated Project Design is actioned, a significant degree of archive preparation will have been completed. This work was planned for within the post-excavation assessment stage work (Stoakley, M. and Gardiner, L., 2019, pp. 6–7 & 13–

14), which is still ongoing at the time of writing. Important sections of the documentary archive still reside with the archaeological companies sub-contracted to write the Post-excavation Assessment reports and these have not yet been transferred into the appropriate archive boxes. Brython hold the documentary archive for Areas 7, 8 and 15, and for all of the excavated Hotspots. GAT hold the documentary archive for the EV9 sites and for Area 20. WA have agreed in principle to collect this material and secure the archive in the short term, until a contractor has been appointed to undertake the analysis and publication phase. However, this would meanthat funds need to be found during the analysis phase to cover the costs of transport during deposition.

4.2.2 The small quantity of prehistoric pottery still resides with the specialist, Frances Lynch (Table 61). More than a thousand kilograms of slate reside at the Menai Bridge compound. These are recommended for discard, as no visible signs of working or engraving were observed when they were examined. A small quantity of slate should be selected and offered to the Oriel Museum, should they wish to recreate a cist burial for display purposes. Pollen and diatom sub-samples from the monoliths from Area 4 and Hotspot 11/13 reside with Allen Environmental. All other finds and ecofact are currently being stored at Wardle Armstrong's Carlisle office.

4.2.3 The digital archive is currently being centrally stored on WA's servers. A specific drive 'the W: drive' is being used for this purpose.

Table 61 Location of elements of physical archive in March 2021

Item	Location (March 2021)	Comments
Slate	Menai Bridge compound	From Area 7 and Area 15
Human remains	Cardiff University	Not within the scope of this UPD
Prehistoric pottery	Francis Lynch	From Areas 2, 3, 9, 14, 15, 17, HS 7-9, HS 11-13, HS 14, HS 15 and the EV9 cable diversion sites
Pollen and Diatom sub-samples	Mike Allen (Allen Environmental)	From Area 4 and HS11-13
All other artefacts and ecofacts	WA (Carlisle)	For all excavations (Areas and Hotspots)

4.2.4 It is Wardell Armstrong's understanding, formed by the contractual terms of our engagement with Horizon Nuclear Power, that following the completion of the post-excavation assessment work the entirety of this archive will become the responsibility of Isle of Anglesey County Council. Concrete arrangements, therefore, need to be

made for the transport and handover of the archive, as the process of post-excavation assessment draws to a close over the next couple of months. The following sections detail where the physical, documentary and digital archives ultimately need to be deposited, and how they need to be arranged.

Physical archive

4.2.5 The physical archive should eventually be deposited with the Oriel Ynys Môn museum. There is a charge per box of ecofacts and / or artefacts of £100. Once analysis and publication photography have been completed, the physical archive will need a final check to make sure that it meets the current guidelines supplied by the Oriel Ynys Môn museum. These state that every individual find will require its own unique accession number. This needs to be marked on every find e.g. 35/20156.1. If the artefact or ecofact cannot be marked with its unique identifier, it can be marked on the bag and then logged onto the spreadsheet. This list will need to be tabulated and recorded on an MS Excel spreadsheet. This number will need to go on the bag and box as well. For organic and metal finds, this will not be possible so writing the number on the bag will suffice. Finds in every archive are then stored in the box by material type and then by the museum acquisition number.

4.2.6 The ideal weight of the box is 6kg. Any box over this weight will need to be marked 'heavy' with the weight recorded on it. Some of the stone artefacts will need separating, therefore the box count will increase.

4.2.7 Metalwork is regularly checked and may need re-packing with the humidity indicator and silica gel being monitored.

4.2.8 Organic and waterlogged finds are currently stored in appropriate conditions in the Wardell Armstrong cold store in suitable bags and boxes. These finds will need monitoring periodically during the analysis phase.

4.2.9 There are two acceptable sizes of finds box:

1. 370mm x 290mm x 250mm
2. 370mm x 290mm x 125mm

4.2.10 Within the Wardell Armstrong warehouse there is a total of 81 finds boxes, 19 environmental boxes, with 23 additional items currently in Wardell Armstrong's cold

store. There is a total of three boxes of environmental paperwork, bringing the total count to **126**. It should be noted that the finds box figure will increase when some stone artefacts are re-boxed to allow for the correct box weights.

4.2.11 It should be noted that Oriel Ynys Môn will not cover the costs of transporting the archive to the museum; courier costs will need to be considered.

4.2.12 A list of national guidelines for archiving standards will be followed:

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

CIfA 2020, Standards and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials. Reading: Institute for Archaeologists.

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

Edwards, E 2013, RCAHMW Guidelines to Digital Archives. RCAHMW (version 1).

Oriel Ynys Môn (unknown date), Guidelines for the preparation and deposition of archaeological archives. Oriel Ynys Môn.

Society for Museum Archaeology 2020a, *Standards and Guidance in the Care of Archaeological Collections*. Society for Museum Archaeology.

Society for Museum Archaeology 2020b, *SMA Material Fact Sheet: Ceramics (including bulk finds).* Society for Museum Archaeology.

Society for Museum Archaeology 2020c, *SMA Material Fact Sheet: Metals (Ferrous*). Society for Museum Archaeology.

Society for Museum Archaeology 2020d, *SMA Material Fact Sheet: Glass*. Society for Museum Archaeology.

National Panel for Archaeological Archives in Wales 2017 (NPAAW), http://www.heritage-standards.org.uk/new-welsh-archaeological-archives-standard-2017/.
Watkinson, D.E. & Neal, V. 1998, First Aid for Finds. RESCUE: The British Archaeological Trust (London).

Documentary archive

4.2.13 The documentary archive is to be deposited at Anglesey Archives (Archifau Ynys Môn) in Llangefni. There is a charge of **£100** per documentary archive box.

4.2.14 The documentary archive, comprising documents and digital data, needs to be contained in acid-free documentary archive boxes (both large and small); every

document needs to be quantified and inventoried on the internal archive box and index sheets. All staples need to be removed as per national standards. Preparation can take up to two hours for a small site (e.g. Hot Spot 6), or up to two-three days for a large site (e.g. Area 15). The documentary archives still require reorganising into their archivable state. This will be undertaken upon sign-off of each of the assessment reports.

4.2.15 There are currently 26 folders containing documentary archives as well as eight plan rolls in the Wardell Armstrong Carlisle office. This quantity excludes archives (including documentary and material) with subcontractors, including the human remains.

Digital archive

4.2.16 The digital archive for each site will be prepared according to RCAHMW and Oriel Ynys Môn standards.

4.2.17 The digital archive should include the project design or brief along with all relevant reports in PDF format. Also to be included is research documentation (relevant maps and HER data), MS Excel spreadsheets (finds & enviro), AutoCAD (DWG), ArcGIS (.DBF/ESRI shapefiles) plus all photographs (uncompressed TIFF file format). Additionally, the digital archive will include scans of the original paperwork compiled in field (including registers and recording sheets e.g. context, masonry, skeleton). The drawings were scanned in at the digitisation stage. The JPEGs will need to be converted in this instance. All files need to be logged onto an MS Excel spreadsheet labelled as 'metadata'.

4.2.18 Certain documents must accompany the digital archive, to include the Archive Information Form, File Information Form and archives deposit agreement. As per national guidelines (Brown 2011 & NPAAW 2017), all confidential data will be removed from the archive; this includes project staffs' email addresses and telephone numbers, risk assessments, internal QA documents and documents such as SMCs etc.

4.2.19 File name example: 35/2016_AREA15_REPORT

4.3 Stage 3: Dissemination of results

Public engagement booklet

4.3.1 Five hundred hard copies of a free public engagement booklet should be produced fordissemination of the findings to the local community, also to be available as a freely downloadable PDF submitted to the Archaeological Data Service. The booklet should be mainly illustrative, produced in full colour, with photographs of the excavations and finds set alongside site plans and explanatory paragraphs of text. The word count should be minimum of 4,000 and a maximum of 6,000 words. The booklet should be written for the general public, keeping the language clear and simple, and should not assume prior knowledge of archaeological periodisation and terminology.

4.3.2 The booklet should include sections on:

1. Background to the Wylfa Newydd project
2. Evidence of hunter-gatherer groups
3. The emergence of farming
4. Iron Age and Roman settlement
5. Early medieval cemeteries and human remains
6. Where to find further information, museums to visit, etc.

Academic Monograph

4.3.3 A monograph synthesising the results of the individual archive reports should be written, to be 80,000-150,000 words in length, excluding data tables and bibliographic references. It is to contain at least ten interpretive GIS figures, 60 site plans, a figures of section drawings including features from each phase of every site. Specialists working on the assemblages should be asked to conduct inter-site comparisons and to submit publishable overviews of data from the 32 sites within their specialism. Communication between those writing up the stratigraphic narrative and the specialists should be encouraged through holding a one-day symposium, to be held approximately 6 months after the project start date at an appropriate location in NW Wales. Follow up discussions using video-conferencing technology should be held following submission of the initial reports, and again once the publication texts have been drafted.

Chapters to be included in the monograph (to be reviewed at the initial symposium):

Preliminaries

- List of contributors
- List of contents
- List of figures
- List of tables
- List of photographs
- Acknowledgements

Introduction

- Background to the excavations, objectives, methodology and funding model
- Timeline of works
- Topographical setting
- Geophysical surveys, evaluations and watching brief works (including an assessment of the site identification methodology)
- Archaeological assessment
- Outline of publication

Late Mesolithic and Neolithic evidence

- Artefact scatters
- Features and in situ finds
- Chronology and Radiocarbon dating
- Finds analysis (overviews of lithic and ceramic assemblages)
- Environmental analysis
- Regional parallels and conclusions

Bronze Age evidence

- Introduction
- Site types
- Features and in situ finds
- Chronology and Radiocarbon dating
- Finds analysis (overview of lithic and ceramic assemblages)
- Environmental analysis
- Regional parallels and conclusions

Iron Age and Romano-British settlement evidence

Area 19 & Area 20

- Topographic setting
- Site plans, stratigraphic phasing and section drawings
- Chronology and Radiocarbon dating
- Finds analysis
- Environmental analysis
- Conclusion

HS 15

- Topographic setting
- Site plans, stratigraphic phasing and section drawings

- Chronology and Radiocarbon dating
- Finds analysis
- Environmental analysis
- Conclusion

Area 15 and Area 9

- Topographic setting
- Site plans, stratigraphic phasing and section drawings
- Chronology and Radiocarbon dating
- Finds analysis
- Environmental analysis
- Conclusion

Area 4

- Topographic setting
- Site plans, stratigraphic phasing and section drawings
- Chronology and Radiocarbon dating
- Finds analysis
- Environmental analysis
- Conclusion

Overview of finds analysis (including inter-site comparisons)

Regional parallels and conclusions

Early medieval cemeteries and other funerary evidence

Area 15

- Topographic setting
- Site plans, stratigraphic phasing and section drawings
- Chronology and Radiocarbon dating
- Human remains (osteology, aDNA, isotope analysis (diet/origins)
- Finds analysis
- Environmental analysis
- Conclusion

HS 11/13

- Topographic setting
- Site plans, stratigraphic phasing and section drawings
- Chronology and Radiocarbon dating
- Finds analysis
- Environmental analysis
- Conclusion

Area 7

- Topographic setting
- Site plans, stratigraphic phasing and section drawings
- Chronology and Radiocarbon dating
- Finds analysis
- Environmental analysis
- Conclusion

Regional parallels and conclusions

Conclusions and updating of research agenda

- Late Mesolithic/Early Neolithic
- Late Neolithic/Early Bronze Age
- Middle to Late Bronze Age
- Iron Age/Roman
- Late Roman Early medieval

5 RESOURCES AND PROGRAMMING

5.1.1 As the institution to undertake the post-excavation analysis and publication is yet to be decided this section will outline the order in which the various post-excavation tasks should be carried out and the necessary skill sets of the team member, or members, involved in each task and indicative timescales.

Staff needed to complete the Stage 1 post-excavation analysis work:

Editorial management and proof reading - 32 weeks

Two individuals - 32 weeks each

Illustrator (finds) - 4 weeks

Design/GIS technician (figure production) – 8 weeks

Staff needed to complete the Stage 2a: popular fascicule

Editorial management and proof reading - 4 weeks

Writing of text, selecting plans and images, communicating with designer - 16 weeks

External designer: Combining text and images in, for example, Adobe InDesign - 4 weeks

Staff needed to complete the Stage 2b: monograph

Main author, editor – 104 weeks

Assistant – 52 weeks

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APPENDIX 2 - OSTEOLOGICAL REPORT (AREA 15)

2020

The Human Bone from Wylfa Head

CIARA BUTLER AND RICHARD MADGWICK

Prepared for:

Archaeoleg Brython Archaeology

INTRODUCTION

The entire human osteological assemblage from Wylfa Head was received by Cardiff University in April 2019. An assessment of the material was completed in July 2019. The assessment (see Appendix 1) focused on the preservation state of the assemblage and established aims and objectives for complete osteological investigations.

Complete osteological analysis was finalised in September 2019. This involved determination of age and sex, identification of pathology, stature estimation, and dental analysis, as well as clear identification of appropriate individuals for further biochemical analyses. Results were compared with similar cemetery sites and osteological assemblages across Wales. All material was analysed in the Bioarchaeology Laboratory by Ciara Butler, with the assistance of Thomas Goodwin and under the supervision of Dr Richard Madgwick (Lecturer in Archaeological Science). All analysis adhered to the Cardiff University School of History, Archaeology, and Religion (SHARE) Code of Ethics.

ARCHAEOLOGICAL SUMMARY

Archaeological investigations at Wylfa Head began in 2016 in advance of building plans for the Wylfa Newydd power station. Evaluation was conducted by Headland Archaeology. 19 probable graves within the cist cemetery at Wylfa Head were identified at this stage, and a single radiocarbon date was obtained from excavated human bone. This placed the burial within the 8th Century AD (Headland Archaeology 2017). Recommendations were made to find the extent of the cemetery and excavate it fully. Upon the completion of excavation by Archaeoleg Brython Archaeology (ABA) in 2018, the cemetery comprised 314 graves in total, making it the largest fully excavated in North Wales. Cist graves make up the majority of this; only 48 graves were earth cut with no form of stone lining. Out of this total, 109 graves contained the remains of 119 discrete individuals in varying states of preservation. A further 21 fragments of disarticulated human bone were recovered from non-grave contexts.

A total of seven graves (G80, G99, G113, G116, G243, G287, G294) were identified as containing more than one individual in the field, though separate skeleton numbers were not always assigned. This is likely due to poor preservation as identifying which elements belonged to which individual could be difficult. The number of graves containing two or more individuals was amended to 10 during osteological analysis when repeated elements were discovered in a further three burials (G121, G281, G233), bringing the minimum number of individuals (MNI) to two for each. The second individual in G233 comprised burnt fragments of human skull. Of the shared burials, some were

likely a double interment (though poor preservation makes this hard to discern), while a clear instance of grave reuse can be seen in G80. Some extra elements within graves were undoubtedly the result of disturbing an earlier burial. Of the excavated graves, 48 were earth cut while the remainder had some form of stone lining: six had capstones only, 72 had side stones, 175 had cap and side stones, nine had side, cap and base stones, two had base stones only, one had base and side stones and one had capstones and two layers of side stones. Due to truncation it was often unclear whether some graves were originally fully or partially lined. Some may have had capstones removed, and some graves were disturbed while interring another individual. Others were truncated due to modern machining.

As has been noted in other cemeteries of this period, there appears to have been an initial focal point which must have held some significance. At the Wylfa Head cemetery this was identified as a dense concentration of graves which seemed to have some structural elements. This area was denoted as F296. Graves within this feature were densely packed, with others outside oriented around the feature (Hudson et al. 2018). Orientation in the cemetery was generally west-east with head to the west, although in some areas rows of graves are oriented closer to NW-SE, possibly due in part to the topography of the site.

METHODOLOGY

Standard osteological analysis of all human remains was undertaken, according to the guidelines of the British Association for Biological Anthropology and Osteoarchaeology (BABAO) in association with the Chartered Institute for Archaeologists (Brickley and McKinley 2004). The recommendations of Buikstra and Ubelaker (1994) and Mitchell and Brickley (2017) were also followed. Human bone and teeth were identified with reference to White et al. (2012), Scheuer and Black (2004), and the Cardiff University Bioarchaeology reference collection. Contextual information including skeleton field sheets provided by ABA were also consulted.

Both degree of completeness and preservation state (abrasion/cortical layer damage, staining of bone, presence of cut marks) were recorded, using percentages, a graded scale, or descriptive terms ranging from superficial to severe. Preservation was recorded during the assessment phase following the system of Brickley and McKinley (2004) and reconsidered against the taphonomic analysis undertaken during this phase of analysis. Human bone inventory and completeness were recorded in tandem, with each element being identified according to Table 1 (below). Surviving skeletal

elements were also illustrated on diagrams adapted from Buikstra and Ubelaker (1994), as was the dental inventory.

Classification	Level of completeness
Complete/nearly complete	>95%
Excellent	75-94%
Good	50-74%
Fair	25-49%
Poor	5-24%
Extremely poor	<5%

Table 1: *Classification system for skeletal completeness*

Standard methods of age determination were attempted following Scheuer and Black (2000), Brooks and Suchey (1990), Brothwell (1981), and Buikstra and Ubelaker (1994) methods in examining length of juvenile long bones, epiphyseal fusion, pubic symphysis degeneration, dental attrition, and auricular surface morphology. Age categories were adopted from Márquez-Grant and Loe (2008) and are reproduced in Table 2. However, due to fragmentation many methods of ageing were not available, and dental attrition was the most frequently employed. To this end, Lovejoy (1985) provided additional data.

Age Category	Chronological Years
Foetus	2nd trimester – birth
Perinate	~ birth
Neonate	Birth – 1 month
Infant	1 month – 2 years
Young Child	2 - 5 years
Older Child	5 -12 years
Adolescent	13 -17 years
Young Adult	18 – 25 years
Middle Adult	26 – 35 years
Mature adult	36 – 45 years
Old Adult	45+
Non-adult	<18 years
Adult	>18 years

Table 2: Age categories used in analysis of Wylfa Head population

Sex was determined using Buikstra and Ubelaker (1994) methods in examining the skull and pelvis. The morphology of the distal humerus after (Vance et al. 2011) was also used. Additional data has in some cases been provided by osteometric methods where possible, in particular Bass (1995) and the Tennessee Forensic Database.

Pathology was recorded in accordance with Ortner (2003), and stature was determined using Trotter (1970). Non-metrics traits were identified with reference to Buikstra and Ubelaker (1994) and Mann et al (2016). Tooth morphology followed the ASUDAS system (The Arizona State University Dental Anthropology System) (Scott and Irish, 2017). Investigations were undertaken on both articulated and disarticulated remains. Wherever possible, separate individuals were identified. All bone specimens were analysed macroscopically, with no microscopic observations necessary. In some instances, a hand lens was used in the analysis of pathological alterations and taphonomic modifications. All articulated material was recorded on standard recording sheets. Individual summaries for each skeleton (following osteological investigations) are included in Appendix 2. No x-rays were required to investigate pathology due to its low occurrence.

All data was recorded on Cardiff University Bioarchaeology skeletal recording sheets following established laboratory protocol.

AIMS AND OBJECTIVES

- Determination of sex, age and stature of individuals.
- Determination of minimum number of individuals in the case of disarticulated bone.
- Determination of any skeletal manifestations of disease and trauma.
- Examination of patterns of preservations to determine depositional histories.
- Comparison of data from Wylfa Head with that of other Early Medieval cemeteries from Wales.
- Examination of any correlations between grave location and age, sex and/or non-metric traits.
- Identification of suitable samples for future isotope and/or aDNA analyses.

RESULTS

PRESERVATION STATE

A total of 119 individuals from burial contexts have been analysed. Following the initial osteological assessment (see Appendix 1) of completeness, 92% of the sub-sample were identified as less than 25% complete. More detailed recording of completeness at analysis stage added further categories of <5% ("extremely poor") and >95% ("complete") in order to develop a clearer picture. This information was recorded both for element and individual. A summary of individual completeness after analysis is given in Table 3.

Completeness	Number of individuals	% of total (n=119)
Complete/nearly complete	0	0%
Excellent	0	0%
Good	3	3%
Fair	8	7%
Poor	56	47%
Extremely poor	48	40%
Not applicable*	4	3%

Table 3: Completeness results by individual

*A skeleton was classed as "not applicable" when there was uncertainty as to which individual elements belong to in the case of some double graves.

The majority of individuals (104, or 87%) analysed were less than 25% complete, and a significant part were less than 5%. None were over 75%. Despite these low levels of individual completeness, investigation by element showed variability within this. Some individuals had intact crania of more than 75% complete, and one skull was classed as >95% complete (SK10.1109, G62). SK10.1397 (G308) had a mostly intact vault but with the left maxilla and temporal bone missing. SK10.0348 (G217) had similar but more extensive damage to left side of skull, involving parts of the occipital also. However, this cranium was still over 75% present. The cranium of SK10.0762 (G256) was just under 75% with a well-preserved vault but facial structures missing.

At assessment stage, a sample of the assemblage was scored according to Brickley and McKinley's (2004) cortical damage scale for abrasion/erosion. During analysis this was extended to all individuals and elements represented. Notes were also taken regarding soil staining and other taphonomic alterations. No pre-depositional modifications such as gnawing, trampling or weathering were recorded in the assemblage derived from grave contexts. Levels of surface preservation are given in Table 3.

Cortical Layer Damage score	Number of individuals	% of total (n=119)
5+	29	24%
5	39	33%
4	27	23%
3	12	10%
2	0	0
1	0	0
0	0	0
Not applicable*	12	10%

Table 4: Levels of surface preservation by individual

*Individuals were classified as "not applicable" where only trabecular bone or teeth survived.

These results tally with those of the osteological assessment, during which no individual was scored better than a 3, and the majority of individuals were scored at 5. A score of 3 is defined as "most of the bone surface affected by some degree of erosion; general morphology maintained but detail of parts of surface masked by erosive action". Even the better-preserved skeletons of the assemblage with scores of 3 had enough surface damage in parts to potentially obscure pathological conditions. A score of 5+ is equated to "extensive penetrating erosion resulting in modification of profile" (Brickley and McKinley 2004: 16).

All individuals exhibited post-mortem fragmentation, and most had varying degrees of staining. As evidenced by the scores of 3 and above for condition, all remains were affected by surface erosion. These features are consistent with the burial environment, particularly as a result of the acidic soil rather than heavy truncation or disturbance. Additionally, several interesting cases of taphonomic alteration were observed. For example, potential water damage in the clavicle of SK10.0931 was initially considered to be a possible fracture callus at assessment stage (SK10.0931, G56). During drying from wet or submerged conditions long bones can crack and warp (Pokines and Symes, 2013) and this individual was buried in a cist which was not backfilled. Drying cracks such as this were recorded in several other skeletons. In addition to this there was evidence of insect activity, root staining in several individuals, and several bone fragments with organic staining that could be mistaken for burning.

Figure 1: Intact cranium of SK10.1109 showing taphonomic lateral compression

Figure 2: Taphonomic changes in SK10.0931, similar in appearance to a fracture callus on the right clavicle. Note the lack of transverse fracture lines; instead there is a longitudinal postmortem crack.

Figure 3: Insect activity in a fragment from SK10.1607

Variable preservation across the site can be accounted for in many instances by burial context. Of the 108 graves containing human remains, 84% (n=92) were stone-lined cists with capstones, though in some instances later disturbance had removed some of the original structure. This grave type made up 55% of all burials within the cemetery (n=175). Due to the acidic nature of the soil, the best preservation was in capped cists which were not backfilled, leaving the remains in a void. For example, G56 (SK10.0931), G62 (SK10.1109), and G256 (SK10.0762), which all contained skeletons of fair to good preservation with scores of 3 to 4 for surface preservation. In some cases, later disturbance meant a void cist was partially filled with soil. However, it was still possible to ascertain that the grave had not backfilled at the time of burial. Variability in skeletal preservation being affected by soil contact can be seen clearly in G217, which was originally a void cist burial but where partial collapse of the capstones at the foot end resulted in poor survival of elements of the lower body while preservation of the upper body was much better (see Figure 5).

Of the remaining graves containing human remains, 10 were cists (including partial cists and fragmentary cists) without capstones. Three were graves with no side stones but capstones or possible capstones, one was a capped cist with possible base stones, one had base stones but no cist or capstones (this was also disturbed). It was noted that grave type upon excavation may not represent the original structure, as disturbance may have removed cist or capstones. Only one dug grave (no cist or capstones), G240, contained human remains but had but this had been disturbed prior to excavation.

Figure 4: *SK10.0348 from G217, in the field and in the lab.*

AGE AND SEX

The estimation of biological sex relies primarily on the morphology of the pelvis and the skull. Within the Wylfa Head assemblage, this presented major difficulties due to the lack of survival of pelvic elements. For most skeletons, the only available features to aid in the estimation of sex were those of the skull (e.g. nuchal crest, glabella, mental eminence etc.). It is important to note that skulls may not always represent the best means of determining an individual's sex, as morphology is population-specific, and variation may exist between cranial features and those of the pelvis. In the case of the Wylfa Head material, skeletons with sexually dimorphic characteristics on the skull only could at most be classed as possible male or possible female. Sometimes an individual was classed as inconclusive if these characteristics were present but ambiguous. One individual was sexed with additional data from the morphology of the distal humerus according to Vance et al. (2011). Metrical analyses of the long bones were used to support the estimation of sex in one individual (SK10.1397, G308). Sex estimation for juveniles was not attempted.

	Number of individuals	**% of total (n=119)**
Male	1	0.8%
Female	1	0.8%
Male?	4	3.4%
Female?	3	2.5%
Juvenile	6	5%
Indeterminate	104	87.4%

Table 5: *Results of sex estimation*

Sex estimation could only be achieved for a maximum of nine individuals, even tentatively. This extremely low proportion is due to the almost total absence of pelves within the assemblage. When these elements were present, they were in small fragments which obscured their morphology. No pelvis was recovered without part, or all, of the diagnostic sexing elements missing. This may be due to these elements' lower position in the grave, and vulnerability of the structure of trabecular bone with thin cortical layer to the effects of erosion. The same trend of poor survival was noted for vertebrae, which are at a similar level in a supine extended burial. Generally poor surface preservation and high fragmentation meant that secondary diagnostic elements on the skull or distal humerus were often absent also.

Individual	Age estimate (years)	Method
10.0016	Adult	Dental attrition
10.0118	17 – 25?	Dental attrition and eruption
10.0294	7 – 12	Dental eruption
10.0342	12 – 17	Dental eruption and crown formation
10.0348	25 – 35	Dental attrition
10.0430	25 – 45	Dental attrition
10.0457	young adult	Dental attrition
10.0471	25 – 40	Dental attrition
10.0516	17 – 30	Dental eruption and attrition
10.0579	40 – 60	Dental attrition, auricular surface
10.0595	24 – 35	Dental attrition
10.0612	12 – 17	Dental eruption
10.0620	25+	Epiphyseal fusion
10.0697	16 – 25	Dental attrition
10.0715	17 – 25	Dental attrition
10.0727	10 – 18?	Dental attrition
10.0745	33 – 55	Dental attrition
10.0747	25 – 35?	Dental attrition
10.0749	17 – 25?	Dental attrition
10.0762	33 – 55	Dental attrition
10.0776	25 – 55	Dental attrition
10.0784	14+	Epiphyseal fusion
10.0785	25 – 35	Dental attrition
10.0807	16 – 25	Dental attrition
10.0875	14+	Epiphyseal fusion
10.0931	22 – 25	Epiphyseal fusion, dental eruption
10.0949	16+	Epiphyseal fusion
10.0971	17-25	Dental attrition
10.0979	14+	Epiphyseal fusion
10.0997	17 – 25?	Dental attrition
10.1028	25 – 40?	Dental attrition
10.1061	17 – 30	Epiphyseal fusion, dental attrition
10.1103	16+	Epiphyseal fusion
10.1109	18 – 25	Dental eruption and attrition
10.1188	12 – 17	Dental crown formation and attrition
10.1221	14+	Epiphyseal fusion
10.1236	12 – 25	Dental attrition

Table 6: Age-at-death estimates and methods available

Individual	Age estimate (years)	Method
10.1317	17 – 25	Dental attrition
10.1355	7 – 13	Mixed dentition
10.1397	33 – 35	Dental attrition, cranial suture closure
10.1480	17 – 25?	Dental attrition
10.1596	25 – 45	Dental attrition
10.1607	Adult	Dental attrition
10.1632	16 – 25?	Dental attrition
10.1703	6 – 17?	Dental eruption
10.1709	16 – 25	Dental attrition
10.1741	11+	Dental eruption
10.1760	12+	Dental attrition
10.1770	25 – 35	Dental attrition
10.1772	17 – 25	Dental attrition
10.1774	18+	Epiphyseal fusion
10.1787	5 – 16?	Dental crown formation and attrition
10.1801	25 – 35	Dental attrition
10.1993	35 – 50	Dental attrition
10.2129	17 – 25	Dental attrition
10.2182	7 – 9	Mixed dentition
10.2289	Adult	Dental attrition
10.2442	17-25	Dental attrition
10.2921	7 – 13?	Mixed dentition
10.2924	17 – 25?	Dental attrition
10.2925	17 – 25	Dental attrition

Table 6 (cont.): Age-at-death estimates and methods available

The estimation of age is also aided by features of the pelvis, for example the auricular surface and pubic symphysis. Because these were either absent or too fragmentary to use, age was determined mainly based on dental attrition (or eruption) as teeth were more commonly present. For sub-adults, identification relied on dental crown formation and eruption. Attrition-based age estimates in adults present some difficulty as they are population specific. However, Brothwell's (1981) data is derived from British populations from the Neolithic to Medieval periods, so is relevant here but must still be used with caution. Additional data on dental attrition was provided by Lovejoy (1985), though this was found to demonstrate different patterns of wear than those evidenced by the Wylfa Head population. The existence of pathological conditions (such as osteoarthritis) were not utilized to inform on age-at-death, due to their low occurrence/visibility in the assemblage, although it is

possible to provide broad indications of age from this. In some instances, cranial suture closure after Buikstra and Ubelaker (1994) was referenced, though with the acknowledgement that pathological conditions can alter the rates of fusion.

In total, 61 individuals from Wylfa Head could be assigned to an age group with more definition than the adult-v-subadult categories estimated during the assessment stage. Poor preservation makes many of these estimates tentative at best, as in the above cases with question marks where only a few loose teeth survived. For the purposes of analysis, summary ages were derived by taking the middle of the ascribed range and, for adults, rounding it to the nearest decade (as appropriate). For example, individuals aged as 17–25 years were summarised as 20 years. The summary ages were then placed into a series of categories (Figure 6). Age estimates which only had a minimum (e.g. 16+) were not included.

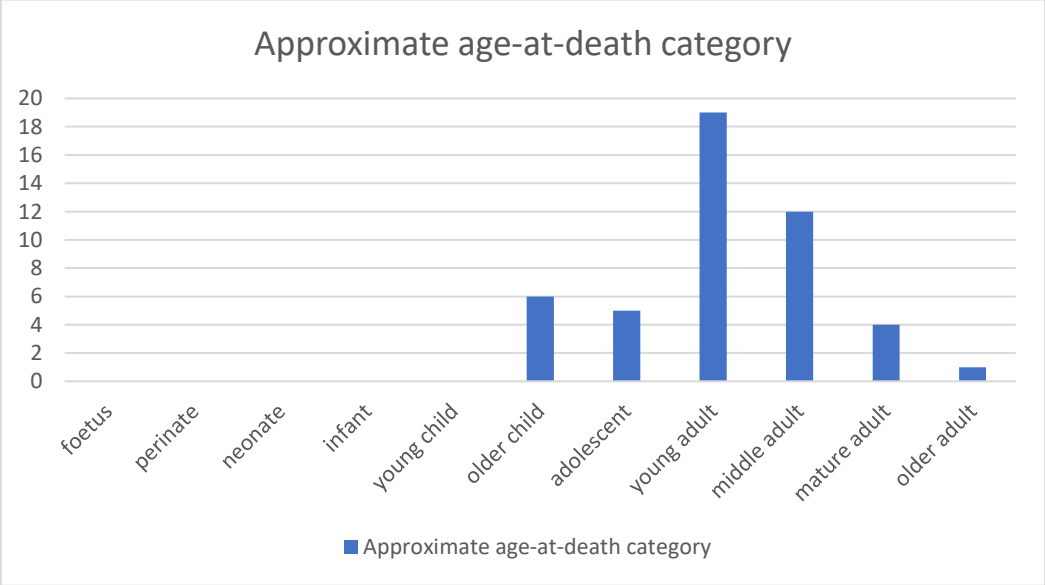

Figure 5: Number of individuals in each age category

There is a peak in the young adult category (18 – 25 years). This is possibly an artefact of recovery bias, as lack of data on older adults may be due to the poorer survival of heavily worn teeth, or perhaps lower levels of dental attrition in this community, which may make the teeth of older individuals appear to belong to a younger person. Without availability of other methods such as pubic symphysis degeneration or auricular surface morphology, it is not possible to further explore this possibility. The age-at-death estimates for Wylfa are tentative in many cases, and it is unlikely this age category saw the highest death rate in the community/communities using the burial ground. The age distribution shown is likely the result of preservation and methodological issues. However, it

is possible that this cemetery does not represent a complete population and burial here could have been reserved for those of at least adolescent age.

The rough estimates of age based on grave size provided a 21% juvenile proportion (Hudson et al. 2018). Osteologically, it was determined that among the aged individuals 18% were juveniles. This may seem slightly too low to be a representative cemetery population, as estimates of juvenile mortality range from 30-50% in the ancient world (Waldron 1994). It is possible another area or burial ground was used for subadult burial. However, with poor preservation it would be hard to identify subadults (especially infant and younger) which may be buried in an adult grave.

The lack of comparable data for sex precludes cemetery wide demographic investigations such as mortality rates of age groups or across sexes, and burial location or grave type compared to age and sex.

METRIC ANALYSES

The combination of poor surface preservation and fragmentation of the material severely hindered the potential for metric analyses, especially measurements related to stature estimation. Only 16 skeletons presented at least one available measurement from those recommended by Buikstra and Ubelaker (1994). These are detailed in Table 6 below.

Cranial measurements were taken from seven individuals, though in some cases these were likely altered by taphonomic processes such as lateral compression (see Figure 1, page 6). A total of 12 individuals presented sufficiently preserved long bones for measurements to be taken, though in the majority of cases these were only diameters and circumferences of the midshaft. Measurements relating to stature estimation were only possible in two individuals, SK10.1109 and Sk10.1061, but even these were tentative due to the fragmentation of epiphyses. The height of SK10.1109 was calculated at 178cm +/-3 based on the right femur. SK10.1061 had a complete, or nearly complete, tibia measuring 38.7cm including the medial malleolus. However, Trotter and Gleser's (1970) original study did not include the medial malleolus, so the regression formulae based on tibial length can be problematic. Due to this and the fact that this individual is of unknown sex (formulae are different for the sexes), stature for this individual was not calculated. Fragmentation of the assemblage prevents any demographic investigations of stature or its links to diet and health.

Skeleton	Cranial measurements	Post-cranial measurements
10.0348	Yes	Yes
10.0579	No	Yes
10.0620	No	Yes
10.0745	Yes	No
10.0749	No	Yes
10.0762	Yes	Yes
10.0776	Yes	Yes
10.0807	Yes	No
10.0920	No	Yes
10.0931	Yes	Yes
10.0949	No	Yes
10.0997	No	Yes
10.1061	No	Yes
10.1109	Yes	Yes
10.1221	No	Yes
10.1397	Yes	Yes

Table 7: Individuals providing metric data (for measurements see individual recording sheets)

PALAEOPATHOLOGY AND TRAUMA

Various pathological conditions can manifest themselves on bone, from afflictions that relate to nutritional deficiencies to congenital and infectious diseases. Traumatic changes to bone ranging from fractures to repeated stress injuries are also visible in archaeological skeletal material. Some of the pathological conditions observed on the remains from Wylfa Head have an ambiguous aetiology even without the hindrance of poor preservation, for example those belonging to the group termed "non-specific indicators of stress". Given the poor level of completeness and mixed surface preservation of the remains, it is certain that some pathological conditions will not have been observable. Generalised damage to the cortical layer of most bones can obscure afflictions such as periostitis, or porotic hyperostosis of the cranial vault. In some cases, missing elements limited the detailed investigation of pathological conditions, for example in judging levels of skeletal involvement. The number of individuals with any of the skeletal diseases recorded is likely to be significantly underestimated, because diseased as well as unaffected elements may not survive. This is true to some extent in nearly all archaeological skeletal populations (English Heritage 2004), however it is likely exacerbated in this assemblage. In most studies, estimations correspond to the ratio of the number of cases / total number of skeletons – termed "crude prevalence" by Waldron

(1994). Expressing frequencies with respect to total bones or teeth present can go some way to overcoming this ('correction by representation', Dutour 2008), however we still cannot approach an estimate of true prevalence within the population. Site-wide investigations of pathological presence and distribution patterns were difficult due to the low visibility of conditions (see Table 7). As already detailed, only 10% individuals were more than 25% complete, while 10% were over 3 on the preservation score. Only five skeletons were scored 3 for preservation and were >25% complete (10.0931, 10.1709, 10.0348, 10.1774, 10.1397).

The following instances of disease and trauma may be taken as occurring within this subsample of roughly 20 individuals with adequate completeness/surface preservation to get a more accurate idea of health in the population. 13 individuals presented some form of visible pathological change, 7 of which are dental. No trauma (healed or otherwise), apart from musculo-skeletal stress markers, was recorded in the assemblage.

Skeleton number	Age	Sex	Details of condition
10.0294	7-12	Juvenile	Osteoarticular disease of atlas-axis, possible LEH
10.0342	12-17	Juvenile	Linear enamel hypoplasia (LEH)
10.0579	40-60	Male?	Endocranial lesions
10.0741	25+	Female?	Cribra orbitalia, degenerative joint disease of left hip
10.0745	33-55	Indet	Enthesophytes of linea aspera
10.0762	40+	Male?	Periapical cavities
10.0997	17-25	Indet	Caries
10.1061	21-30	Indet	Linear enamel hypoplasia
10.1317	17-25	Indet	Caries
10.1397	33-35	Female	Periapical cavity, periodontal disease
10.1709	16-25	Indet	Caries, periapical cavity
10.1772	17-25	Indet	Endocranial lesions

Table 8: Individuals displaying pathological or traumatic bone changes

1. NON-SPECIFIC STRESS INDICATORS

Non-specific indicators of stress, potentially related to nutritional deficiencies, chronic inflammation, or infectious disease, were recorded in four individuals. One case of mild or healed cribra orbitalia was recorded, in the right orbit of SK10.0471. Cribra orbitalia (porosity of the orbital roof), can range from mild microporosity to quite severe macroporosity with plaque formation. Though primarily attributed to iron-deficiency anaemia, cribra orbitalia is now considered to have multiple aetiologies,

including vitamin C and D deficiency, chronic inflammation, and haemorrhagic processes (Mann and Hunt 2005; Ortner 2003). Infectious disease has also been suggested as a possible cause of the anaemia resulting in these lesions when they are found to be widespread in a population (Stuart-Macadam 1991). Cribra orbitalia may or may not be accompanied by porotic hyperostosis, a similar condition present on the ectocranial surface of the parietals and occasionally the occipital. Vault lesions do not tend to occur without the orbits being involved. The left orbit of SK10.0471 was not present, but this condition is usually bilateral. This individual was a possible female, aged at least 25, and also had possible degenerative joint disease of the right hip (see below). The second affliction, porotic hyperostosis (PH), was not identified, likely due to high levels of cortical layer damage to ectocranial surfaces in this individual and across the assemblage. In total across the assemblage, 11 individuals had surviving orbits but no others with this condition were identified.

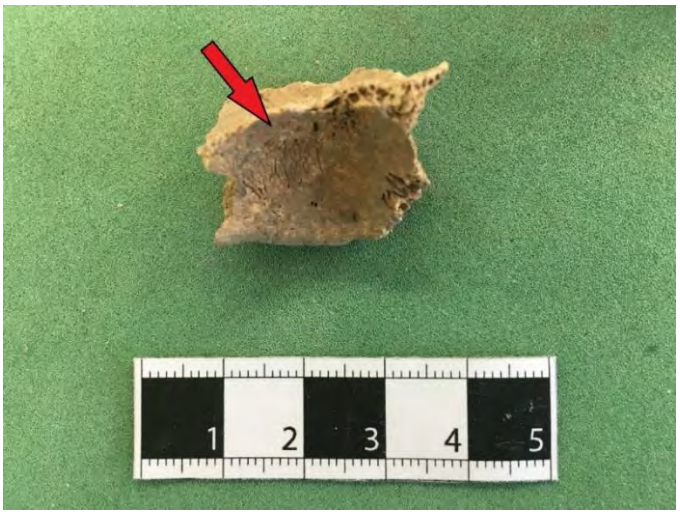

Figure 6: mild lesions associated with cribra orbitalia in SK10.0471

Dental/linear enamel hypoplasia (DEH or LEH) is a form of enamel defect considered to be a 'non-specific indicator of stress' occurring at the age of enamel formation. This stress may be due to nutritional deficiency, childhood illness, or localised trauma (Roberts and Manchester 2010). Hypoplastic lines appear as shallow or deep grooves encircling the tooth crowns. There were several cases of this (SK10.0294, 10.0342, 10.1061), along with a further two possible cases which were difficult to confirm due to being partially obscured by fragmentation. The affected teeth were incisors and canines. Age at crown formation for incisors is 6 months to 4 years, and canines in the first 6 years of life. Teeth were present in 59 individuals, so this is a rate of 0.05% - likely a result of taphonomy. It was difficult to clean teeth due to the extremely fragile enamel (see figure 14) which possibly affected the identification of this condition.

Figure 7: LEH in skeletons 10.1061 (left) and 10.0342 (right) (both canines).

2. JOINT DISEASE

The most commonly occurring manifestation of joint disease in archaeological skeletons is osteoarthritis. It can be recognised through eburnation, or the presence of osteophytes and a porous joint surface together. The hip and knee are often the most commonly affected joints, due to weight-bearing (Roberts and Manchester 2010). Another common area to see osteophystosis or other signs associated with degenerative joint disease (e.g. Schmorl's nodes) is the vertebrae. The low rate of observation for these conditions in the Wylfa Head population is again likely due to issues of preservation. Long bones epiphyses and vertebral bodies in this assemblage were almost entirely absent. When joint surfaces did survive, they were often partial, hindering observations. It is also likely that any new bone formation (osteophytosis) would have been more vulnerable to fragmentation, and porosity of the joint surfaces may be obscured by cortical layer damage.

Porosity possibly associated with degenerative joint disease was identified in SK10.0741 (Figure 8). Eburnation or osteophystosis was not present in this case, leading to difficulty diagnosing osteoarthritis. It is also important to note that poor surface preservation can mean taphonomic degradation mimics pathological alterations such as porosity. The corresponding acetabulum (hip socket) displayed the non-metric trait acetabular crease, (see anatomical variation, below) but this is unlikely to be related any degenerative joint changes.

Figure 8: Right femoral head of SK10.0741

Only one other case of joint disease was observed, in SK10.0294. Microporosity and minor lipping (osteophystosis), associated with degenerative osteoarthritis in adults, was present on both facets of the left first and second cervical vertebrae (C1-C2 articulation) in a juvenile aged 7-13. The individual was aged based on the presence of deciduous dentition, but the remains were very fragmentary, and no other osteological indications of age survived.

Figure 9: Pathological joint surface of the atlas (top) and axis (bottom) showing microporosity and slight osteophytosis. The hole in the articular surface of the axis is taphonomic, likely due to the weakened pathological bone.

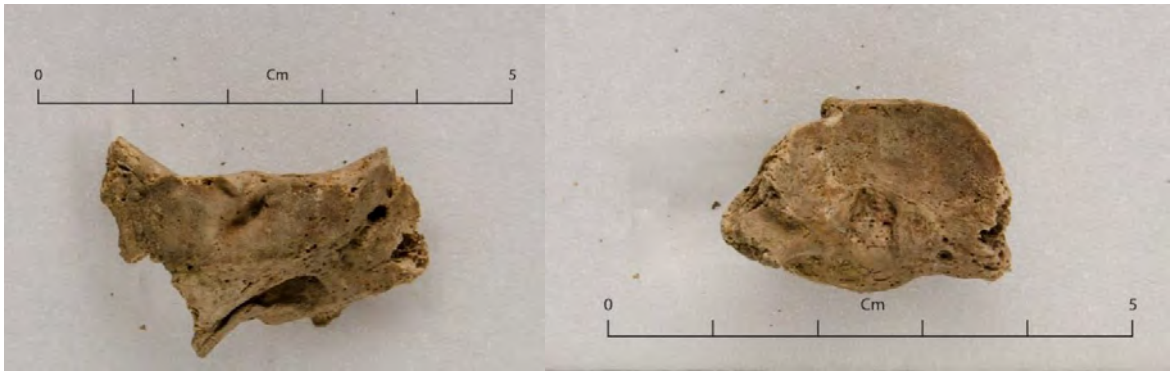

Figure 10: Lesion of the left atlantooccipital joint, with the occipital on the left and the atlas on the right

A linear lesion (Figure 10) of unknown aetiology was noted on the occipital bone, in the left atlanto-occipital articulation where the skull articulates with the first cervical vertebra (the atlas). This measured 0.5cm in length and 0.1cm in depth and had smooth margins. It may be traumatic or congenital, but this is difficult to investigate without the rest of the skeleton. The left atlanto-occipital joint is directly above the pathological C1-C2 articulation so this may be related.

The presentation of the pathology suggests osteoarthritis, but the age of the skeleton complicates this. Spondyloarthropathy is the term for a group of childhood rheumatic diseases which cause arthritis before the age of 16 and may span through adult life. This includes arthritis associated with

inflammatory bowel disease (also called enteropathic arthritis), and Juvenile Idiopathic Arthritis (Rothschild et al. 1997). Like rheumatoid arthritis in adults, it affects multiple synovial joints symmetrically, especially the small joints of the hands and feet, wrist, elbow, knee, shoulder and cervical spine (Roberts and Manchester, 2010). Although it does affect the cervical spine, these are the only joint surfaces present in the individual so multiple joint involvement cannot be investigated. In addition to this, juvenile spondyloarthropathy presents eroded bone on the joint edges and later on the joint surfaces. This does not fit with the presentation of joint disease in this case, which has no eroded edges and appears more like the mechanical and degenerative osteoarthritis present in older individuals. In addition, it is unlikely to be isolated from the lesion in the atlantooccipital joint, as the chances of the two appearing unconnected are low. For this reason, the C1-C2 joint disease is judged to be secondary to the lesion of the joint immediately above it. However, this poses problems too as the origin of the lesion is unknown. If the joint disease is mechanical due to the pressure from the above lesion, it has developed very quickly to be visible in a child of this age.

It is also possible that there are two different individuals in this grave, an older person represented by these vertebra fragments, and a juvenile represented by the teeth. The grave dimensions do not immediately suggest double burial - however, animal disturbance by mice at the foot end may mean that some bone fragments are intrusive.

3. MUSCULO-SKELETAL STRESS MARKERS

Enthesophytes were recorded in one individual. These appear as spike-like projections, ridges, or irregular ossification where tendons and ligaments attach to the bone. SK10.0745 displayed a thickened linea aspera (Figure 10), with a marked enthesophyte of 7cm length and 1.5cm breadth, projecting of over 1cm in height at its maximum. This type of enthesophyte is known to begin from the medial and lateral margins of the linea aspera (Takigawa 2014), but in this case both margins have connected due its marked expression and it is difficult to distinguish them.

The formation of enthesophytes can be considered as a part of stress-induced response from the bones which may represent instability of the joints, may be the result of aging, or could be the outcome or some form of repeated activity or trauma (Mann and Hunt 2005). It is also suggested that there is a link between the formation of enthesophytes and marginal osteophytes of joint surfaces, due to degenerative joint disease where the joint mechanics are altered in chronic strain. This link is not visible in the Wylfa Head assemblage. The age-at-death estimate for this individual is 33-55 years (based on dental attrition) and sex was indeterminate. Previous studies have suggested a relationship between musculo-skeletal stress marker expression and age. A study of a 19th Century

Japanese population (Takigawa 2014) showed the highest scores of musculo-skeletal stress markers, correlating to the level of expression in this case, were among 50-69 years age-at-death. It was also found that correlation between age and expression of these markers was more significant in the lower limb. Though these results are population specific, it may suggest that this individual is older than the teeth indicate. This individual has one of the most advanced examples of dental wear in the assemblage, so it is possible that attrition rates are low in the Wylfa Head population.

Findings suggest that stress-markers such as enthesophytes are age structured within human populations, but that differences also arise in association with intensity of activity. The presence and form of enthesophytes have been used in reconstructions of occupational activity in the past. Musculo-skeletal markers at tendon and ligament insertions may indicate movement using specific muscles or groups of muscles (Roberts and Manchester 2010), however there are many predisposing factors to development of these markers including age, hormonal and genetic factors, diet, and disease. Differences between the sexes in the development of these stress markers depends on the division of labour. Wilczak (1998) reported that populations with agriculture-based economies present the least dimorphism in lower extremities. A study of prehistoric Iberian groups found great variability in levels of sex differentiation between populations, and that pastoralist groups had higher levels of dimorphism (Al Oumaoui et al. 2004).

Figure 11: Enthesophyte of the linea aspera (SK10.0745)

4. DENTAL HEALTH

Due to the acidic burial environment, dental enamel was brittle and often fragmented. This meant that whole teeth were rarely available for study. Where part of any surface of a tooth was missing that tooth was not included in analysis of pathological conditions such as carious lesions, unless clear corresponding lesions could be identified in the alveolar bone. However, teeth were often found loose, hindering the investigation of alveolar involvement in dental pathologies. Recording of dental pathology was also affected by limited cleaning in many cases due to fragile enamel, likely obscuring certain conditions such as hypoplasia. Calculus was also likely to be affected by poor preservation, as its presence was only noted in a handful of individuals and was often loosely attached to the tooth surface. Rates of periodontal disease (inflammation of gums leading to resorption of alveolar bone) were similarly obscured, by the taphonomic erosion of bone around the alveoli.

Figure 12: A carious lesion with extensive enamel destruction on a molar from SK10.1709

Teeth were present in 59 individuals, but many of these only had one or two loose teeth with fragmented enamel. The count of complete teeth with minimal to no enamel fragmentation available for study was 420. This is approximately 11% of the total teeth which would be expected for complete preservation of 119 adults (not considering those juveniles of mixed dentition). Dental pathology was recorded in 8 individuals (14% of individuals with teeth), including antemortem tooth loss, carious lesions, periapical cavities, and enamel defects such as LEH. Antemortem tooth loss was recorded in three individuals, all associated with periapical cavities (10.0762, 10.1397, 10.1709). in total, seven teeth from five individuals had evidence of carious lesions (10.0997, 10.1317, 10.0762, 10.1397, 10.1709). This rate of caries is low (1.7%), but it is possible that affected teeth were more susceptible to erosion in the burial environment having already been subject to pathological enamel destruction. Agriculturalists with high carbohydrate intake are expected to have caries prevalence rates over 7% (Davidson 2009), indicating a lower carbohydrate diet than expected (this will be further investigated through the programme of isotope analysis).

Figures 13 and 14: Periapical cavities and antemortem tooth loss in skeletons 10.0762 (left, a possible male over 40 years of age) and 10.1397 (right, a female aged 33-35).

Alveolar resorption as a result of periodontal disease was identified in one individual, SK10.1397, which also displayed antemortem tooth loss. Periodontal disease is a major cause of tooth loss along with caries and abscesses (Roberts and Manchester 2010) but can be difficult to discern in archaeological material. It is often diagnosed through increased distance from alveolus to the cemento-enamel junction (CEJ), though this can also be due to continuing eruption to compensate for high attrition (unlikely in this individual). Where diagnosed in this assemblage it is accompanied by visible inflammatory response, for example pitting and certain areas of new bone formation (Roberts and Manchester 2010). Calculus is a predisposing factor for the development of periodontal disease, but this was either not present or not surviving in this assemblage.

The ages of individuals with caries and antemortem tooth loss show this is unlikely to be age related, with 3 out of 5 likely not older than 25. One older individual (SK10.0762, a possible male aged between 33- 55) displayed antemortem tooth loss, as did one female aged 33-35 (SK10.1397, see figure 14).

ANATOMICAL VARIATION AND NONMETRIC TRAITS

Variations in skeletal assemblages are usually recorded to help characterize a population or an individual. Some variations may be interpreted due to their rare occurrence as an indication that individuals are from the same family (genetic), while others appear commonly and occur sporadically. Traits can be hyperostotic, i.e. associated with abnormal bone growth, or hypostotic, which is associated with ossification failure. Other traits which do not fall into these categories include ossicles of the cranial sutures and variation in foramen number and location. Numerous such variants are present on the human skeleton and there is debate over which are informative in terms of genetic links or population variation. Analysis focused on the standard non-metric traits recommended by Buikstra and Ubelaker (1994). Dental variations were recorded with reference to the Arizona State University Dental Anthropology System.

Several anatomical variations were observed. Unfortunately, analysis of their prevalence was limited by the preservation state of the assemblage. No variations were noted with higher rates of occurrence than in one individual.

Individual	Type of variant
10.0348	Metopic suture
10.0745	Nuchal foramen
10.0807	Wormian bones
10.1109	Enamel pearl
10.1221	Squatting facets
10.1397	Coracoclavicular joint, mandibular torus
10.0741	Acetabular crease
10.0348	Supraconyloid process
10.0516	tuberculum dentale, Cruciform eminence variation
10.2921	Carabelli's cusp

Table 9: Non-metric traits of the Wylfa Head assemblage

A retained metopic suture was recorded in SK10.0348, which occurs along the sagittal midline of the frontal, from the *glabella* to the coronal and sagittal sutures. This suture normally closes during childhood, but it can be a relatively common find in adults. Although it has been suggested that it results from abnormal growth of the cranial bones, hydrocephalus, heredity, or atavism, the genetic factor is the one currently accepted by most scholars. Unfortunately, there is no evidence for this variation in any other individual, precluding any exploration or suggestion of affinity.

Figure 15: Metopic suture of the frontal bone, SK10.0348

An unusual variation was recorded on the left second maxillary molar of SK10.1109. This was a rounded mass of enamel (figures 20 and 21) on the mesiolingual aspect of the tooth root, adjacent to the cemento-enamel junction (CEJ). It is connected by a slight enamel extension to the crown with dentine visible at the surface of the enamel sphere, indicating that dentine is present internally. Enamel extensions and associated pearls are included in the ASUDAS trait system (Scott 2017), but typically take a different form than that observed here, occurring in the groove or bifurcation between roots. However, biomedical literature has cited cases occurring on the CEJ rather than in the bifurcation between roots (Fuentes et al. 2017), as in this case, and in other places of the root such as on the lingual aspect of a mandibular central incisor (Sharma et al. 2013). It seems likely that this example constitutes the same trait as that termed an enamel pearl. It has also variously been termed an enameloma, enamel pearl, droplet, or globule. They are frequently located in maxillary molars, as here, but their size and location is variable. Three types of enamel pearls have been described in the literature: true enamel pearls, which are composed of enamel only; composite enamel pearls, which contain a core of tubular dentine; and enamel dentin pulp pearls, which contain a pulp horn that may be an extension from the pulp chamber or root canal. The pearl observed in SK10.1109 appears to be a composite pearl as the dentine part of structure is clearly visible. The prevalence of enamel pearls is variable, ranging from 1.1% to 9.7% between populations (Fuentes et al. 2017). Such an anomaly may facilitate the progression of periodontal breakdown, but this was not observed to any major extent in this case.

Figures 16 and 17: Enamel pearl on left second maxillary molar of SK10.1109

A small mandibular torus was recorded in SK10.1397, the same individual presenting a coracoclavicular joint (see below). A mandibular torus is a bony outgrowth located on the lingual side of the dental arch, in the canine or premolar region, above the attachment of the mylohyoid muscle. In most cases, bilateral tori are present, however the other half of the mandible was missing in this individual. Tori can also occur on the maxillary dental arch and are usually asymptomatic. Their prevalence varies substantially between ethnic groups, with higher prevalence in Asian and Inuit populations. They are thought to be caused mainly by environmental factors, such as bruxism, vitamin deficiencies and calcium-rich supplements, although genetic background also plays a key role (Mermod and Hoarau 2015).

Figure 18 and 19: Slight mandibular torus in SK10.1397, lingual view and occlusal view

The left clavicle of the same individual (SK10.1397) also presented an interesting non-metric trait. An additional joint was found on the inferior lateral aspect of the shaft. This is called a coracoclavicular (or conoid) joint or facet (Mann 2016), due to its articulation between the corocoid process of the scapula and the clavicle. Movements at the human shoulder girdle are the result of complex interplay of skeletal articulations. As well as articulating with the scapula and sternum, the clavicle is also connected to the first rib by the costoclavicular ligament and with scapula by coracoclavicular ligament. At times the area of attachment of these ligaments on the clavicle, first rib and scapula show faceted apophyses suggesting the presence of additional articulations. The coracoclavicular joint, as recorded in SK10.1397 and shown above, exists between the clavicle and coracoid process of the scapula (Rani et al. 2009). The coracoclavicular joint has been recognized as an uncommon osteological feature in most groups. The incidence of coracoclavicular joint is more common in Asians than in Europeans or Africans (Gupta et al. 2015). Research of 1,000 adult northwest Indians revealed this joint in 10% of males and 8% of females, but absent in foetuses, neonates and young children, suggesting it is not a congenital anomaly though its development may have a genetic component (Mann 2016). It is associated with increased frequencies of osteoarthritis in neighbouring joints, but unfortunately none were available in this individual for analysis.

Figure 20 (above): Inferior aspect of clavicle with coracoclavicular joint

Figure 21 (left): Anterior aspect of clavicle

A supracondyloid process of the humerus was observed in SK10.0348, a male aged between 25-35. This is a hook-like, bony spine of variable size that may project distally from the anteromedial surface of the humerus. In this case it is 0.5cm in length but can be up to 2cm (Shivaleela et al. 2014) and is roughly 5cm proximal of the medial epicondyle. The ligament of Struthers, which sometimes calcifies, extends from this bony "hook" along the medial border to the medial epicondyle. It is considered an uncommon finding (Mann 2016) and represents the vestigial remnant of climbing animals. It is still seen in many reptiles, most marsupials, cats, lemurs and American monkeys (Shivaleela et al. 2014).

Figure 22: Supracondyloid process in SK10.0348

Figure 23: acetabulum of SK 10.0471 showing anatomical variation

Sk10.0471 presented a nonmetric trait on a fragment of the left acetabulum of the pelvis. This triangular notch was located on the lunate surface, proximal to the acetabular fossa on the iliopubic side, approximately 1.5 x 1.5 cm in extent. This appears to be a variation of the trait known as an acetabular crease, which is a typical anatomical variant (Mann 2016). The acetabular crease appears to be a stable anatomical trait throughout adult life, with no predominant side and no correlation with sex. Variability of its occurrence between populations could be linked to greater biomechanical stress during childhood (Mafart 2005). The size and extent of the trait in this case is unusual, possibly it is closer to what (San-Millán et al. 2017) describe as an elongated lobe of the acetabular fossa than a true acetabular crease.

Figure 24: Squatting facets on distal tibia fragment in skeleton 10.1221

Squatting facets were clearly observed in one individual (SK10.1221), and possibly in a second though this is unconfirmed due to taphonomy. Squatting is a resting posture that involves hyper-flexion at the hip and knee joints, and hyper-dorsiflexion at the ankle and subtalar joints. The effects of squatting stress may induce bone remodelling in the form of facets at the distal tibia and talus articulation. In this case only the tibia was observable. Different incidences of these modifications can reflect the lifestyle of a population. They are common in modern Aboriginal Australians and Indians, and research of 13th century Europeans demonstrates their rates were higher in past European populations (Ari et al. 2012).

DISARTICULATED REMAINS

21 small finds consisting of fragments of human bone were sent for analysis, representing disarticulated material from non-grave contexts. One of these was confirmed to be animal, and several had been assigned both small find numbers and skeleton numbers but were in fact from grave contexts. These are in red in Table 9 (page 30) and were analysed as part of main assemblage. This left 13 contexts to be analysed as disarticulated remains. Where possible, skeletal fragments were identified. Investigations then proceeded to determine the minimum number of individuals (MNI), age and sex. This was extremely difficult, due to preservation state and completeness. A significant portion of the assemblage was small fragments of burnt bone, some which may be animal but are too small to clearly identify. Considering disarticulated material as a whole, there are at least two individuals represented, as evidenced by the duplication of some teeth and skeletal elements. This brings the MNI for the site to 121.

Also represented among the disarticulated remains are other cranial fragments, long bone fragments, and a left and right femur possibly belonging to the same individual from the same context. No metrics or non-metrics were recorded within the disarticulated material, nor were any features related to sex or stature. Though some age data was available from dental evidence, including the teeth of a young adult. Taphonomy of the disarticulated material was consistent with the burials, including soil staining, cortical erosion, and post-mortem fragmentation.

REMAINS RESULTING FROM SAMPLE PROCESSING

Bone from sample processing of graves was also received by Cardiff University on the 20th November 2019. Animal bone and teeth were included, which have been separated for analysis by a zooarchaeologist. The identifiable fragments of human bone and teeth were weighed and analysed (where possible), and this information has been added to individual skeleton summary entries in Appendix 2. The combined weight of human remains resulting from soil samples in graves was 103g.

In some cases, the bone deriving from grave soil samples was burnt where the individual in the burial was not. These have not been included with the summaries as they are unlikely to be from the inhumed individual(s) in the grave. It is probable that these small fragments of burnt bone are animal rather than human cremated remains (disturbed or otherwise) due to the lack of charcoal in grave fills. The combined weight of this burnt material is 30g.

The remains from sample processing of graves resulted in some additional individuals being added to the MNI for cemetery as they were from graves recorded in the field as having no surviving human remains. Additional individuals are listed below and included in the main analysis in the body of this report. They are also included in skeleton summaries in Appendix 2.

Skeleton #	Grave #	TNOF	Preservation	Completeness	Age	Sex
SK10.2925	G44	16 teeth	n/a	poor (5-25%)	17-25	indeterminate
SK10.2923	G52	1 tooth	n/a	<5%	indeterminate	indeterminate
SK10.2924	G183	5 teeth	n/a	<5%	17-25	indeterminate

Table 10: Additional individuals resulting from grave soil samples

Table 11: Disarticulated remains

SF#	Context#	Identified fragments/description	Taphonomy/post-mortem modifications	Demographics	Notes
171	F296	Two fragments of long bone	burnt		
255	(10.0521)	Fragments less than 10mm			
293	(10.0529)	Ulna/radius midshaft, not sideable			
294	(10.0529)	Left and right femora	Soil staining, post-mortem breakage		
304		Femur fragments, not sideable	Surface erosion		
356	(10.0529)	Distal left tibia	Weathering/drying cracks	Aged 14+	
357	(10.0529)	Fibula midshaft	Post-mortem breakage		
389	(10.2199)	Upper second or third molar		Slight wear, young adult	
391	(10.2311)		burnt		
424	(10.0009)		burnt		
558	(10.1835)	Fragment of right(?) petrous temporal	Surface erosion		
661			burnt		
837	(10.1601)		burnt		
1143	G.233	Skull fragment	burnt		Likely from individual 10.2920, burnt cranial remains in G233
1149	(10.0030)		burnt		
1182	SK10.0851	Unidentifiable trabecular bone fragments			Articulated skeleton in G268, see appendix 2

1204	(10.0499)	Endocranial fragment, ectocranial surface not surviving.		Possible juvenile?	
1216	SK10.0851	Cortical bone fragments, possibly cranial	Surface erosion		Articulated skeleton in G268, see appendix 2
1220	SK10.0612	Unidentifiable, labelled left femur fragments			Articulated skeleton in G.146, added to main analysis (see appendix 2)
1221	SK10.0612	Right petrous, right maxilla, 11 teeth			Articulated skeleton in G.146, added to main analysis (see appendix 2)
1222	SK10.0612	Labelled R femur frags, v poor condition			Articulated skeleton in G.146, added to main analysis (see appendix 2)
1223	(10.0001)	Unidentifiable fragments (possibly animal bone)			
1224		Left proximal tibia		Age 14+	
1225	SK10.0851	Femur shaft (labelled as left from contextual info but not sideable osteologically)	Weathering		
1422					
1446	(10.0001)	Animal bone	Butchered?		
1914	(10.2442)	Upper permanent molars		No/slight wear	

DISCUSSION

There are more than 100 recorded locations of Early Medieval burials in Wales (Longley 2009), with more cemetery sites discovered annually. However, of the cemetery sites which have been excavated, only a handful contained any surviving human bone. The only sites providing substantial comparative osteological data are Llangefni and Tywyn y Capel, both also on Anglesey, Llandough (Vale of Glamorgan), and Brownslade (Pembrokeshire). A further two significant cemeteries have been recently been excavated but analysis is ongoing and results are not yet available. These are St Patrick's (Pembrokeshire) and Five Mile Lane (Glamorgan).

The Wylfa Head cemetery is unique in North Wales due to its size. In the rest of the country only one fully excavated site contains more burials; Llandough, excavated in 1994. Llandough is a large monastic site with 1,026 inhumations (Holbrook and Thomas 2005), in use from at least the mid-7th century up to late 10th or early 11th century. This site is therefore very different in character to Wylfa Head, where no church or ecclesiastical remains are evidenced. It is possible that the Tywyn y Capel cemetery site, on Holy Island, was a similar size to Wylfa but the site has been much affected by coastal erosion and it is likely that many burials have been lost. Most recent excavations there revealed 124 burials, in use between the 7th and 13th centuries (Davidson et al. 2009). Llangefni, excavated in 2016 and 2017, contained the remains of 82 individuals with relatively good preservation for the region. This cemetery was excavated in two parts by different archaeological units, so the data discussed is synthesised from both osteological reports (Rusu and Madgwick 2017; Faillace and Madgwick 2018). Brownslade represents the largest assemblage of Early Medieval burials in west Wales with a total of 32 human burials (Groom et al. 2012), though the area has not been fully excavated and it is likely to contain more graves.

A mix of grave types, from fully stone-lined and capped to simple dug graves, is evidenced at all these sites, though the proportions differ. At Wylfa Head the majority contained some form of stone lining and/or capstones, with 48 graves being earth-cut with no cist. Llangefni has 23 earth cut, and 57 cist graves with or without capstones. Other sites have a majority of dug graves: at Tywyn y Capel (Davidson 2009), 19 were cist burials and 103 were non-cist graves dug into the sand. The cemetery at Brownslade contained 12 cists and 14 earth cut graves dated to the 8th century AD (Groom et al. 2012), and the excavation of Llandough revealed 16 cists and 1010 earth cut graves dated to the 4th to 12th centuries (Holbrook and Thomas, 2005). At some sites this represents chronological difference, though it depends on the site whether cist graves are the earlier or later phase.

Within many sites, cist burials are better preserved. The cist burials at Tywyn y Capel were also generally well-preserved, whereas the simple burials appeared to be more polarized, either presenting a very good preservation or a fairly poor one (Adlam and Wysocki, 2009). At Llangefni preservation was better in the cists that contained capstones (Rusu and Madgwick 2017), which mirrors preservation at Wylfa Head where only one dug grave contained any human remains. At Llangefni it was noted that the long bones (e.g. femur, tibia and humerus) were most likely to survive, and skulls were normally recorded as being highly fragmented. This is the same pattern evidenced at Wylfa Head though the condition of the bone here is much poorer, as only the long bone shafts and very rarely any joints or epiphyses survive.

Due to the poor preservation at Wylfa, conclusions about demography and pathology distribution were tentative. Sex data from Wylfa head was extremely poor, resulting in only 1 male and 1 female, as well as 4 possible males and 3 possible females. Other sites have revealed patterns in age and sex data which were not identifiable here. Of all individuals from both excavations at Llangefni, 50 were sexed, resulting in 13 males and 27 females. The authors have suggested that differential burial practice should be considered as a factor here (Rusu and Madgwick 2017). This larger proportion of females is slightly paralleled at Tywyn y Capel in the earlier cist cemetery. Of the adults, seven were identified as female, two were identified as male, and one was unknown. It is noted here that this could be artefact of chance survival as only a fraction of the original cist cemetery survives (Davidson et al. 2009), but this may indicate that females were clustered in a specific area. In south Wales sites, sexes were more balanced. At Llandough, 30% of the individuals were determined to be either certainly or probably male, while 25% were certainly or probably female. At Brownslade, 33 of the 52 skeletons were sexed, resulting in 16 males and 17 females.

At Wylfa Head, tentative age ranges could often only be based on one proxy, namely dental attrition. While this precludes any definite conclusions about age-at-death ranges in the population, enough of a sample was aged to draw some comparisons to other cemeteries. Llangefni had better survival of infant remains with two perinates and infants under 2 years; neither age category was represented at Wylfa Head. The larger proportion of individuals (n=26) were aged between 26 and 45, while at Wylfa Head the largest group (n=19, 36% of aged individuals) were those between 18-25. The age distribution of the cist burials at Tywyn y Capel include more non-adults (24 long cist graves containing 10 adults and 12 subadults), however, they are all children under the age of five. The lack of 12-18 year olds has been described by the authors as not representative of mortality rates, so it is possible that they were buried elsewhere (Davidson et al. 2009). The non-cist burials from Tywyn y Capel had a very different mortality profile, with 42% of the sample being non-adult.

At Brownslade, few deaths occurred in the youngest age categories (first months – 2 years), when compared to the total number of sub-adults recorded (Coard, 2012, 150). Coard (2012) notes that the mortality rate falls for the twelve to eighteen-year-olds and then rises for the adults, and believes probable causes relate to specific periods of stress (diet) or a demanding lifestyle.

Age Category	Wylfa Head n (%)	Llangefni n (%)	Tywyn y Capel n (%)	Brownslade n (%)	Llandough n (%)
Foetus	0	0	0	0	6 (1%)
Perinate	0	3 (5%)	1 (5%)	0	13 (2%)
Neonate	0	1 (2%)	8 (42%)	2 (4%)	
Infant	0	0		4 (9%)	46 (6%)
Young Child	0	0		12 (26%)	48 (6%)
Older Child	6 (11%)	5 (8%)	0		55 (7%)
Adolescent	5 (9%)	3 (5%)	0	2 (4%)	30 (4%)
Young Adult	19 (36%)	9 (15%)	4 (21%)	7 (15%)	87 (11%)
Middle Adult	12 (23%)	15 (25%)	3 (16%)	4 (9%)	127 (16%)
Mature adult	4 (8%)	13 (22%)		8 (17%)	102 (13%)
Old Adult	1 (2%)	7 (12%)	3 (16%)	7 (15%)	109 (14%)
Non-adult	0	1 (2%)	0	0	0
Adult	6 (11%)	3 (5%)	0	0	150 (1%)

Table 12: Age-at-death distributions from comparative sites. Data for Tywyn y Capel cists, Brownslade, and Llandough reproduced from Faillace and Madgwick (2018), after (Loe and Robson-Brown 2007; Adlam and Wysocki 2009; Coard 2012)

During analysis, it was considered unlikely that the higher proportion of burials in the young adult age category was a true reflection of mortality rates in the community using the Wylfa Head burial ground, and instead represented a methodological bias or perhaps selective burial. Given the patterns of preservation discussed previously, i.e. that burials in capped cists preserve better, it may also be possible that this burial type was more common among the young adult age category. If the cemetery represented a complete population with full survival of skeletal remains (which is never the case in archaeology), the distribution could be expected to show higher deaths for the very young and the old (Waldron 1994). However, the survival of neonate and infant remains is generally very poor. As we can see, age-at-death distributions from other sites tend to show more deaths in

the middle adult and older age categories, apart from the Tywyn y Capel cist group which was predominantly children under the age of 5, with young adults the next highest proportion.

Few pathological changes were identified in the Wylfa head assemblage. Those that were observed were related to non-specific stress (cribra orbitalia, linear enamel hypoplasia), and degenerative joint disease (porosity, osteophytosis). At Llangefni, 7 individuals were affected by cribra orbitalia, two of whom were children between 8-10. This roughly tallies with the 10% rate of cribra orbitalia from Wylfa Head. Cribra orbitalia was identified in two individuals from Brownslade (2/52, 3.8%), and 138 at Llandough (138/385, 35.8%). At Llandough, investigations of juvenile morbidity have revealed that from the sub-adult skeletons with orbits present, 46/62 (75%) exhibited cribra orbitalia. If the stress is occurring during childhood it is likely that cribra orbitalia would have healed by adulthood, explaining the lower rates in those groups, but it is also possible that they indicate general ill-health in children who died young, and those who survived into adulthood may not have been under similar stress. No features of metabolic or endocrine illness were observed on the remains from Tywyn y Capel. Linear enamel hypoplasia was recorded on 8 out of 71 individuals with teeth at Llangefni, a rate of 11%. The same condition was present on three individuals from Brownslade (3/52, 5.8%) and 57 individuals from Llandough (57/551, 10.3%). At Wylfa Head the rate was much lower (0.5%). The greater percentage of linear enamel hypoplasia at other sites is likely an artefact of poor preservation at Wylfa Head, where teeth were in a fragmentary condition.

Only two cases of possible degenerative joint disease were identified at Wylfa, due to poor survival of vertebrae and epiphyses. The prevalence of degenerative joint changes was higher at Tywyn y Capel, with 70% of the adult sample affected. At Llangefni evidence of joint disease was present in 20 of the adult (n= 65) individuals, a rate of 31%. The vertebral column was most commonly affected, while shoulder and hip joints were also affected. Llandough had an adult prevalence of 32.8% for osteoarthritis.

Enthesophytes, like those of the linea aspera of SK10.0745, were recorded on four individuals in the Llangefni assemblage, on the calcaneus, patella, and other areas (e.g. long bones) (Rusu and Madgwick 2017). One case displayed both enthesophytes and marginal osteophytes, suggesting these changes may be the result of aging. One case of large enthesophytes on the patella was thought to possibly be the outcome or some form of repeated activity or trauma. At Brownslade, preservation allowed for detailed analysis of musculo-skeletal markers of the upper limbs in four individuals, which was not possible in the Wylfa Head assemblage. The individuals were two males and two females, and a range of measurements were taken to assess asymmetry and robusticity (Coard 2012). Robusticity indices indicated strenuous activity especially in one individual (S532).

This, along with bowing to the upper limb bones possibly indicating strenuous arm movement, was concluded to indicate a severe pattern of use and very strenuous lifestyles, though there was some differences between the sexes.

There was greater evidence for dental pathology at Wylfa Head, due to the preferential survival of teeth. However, the enamel of many teeth was fragmented, and the rates of pathologies are certainly an underestimate. Dental pathology (including LEH) was recorded in 8 individuals (14% of individuals with teeth). Antemortem tooth loss was recorded in three individuals in the Wylfa Head assemblage, all associated with periapical cavities. In total, seven teeth from five individuals had evidence of carious lesions. This rate of caries is very low (1.7%) when compared with other sites. At Llangefni, 11 individuals had evidence of carious lesions of the 71 individuals which had dentition (15%). Ante-mortem tooth loss was also present at Llangefni, in 13 out of 71 individuals (18%). The low rates of calculus observed at Wylfa Head contrast strongly with Tywyn y Capel, where calculus was present in approximately one-third of teeth (Davidson et al. 2009), but this is due to preservation issues rather than being representative of oral health.

Examination of any correlations between grave location and age, sex, and/or non-metric traits was mostly unsuccessful. The ability to age and sex individuals was so heavily influenced by preservation that any patterns in grave location that may be visible would be highly misleading, being instead representative of the survival of osseous material rather than patterns of deliberate burial. In terms of possible genetic links between individuals, the lack of any repeated non-metric traits which may be indicators of affinity precluded investigations. However, there are other methods to investigate this which were not within the remit of this analysis but may be possible in the future, for example biological distance and aDNA analysis (which will be discussed below).

RECOMMENDATIONS FOR FURTHER ANALYSIS

Osteological analysis of the Wylfa Head skeletal material has identified some isolated pathologies, as well as non-metric skeletal traits, but with poor preservation it is not possible to draw conclusions on distribution patterns. Despite the MNI of the assemblage being among the largest in Wales, nearly half of those individuals consisted of less than 5% completeness and were in poor states of preservation. However, the importance of the assemblage cannot be disputed, so chemical analyses of a large number of individuals to investigate patterns across the site are strongly recommended. The collection is well-suited to destructive analysis as it contains many undiagnostic fragments which otherwise provide little information. aDNA analysis can be utilised to explore relationships between

individuals buried in different areas of the cemetery. Isotope analysis for diet and migration will answer questions which were not answered based on macroscopic investigations of skeletal remains.

Radiocarbon dates have now been returned for 8 individuals. The results are clustered quite closely in date despite being taken from diverse areas of the cemetery (as recommended in Appendix 1 the osteological assessment report), suggesting a potentially quite short period of use from about the mid-5th to mid-7th centuries. This is very interesting given the size of the cemetery. More samples will be needed to confirm this, but these preliminary results suggest a comparatively early date of use and abandonment. Llangefni appears to be slightly later as most dates fall in the 6th-8th centuries (ABA, *pers. comm*.), but with apparently greater range than at Wylfa Head. Tywyn y Capel was reportedly in use from the 7th-13th centuries. Other cemeteries on Anglesey with minimal or no bone surviving are poorly dated. To gain further clarity on the development and period of use of Wylfa Head it is recommended that retest of failed dates be carried out, as well as on at least 10 more individuals. Future analysis should align with The Research Framework for Early Medieval Wales (Edwards et al. 2016). The link between "Christian" cemeteries and earlier prehistoric sites, the date of abandonment of undeveloped cemeteries such as Wylfa Head, and the date and development of cist graves are all cited as priorities. This exploration of cemetery development and use over time is one of the key research questions posed at assessment stage, and Wylfa Head is in a unique position among the cemeteries of Anglesey to investigate this, as it may represent one of the earliest large cemeteries in Wales. Dating resolution is often a problem in Early Medieval Welsh cemeteries so enhancing chronological resolution should be a priority. This information has the potential to broaden our understanding of other sites of the period where no bone survives.

This data would benefit substantially if combined with a comprehensive programme of aDNA and isotope analysis. Sex data can be obtained through aDNA analysis, for both adults and juveniles, allowing the examination of patterns of burial which may be present. As previously discussed, females were more represented than males at comparable sites on Anglesey, so this element is an important one. aDNA analysis could also investigate origins as well as genetic affinity of the population. Burial in family plots is cited as a possible factor of Early Medieval burial in Wales (Britnell et al. 1990; Brassil et al. 1991; White and Smith 1999), and the presence of double burials at Wylfa Head may support this. Potential evidence of biological relatedness and population affinity from aDNA analysis will be key to exploring this. As the petrous portion of the temple is the mostly likely to contain aDNA, it is estimated that 30 individuals will be available for analysis.

Hemer et al (2013) suggest that archaeological evidence points towards a connection between western Britain and the Mediterranean world after the fall of the Roman Empire. This relates to finds from Llandough, in the form of nine fragments of pottery, all belonging to the Eastern Mediterranean B2 amphora form, which was usually made along the southern coast of Asia Minor. In addition, isotope analyses suggest a Mediterranean/Continental European origin for two individuals from Brownslade (Coard 2012). Individuals buried at Llanbedrgoch were identified as spending childhood in North West Scotland or Scandinavia: originally thought to be victims of Viking raiding, which began in the 850s, this interpretation is now being revised through stable isotope analysis by Dr Katie Hemer of Sheffield University. At Tywyn y Capel, two individuals may have spent their childhoods in areas such as in Northern Scotland or Norway (Matchett 2011), and one yielding the lowest strontium ratio is indicative of upbringing in only one place in the North Atlantic, namely Iceland. At Llangefni great diversity of origin around the UK and further afield was suggested as a possibility for a large proportion of individuals. When the results from both excavations are considered together, 12 are likely from warmer climates, while two are likely from cooler climates (Faillace and Madgwick 2019; Rusu and Madgwick 2019), although caution must be exercised in the interpretation of oxygen isotope data.

As migration is a key theme in studies of Early Medieval Wales, strontium ($^{87}Sr/^{86}Sr$) and oxygen ($\delta^{18}O$) isotope analyses are recommended, which can be supplemented by sulphur isotope analyses. Strontium isotope analysis provides a signal reflecting the local geology where an individual was raised, while oxygen provides a climatic signal. Analysis should focus on permanent dental enamel (preferably M1), as this is resistant to diagenesis and provides a snapshot for early life origins as, unlike bone, enamel does not remodel after development. Unlike DNA, which would not distinguish the migrant from their descendants, strontium isotope analysis will identify only first-generation settlers. It is however recommended, that aDNA analysis be undertaken and conducted on the same individuals that are analysed for provenancing isotope analysis. Analysis would be useful for assessing population homogeneity at Llangefni and potentially for establishing origins, whether ancestral or first generation. It is recommended that 100% of the available individuals (i.e. those with first molars present) are analysed for strontium and oxygen. This is roughly 30 individuals. Results may be particularly interesting in the case of SK10.1397, which presented two non-metric traits with a low rate of occurrence in European populations

$\delta^{13}C/\delta^{15}N$ isotope analysis of bone collagen is optimally suited to address issues of diet. It is recommended that $\delta^{13}C/\delta^{15}N$ analysis be performed on all individuals. This analysis requires a substantial dataset for interpretation, is relatively cheap and does not necessarily entail the removal

of large samples. Small fragments (c. 0.5g) of bone would suffice. Due to improvements in instrumentation, smaller samples can be measured, allowing even the analysis of incrementally-forming tissues such as primary dentine which form and mineralize at a regular rate and do not remodel, thus recording the isotopic values from the diet during the period of formation. The investigation of diet and mobility afforded by isotope analysis, when performed on securely dated individuals allows the potential exploration of these aspects over time.

CONCLUSIONS

The importance of this assemblage to our understanding of Early Medieval Wales cannot be overestimated. The Wylfa Head cemetery site is invaluable in terms of its size and potential of use by multiple communities. Due to the poor preservation hindering meaningful demographic and pathological analysis, it is even more important that alternative means to learn about the community (or communities) using the Wylfa Head burial ground are utilised. The rarity of human remains from this part of Wales and the important archaeology of the site due to its size and organisation means that all possible avenues to discover more of the site, and therefore the burial archaeology, health, and lifeways, of the people of Early Medieval Wales, must be taken. The material represents a key element in understanding the Early Medieval population in Wales. With current osteological evidence available and future analysis underway, results will strengthen our understanding of demographics and health in this period.

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2019

Osteological Assessment Report

WYLFA HEAD AB1703

CIARA BUTLER

Prepared for:

Archaeoleg Brython Archaeology

Cardiff University BioArchaeology (CUBA)

1. INTRODUCTION

During a phase of evaluation trenching in 2016, an Early Medieval cemetery was identified at Wylfa Head. The works were carried out in advance of an application to construct the proposed Wylfa Newydd nuclear power station. The Wylfa Head excavation area was located to address the archaeological potential of these remains and excavated by Archaeoleg Brython Archaeology (ABA) in 2017-18.

The Early Medieval cemetery identified at the evaluation stage was discovered to consist of over 300 graves. The scale of the cemetery was unprecedented, being the largest of this period excavated in north-west Wales. Preservation at Wylfa Head was generally poor, but the scale of the cemetery means that a sizable assemblage was recovered. The area of excavation was extended when a Romano-British settlement was identified. In total an area of 5525m^2 was excavated, in which prehistoric activity was also evidenced.

This assessment focuses on the human remains recovered from Wylfa Head. The purpose of the assessment report is to:

1. Produce data relating to the quantity, nature, and condition of remains.
2. Determine importance of the assemblage and whether further study is required.
3. If required, recommend further analyses of the assemblage including estimated costs and timescales.

2. SITE BACKGROUND

As mentioned above, the Wylfa Head site comprises activity from multiple periods. The earliest activity at the site is likely to be represented by a flint scatter dating to the Mesolithic period, and a Neolithic pit which contained three stone axes and a cache of small polishing stones. The Romano-British settlement evidenced both domestic and industrial activity, and appeared to have evolved through a series of phases, possibly starting as an open settlement during the Iron Age and becoming enclosed by substantial wall during the Romano-British period (Hudson et al. 2018).

The Early Medieval cemetery contained over 300 graves, most of which were stone lined and capped long-cist types. A dense concentration of graves (F296) in a prominent position on the site appears to have been a focus of funerary activity. This feature provides evidence for re-use of a possible Iron Age roundhouse, the posts of which surround the graves of F296 and are in some instances cut by them. The presence of an initial focal point which must have held some significance has been noted

in other cemeteries of this period in Wales (White and Smith 1999), and the reuse of earlier monuments is a well-documented aspect of Early Medieval burial in Britain (Bradley and Williams 1998).

3. BURIAL DESCRIPTION

A total of 314 graves were identified, most of which were cut into the natural bedrock. Based on dimensions 28 were of a size which would have accommodated neonates/infants, 37 juveniles, 216 adults, and 31 were unknown due to truncation. Two were double graves. The majority of the graves had some form of stone lining: six had capstones only, 72 had side stones, 175 had cap and side stones, nine had side, cap and base stones, two had base stones only, one had base and side stones and one had capstones and two layers of side stones. 48 were earth cut with no surviving cist structures.

Orientation in the cemetery was generally E-W with head to the west, although in some areas rows of graves are oriented closer to NW-SE, possibly due in part to the topography of the site. There are some indications that standard orientation was sacrificed for proximity to F298.

Based on physical relationships there were four identifiable phases of burials within area F296, evidenced by G246 which cut G245, which in turn cut G259 which cut G238. A number of graves showed no physical relationships with any others, therefore it was not possible to associate these with a phase of activity. Outside of area F296, cemetery was generally well organised with distinct groups and rows which probably formed organically based on the visibility of existing graves. The majority of the cemetery extended downhill to the east and south from F296 with a few exceptions lying to the west.

4. RECOVERY AND METHODOLOGY

The excavation of human remains was undertaken in accordance with the *Guidance for Best Practice for Treatment of Human Remains Excavated from Christian Burial Grounds in England* (English Heritage 2005). 100% of all graves and cists were excavated by hand and all grave fill retained. In-situ human remains were recorded using photogrammetry and lifted, in a block if necessary. Remains were removed from site and dry-cleaned using bamboo sticks and brushes and archived at the ABA offices. The material was then transported to Cardiff University Bioarchaeology lab where assessment was undertaken by Ciara Butler (PhD Candidate, ABA), under the supervision of Dr

Richard Madgwick (Senior Lecturer in Archaeological Science). This involved rapid scanning of material for initial characterisation of the resource. Full quantification, demography, and analysis of pathology was not undertaken at this stage as the aim of the assessment is to provide recommendations for further analysis.

All human remains were assessed in accordance with *Human Bones from Archaeological Sites: Guidelines for producing assessment documents and analytical reports* (English Heritage 2004). *Guidelines to the Standards for Recording Human Remains* (Brickley and McKinley 2004) and *Updated Guidelines to the Standards for Recording Human Remains* (Mitchell and Brickley 2017) were also consulted at this stage.

5. SKELETAL ASSEMBLAGE

A total of 109 individuals from grave contexts have been subject to osteological assessment. Additionally, the assemblage includes 29 fragments of disarticulated remains from various contexts. These will affect the minimum number of individuals (MNI) estimation calculated at the recording phase of the analysis. The overall condition of the osteological material has been assessed through macroscopic examination only.

COMPLETENESS

Each skeleton was categorised as 'poor', 'fair', 'good', or 'excellent' depending on their level of completeness. Nearly all skeletons recovered from Wylfa Head were less than 25% complete (Table 1), and no skeleton was classed as excellent (more than 75% complete). Teeth and cranial fragments (petrous portion) were the most likely elements to survive, along with femoral diaphyses in a fragmentary condition. Fragmentation and the loss of long bone epiphyses in the assemblage will hinder both stature estimations and age estimates based on epiphyseal fusion at the report stage. It will also affect the recording of degenerative joint disease. Os coxae were almost universally absent, which will negatively affect the potential of sex and age estimation, many methods of which rely on features of the pelvis. However, several intact crania were recovered from the site, enabling the future recording of dental attrition and cranial metric analyses.

Table 1. Preliminary assessment of skeletal completeness

	Percentage of completeness	Number of skeletons	Percentage of individuals
Poor	<25%	100	92%
Fair	25-50%	7	6%
Good	50-75%	2	2%
Excellent	>75%	0	0%

CONDITION

Surface preservation was assessed for a sub-sample (34%, or just over one-third) of the assemblage, according to English Heritage assessment guidelines (2004) regarding large sites of 100 burials or more. Cortical layer damage was scored from 1 to 5+ (*table 2*), after Brickley and McKinley (2004), with a score of 1 being optimal condition. This system provides a generalised indication of preservation; and encompasses taphonomic processes from range of agents such as weathering, abrasion, and erosion. The remains were analysed as complete individuals rather than by element in order to give an overview of the surface condition across the assemblage.

Table 2. Preliminary assessment of skeletal preservation

score	1	2	3	4	5	5+	n/a	total
n	0	0	6	9	11	8	3	37
% of sub-sample	0	0	16%	24%	30%	22%	8%	100%

Preservation was at the lower end of the scale, though quite variable throughout the sample, ranging from scores of 3 to 5+. No individuals were scored as lower than a 3, which is defined as "most of bone surface affected by some degree of erosion; general morphology maintained but detail of parts of surface masked by erosive action". In order to record palaeopathological conditions of the cortical surface, such as periostitis, a lesser degree of erosion would be preferential. A score of 5+ is equated to "extensive penetrating erosion resulting in modification of profile" (Brickley and McKinley 2004: 16).

Teeth were not scored according to this system as it records cortical surface damage. However, they were noted to be in poor condition generally with enamel fragmentation present in all individuals with dentition, even when dental arcades were complete. Many teeth were loose and without surviving maxillae or mandibles. Generally, roots of loose teeth were absent, and may have degraded with the alveolar bone. Fragmentation of teeth in this way may obscure dental calculus, carious lesions, or the presence of linear enamel hypoplasia.

***Figure 1*: Fragment of tibia with a surface preservation score of 5**

***Figure 2*: Right femur with surface preservation score of 3**

DEMOGRAPHY

Cursory age and sex estimates were recorded where features were obvious during assessment of the remains. In most cases sex could not be determined due to poor condition and fragmentation, however some may be able to be estimated under more thorough investigation.

Current age estimates for assessment level analysis merely classify the remains into cohorts of subadult or adult; precise ages were not estimated (table 3). Age classification, where possible, was based on epiphyseal fusion and dental eruption. In many individuals the absence of elements other than fragmentary long bone shafts precluded age estimation. It may be possible to assign rough age categories to some individuals recorded here as indeterminate on further investigation.

Table 3. Preliminary age classification

	Number of individuals	Total percentage of assemblage
Adult	36	33%
Subadult	2	2%
Indeterminate	71	65%

The extremely low instance of subadult remains in the assemblage is likely not reflective of the demographics of the cemetery, but rather due to the poor survival of juvenile remains. According to the rough estimates based on grave size, around 65 graves potentially contained subadults, or 21% of the total burials.

PALAEOPATHOLOGY AND TRAUMA

At assessment level, no detailed pathological analysis has been undertaken but brief observation has been made to guide recommendations for future analysis. Few pathological conditions have been noted during assessment, likely due to the poor condition of the remains. However, more thorough investigation at osteological analysis stage may identify further conditions. Potential instances of trauma requiring further investigation include a possible clavicle fracture, as well as evidence of musculo-skeletal stress in the form of enthesophytes present in several individuals (figure 3).

***Figure 3*: Robust humerus with enthesophyte on the medio-distal surface of the diaphysis**

6. POTENTIAL FOR FUTURE ANALYSIS

The analytical potential of this assemblage has been determined based both on the criteria above and the archaeological context of the burials and the cemetery itself. The Wylfa Head cemetery is one of the largest Early Medieval cemeteries excavated in Wales, and second in size only to the monastic site of Llandough in Glamorgan (Holbrook and Thomas 2005). This suggests use over a long period, probably by a wide section of society or possibly by members of several communities, allowing the exploration of questions relating to cemetery development and social identities. Full standard analysis is recommended based on the scale of the cemetery alone.

Although the state of preservation was poor, the value of this resource is amplified given that the material comes from an area where human remains rarely survive. Full analysis will make an important contribution to material from this period. Many cemeteries in northwest Wales produce no osteological data whatsoever, and to date on Anglesey only Tywyn y Capel (Davidson et al. 2009) and Llangefni (ABA and Archaeology Wales, forthcoming) have been available for study. However, these important sites are part of a growing corpus of Early Medieval skeletal assemblages in Wales, which include the recently excavated sites of St. Patrick's Chapel (Pembrokeshire) and Five Mile Lane (Vale of Glamorgan). Llangefni especially had relatively well-preserved remains for the region,

meaning that detailed analysis on the Wylfa Head material can be contextualised better than would have been possible a few decades ago.

The Research Framework for the archaeology of Early Medieval Wales (Edwards et al. 2016) indicates that the focus of osteological analysis should be origins, pathology and health, nutrition, and demography. The potential for the determination of age and sex is low due to poor survival of diagnostic elements. Estimations of sex will likely be based on characteristics of the cranium, and age based on dental attrition. These methods can be misleading when taken as indicators without the support of evidence for age and sex from other elements, as both are population specific (ref-standards/White). It is likely it will only be possible to assign broad age categories in most instances.

In terms of pathology and overall health, many of the lesions associated with conditions may not be visible in the assemblage due to the destruction of the cortical surface. Pathology refers to disease, and generalised health refers to the presence of non-specific stress indicators such as dental enamel hypoplasia, cribra orbitalia, and porotic hyperostosis. None of these conditions were noted at assessment level, but the fact that all skeletons recorded scored at least 3 for damage to the cortical layer must be borne in mind when interpreting the prevalence of pathologies. This is especially true in the case of mild or healed periosteal reaction. Dental pathology will more observable due to the better survival of teeth – for example, carious lesions, abcesses, and periodontal disease

Due to the poor surface preservation, it is instead recommended that the analysis of Wylfa Head material focus on exploring origins and diet though biochemical analyses. Questions of mobility, economy, and diet are central to research priorities for Early Medieval Wales (Edwards et al. 2011). Isotope analyses have been successfully implemented to reconstruct dietary practices and investigate individual place of origin in a number of sites in Wales (Groom et al. 2012; Hemer et al. 2013; Hemer et al. 2017), and the material from Wylfa will be a valuable addition to this growing corpus. Recent work from the Llangefni Early Medieval cemetery (Faillace and Madgwick 2019; Rusu and Madgwick 2019) has revealed a potential mix of origins from Wales and wider Britain, as well as possibly Scandinavia and the Iberian Peninsula. In light of these results, a programme of multi-isotope analysis for diet and provenance as used at Llangefni (see methodology below) is recommended.

Although archaeological evidence indicates an Early Medieval date, the paucity of dateable finds and lack of documentary evidence makes it difficult to narrow down to precise dates. The use of cists has been attested in Britain in the periods preceding the Early Medieval (Pollock 2005; Davis 2017), and in Gwynedd they have extended into later Medieval period (Edwards et al. 2016). The size of the

cemetery at Wylfa Head suggests a long use-period. In order to investigate questions of the site's development over time a clear chronology is required. Stratigraphy was often unclear as many graves in the wider cemetery area were evenly spaced and not intercutting, meaning little information could be gained on phasing with regard to these graves. Due to this, it is recommended that a sample of human remains are C14 dated to clarify the chronology of the site. This is important in terms of research value not just for Wylfa, but for our understanding of Early Medieval burial practices in a wider context. Dating resolution is often poor in Welsh cemeteries of the period where no bone survives, so obtaining secure radiocarbon dates where possible is essential.

The assemblage also presents an opportunity to investigate genetic affinity and population homogeneity. At assessment level several non-metric traits (figure 4) of the cranium and dentition have been noted, and full osteological analysis will include the recording of such traits. Such evidence can be analysed to explore population homogeneity. The presence of intact and partially fragmented crania allow for increased availability of this data. It is also recommended that aDNA analysis is undertaken to explore genetic affinity further. Such analysis has successfully identified family groups at Butt Road Roman cemetery, Colchester (Voong et al. 2017). Ancient DNA would also be a good complement to provenancing isotope research to address issues of origins and migration. Such questions can be investigated with regard to spatial organisation of the cemetery, or a clarified chronology based on radiocarbon dates could allow research into changing genetic affinity over time.

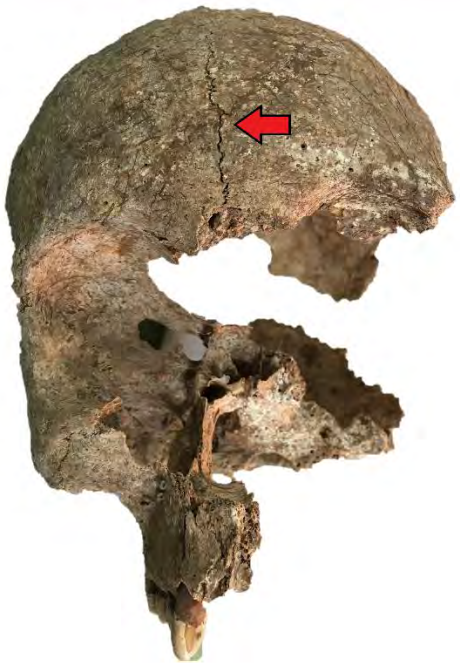

Figure 4: Metopic suture on SK10.0348

As recommended by the Research Framework for Early Medieval Wales (Edwards et al. 2016), detailed analysis of mortuary rites in the context of skeletal evidence should also form part of the final report. To get a better understanding of the occurrence of certain practices, Wylfa should be compared to contemporary sites both in northwest Wales and throughout the country in order to find parallels.

Focal features such as those represented by F296 are well attested in this part of Wales, and often take the form of square mortuary enclosures (Longley and Richards 1999). Such enclosures have been excavated Llanbeblig, Caernarfon (Kenney and Parry 2013), and Capel Eithin on Anglesey (White and Smith 1999) for example. While different in character, they exhibit the same clustering around focal areas of graves which could suggest links to family groups or status. The existence of these structural and organisational features of cemeteries are interesting in terms of social identities, whereby links to previously deceased people are emphasised in a community space.

The use of earlier monuments as a focus for burials, as has been suggested by the presence of a possible Iron Age roundhouse surrounding F296, is also a well attested feature of Early Medieval mortuary practice in Britain (Bradley and Williams 1998). On Anglesey it has been noted at Ty Mawr (Kenney 2001), Arfryn (White 1971) and Capel Eithin (White and Smith 1999). At Plas Gogerddan, Cardiganshire, both iron age inhumation and a small Early Medieval cemetery were associated with Bronze Age ring ditches (James 1992).

A few graves at Wylfa had evidence of reuse with schist slabs placed vertically across the grave towards the foot or head end. This may have been done to create an ‘annex’ to contain the remains of the original individual and re-use the original grave for a later internment. Evidence of this practice was identified at another early medieval cemetery at Llangefni, Anglesey (Brython Archaeology, forthcoming).

7. RESEARCH RECOMMENDATIONS

- Full standard osteological analysis and report focusing on the above research themes. This will be completed through macroscopic observation with no microscopic analysis necessary. X-rays may be used to identify possible cases of trauma or pathology.
- Radioacarbon dates of the following individuals should be obtained:
    - 2 from F296: G233 as it is one of the oldest, and possibly G230/G243
    - 1 from the graves to the west and south of F296 = G115, SK10.0620
    - 1 from the earlier graves on a different orientation in SW of the cemetery = G347, SK10.1741
    - 2 from G80 (instance of grave reuse), SK10.0749 and 10.0747

- 1 from possible well-organised square of graves SE of F296 (might represent later formalisation of the cemetery) = G100 SK10.0745
- 1 from the group near the southern boundary wall = G56, SK10.0931
- 1 from the deep graves cut through the Roman period remains = G33, SK10.1772
- 1 from graves respecting F296 to east = G368, SK10.2182

Radiocarbon dates should be obtained from at least these 10 individuals to begin with, with further dates possibly recommended based on the results of isotopic or aDNA analysis.

- Multi-isotope analysis of diet and provenance. Carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) should be undertaken on bone collagen for dietary reconstruction on all individuals, targeting ready fragmented ribs to reduce the destructive impact on the material. Strontium ($^{87}Sr/^{86}Sr$) should be undertaken on the enamel of M1, which provides a geological signal relating to childhood place of residence. Oxygen ($\delta^{18}O$) isotope analysis to provide a comparable climatic signal for place of origin should be performed on adjacent enamel from the same or an equivalent tooth. Both dietary and provenancing analysis may be augmented by sulphur ($\delta^{34}S$) isotope analysis of bone collagen. This provides an indication of coastal proximity and/or the consumption of marine foods in the years before death. Due to the limited detail provided by scanning of bones in assessment stage, individuals to be targeted for isotope analysis will be identified during detailed osteological reporting. It is advisable to undertake a substantial programme of analysis, on at least 50% of the individuals for mobility. In terms of dietary analysis 100% of individuals should be sampled, as it is cheap and needs more samples to make sense of the data.

- aDNA – precise recommendation will be besed on the results of full osteological analysis. The site has potential to investigate a range of issues pertinent to Early Medieval Wales, including migration and the use of family plots. aDNA analysis can also be useful in determining sex or the presence of pathologies when preservation does not allow this to be estimated osteologically

8. COSTING AND TIMING

Full osteological analysis and reporting on the material is estimated to take a further 35 days. Quotes for cost of producing a skeletal report can be provided on request.

Isotope analysis has not been quoted for in this assessment as it would be advantageous to have undertaken full osteological analysis prior to detailing a precise research strategy.

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AB1703 WYLFA HEAD
INDIVIDUAL SKELETON SUMMARIES

G15, SK10.1760

Preservation: 5+

Completeness: poor (5-25%). Total number of fragments =25

Sex: indeterminate

Age: 12+
Only one tooth present, a lower third molar. Enamel formation completed indicating this individual is at least 12.

Taphonomy: severe surface modification through erosion and root action

Measurements: none

Pathology/Trauma: none

Dental health: mild wear, score 2 (Buikstra and Ubelaker 1994, Brothwell 1981). No hypoplasia or caries recorded

Anatomical variations: none

G16, SK10.1770

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: 25 – 35.
Based on dental attrition only

Taphonomy: post-mortem breakage, surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: no carious lesions observable. Slight calculus (after Brothwell 1981-add to methodology in report) surviving on several teeth. No evidence of hypoplasia

Anatomical variations: none

G26, SK10.1801

Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate

Age: 25-35

Based on dental attrition, note that tooth identification not positive so age estimate is tentative.

Taphonomy: soil staining, root action, surface erosion, post-mortem breakage

Measurements: postcranial (femoral diameters)

Pathology/Trauma: none

Dental health: slight supra-gingival calculus surviving on all but one tooth. No carious lesions or evidence of hypoplasia

Anatomical variations: none

G28, SK10.1885

Preservation: 5+

Completeness: <5%

Only small frags labelled right femur (pictured left) and skull (right)

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: none

Anatomical variations: none

G33 SK10.1772

Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate

Nuchal crest scored in middle of scale, inconclusive

Age: 17-25

Based on dental attrition only, some supporting evidence from cranial suture closure (less than 35 years)

Taphonomy: root action, soil staining, post-mortem breakage

Measurements: none

Pathology/Trauma: endocranial lesion on frontal bone, measuring 2.85mm in diameter

Dental health: no evidence of calculus, caries, or hypoplasia. Minimal wear

Anatomical variations: none

G35, SK10.1941

Preservation: 4

Completeness: <5%

Two skull fragments only, endocranial surface (ectocranial cortical bone not surviving)

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: none

Anatomical variations: none

G40, SK10.1536

Preservation: n/a

Completeness: <5%

One fragment identifiable as molar

Sex: indeterminate

Age: indeterminate

Taphonomy: enamel fragmentation, loss of interior tooth structure and root

Measurements: none

Pathology/Trauma: none

Dental health: none

Anatomical variations: none

Additional fragments of enamel and one crown of an upper 3rd molar recovered from flotation of soil samples. Minimal wear was noted on the molar but as it is the only complete crown from this individual no age estimation has been attempted

G41, SK10.1496

Preservation: 5+

Completeness: <5%

Two fragments labelled left and right femur, further identification not possible

Sex: indeterminate

Age: indeterminate

Taphonomy: extreme surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: none

Anatomical variations: none

G44, SK10.2925

16 teeth and some fragments of enamel were recovered from flotation of soil samples from G44. As no skeletal remains were recorded at excavation, they were assigned a skeleton number at analysis stage.

Preservation: n/a

Completeness: poor (5-25%)

Sex: indeterminate

Age: 17-25

Based on dental attrition.

Taphonomy: post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of pathology, slight wear.

Anatomical variations: none

G48, SK10.1717

Preservation: 5

Completeness: <5%. Fragments of skull

Sex: indeterminate

Age: indeterminate

Taphonomy: post-mortem breakage, surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: none

Anatomical variations: none

G52, SK10.2923

1 tooth was recovered from flotation of soil samples from G52. As no skeletal remains were recorded at excavation, they were assigned a skeleton number at analysis stage. The tooth was a lower right molar (M2 or 3?), which was too fragile to clean as only the enamel survived.

Preservation: n/a

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Minimal wear of molar suggests younger adult, but as only one tooth surviving age has not been estimated

Taphonomy: n/a

Measurements: none

Pathology/Trauma: none

Dental health: no pathology noted, minimal wear.

Anatomical variations: none

G56, SK10.0931

Preservation: 3

Completeness: good (50-75%)

Sex: possible female

Based on morphology of the skull and distal humerus

Age: 22-25

Based on epiphyseal fusion of medial clavicle and dental attrition

Taphonomy: drying cracks (clavicle, frontal), root action, post-mortem breakage

Measurements: some cranial and post-cranial, but none for stature determination available

Pathology/Trauma: none

Dental health: slight wear, no evidence of linear hypoplasia or other enamel defects. No caries or calculus visible

Anatomical variations: possible squatting facet

A further tooth was recovered from flotation of soil samples associated with this skeleton. It was identified as a possible left first premolar with minimal attrition visible. The wear stage of this tooth agrees with the age estimate provided originally.

G62, SK10.1109

Preservation: 4

Completeness: good (50-75%)

Sex: male
Based on traits of the skull and distal humerus

Age: 18-25
Based on dental eruption and attrition, epiphyseal fusion

Taphonomy: root action, soil staining, surface erosion, post-mortem breakage

Measurements: cranial and post-cranial. Stature estimated at 178 +/-3.27cm

Pathology/Trauma: none

Dental health: slight wear, though moderate on upper and lower incisors. No caries or calculus

Anatomical variations: enamel pearl with dentine, upper left M2

G80, SK10.0747

Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate

Age: 25 – 35?
Age estimation based on dental attrition was attempted but enamel fragmentation obscured occlusal surface in some places, so this result is tentative.

Taphonomy: surface erosion, post-mortem breakage, slight soil staining

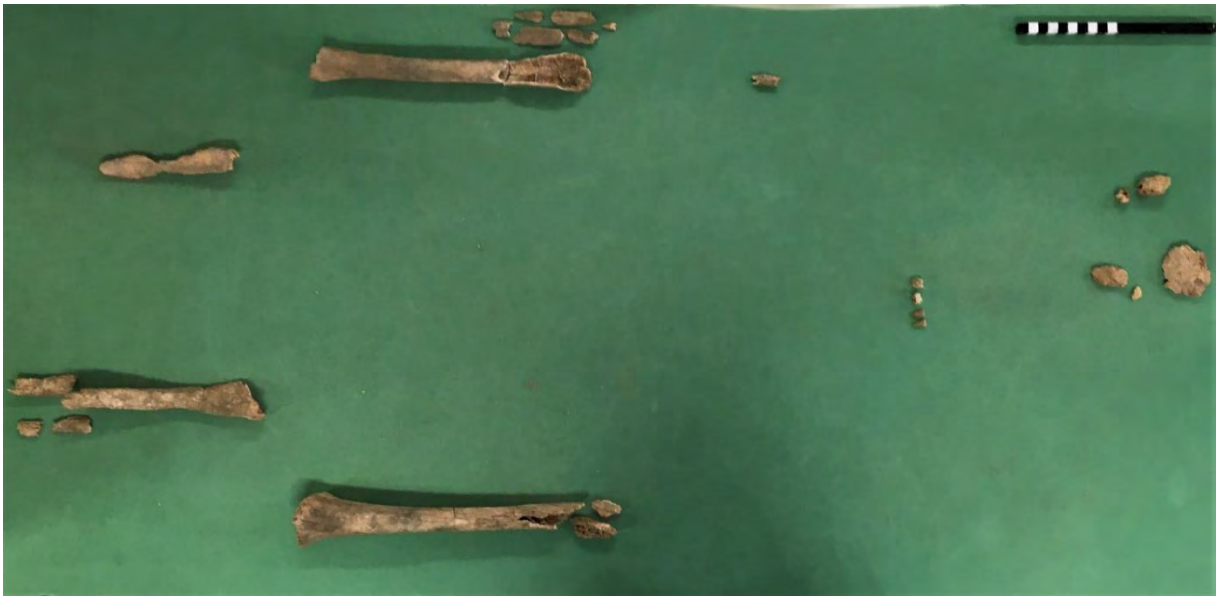
Measurements: none

Pathology/Trauma: none

Dental health: no evidence surviving due to poor condition of teeth

Anatomical variations: none

G80, SK10.0749



Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: 17 – 25?
Based on dental attrition of 2 fragmentary molars, tentative estimate

Taphonomy: soil staining, post-mortem breakage, extensive surface erosion

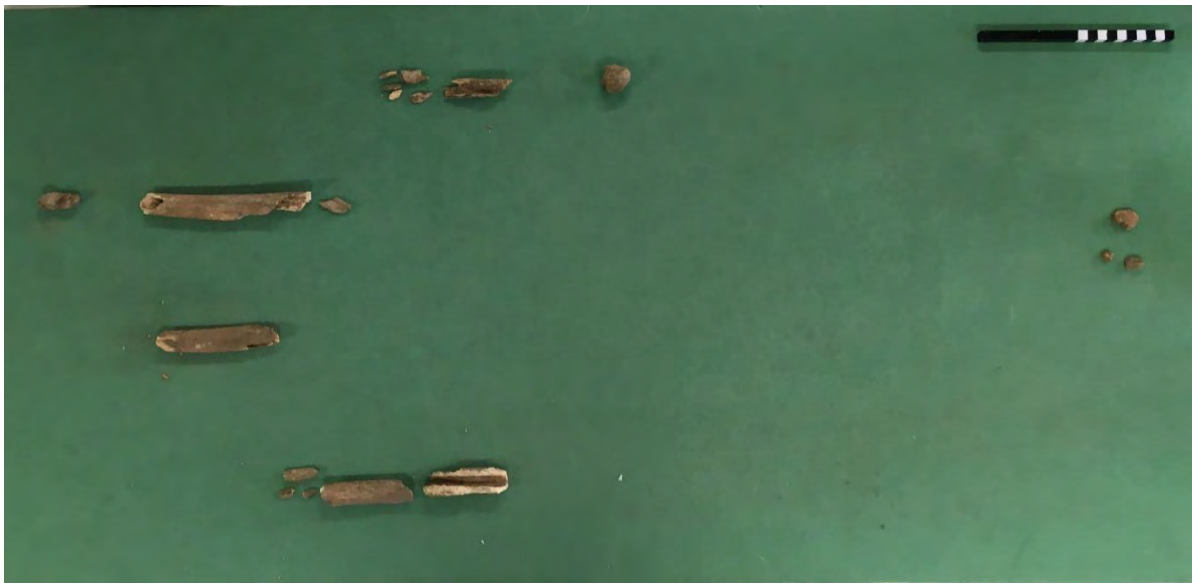
Measurements: some post-cranial metrics available (long bone diameters)

Pathology/Trauma: none

Dental health: slight calculus surviving on one surface of ?LM2

Anatomical variations: none

G86, SK10.0876



Preservation: 3

Completeness: poor (5-25%)

Sex: indet

Age: indet

Taphonomy: post-mortem breakage, some surface erosion

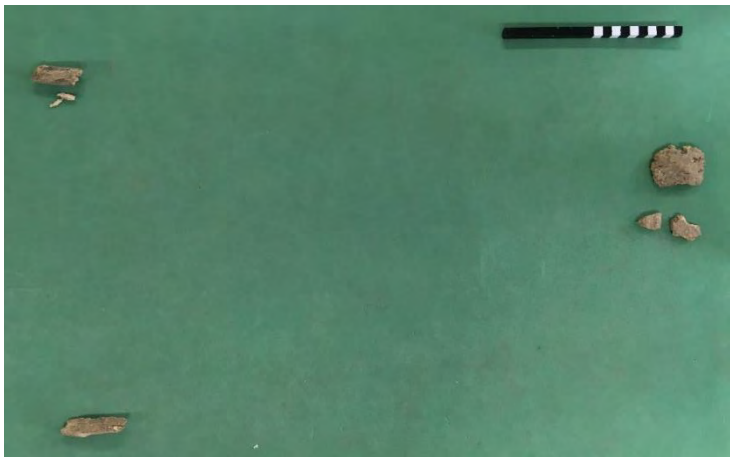
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G87, SK10.0732



Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: soil staining, post-mortem breakage, surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

In addition, two teeth were recovered from flotation of soil samples from this grave, a lower first molar and an upper third molar. Both displayed moderate wear, indicating this individual is a middle adult but without further evidence no age range can be provided.

G89 SK10.0793

Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, soil staining, possible insect activity, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G93, SK10.0294

Preservation: 3

Completeness: poor (5-25%)

Sex: n/a (juvenile)

Age: 7 – 12
Based on dental eruption/presence of mixed dentition age estimate is 9yrs +/- 3, however thought to be more than 7 due to some wear on permanent incisors

Taphonomy: post-mortem breakage, some surface erosion

Measurements: none

Pathology/Trauma: joint disease

Dental health: possible LEH on canine, obscured by staining and enamel fragmentation. Slight calculus surviving on two teeth, moderate on one.

Anatomical variations: none

G98, SK10.0516

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: 17-30
Based on dental attrition, but not clear due to ambiguous tooth identification and enamel fragmentation. Aged at 17+ due to eruption of third molars, thought to be less than 30 due to slight wear (where visible).

Taphonomy: post-mortem breakage, surface erosion

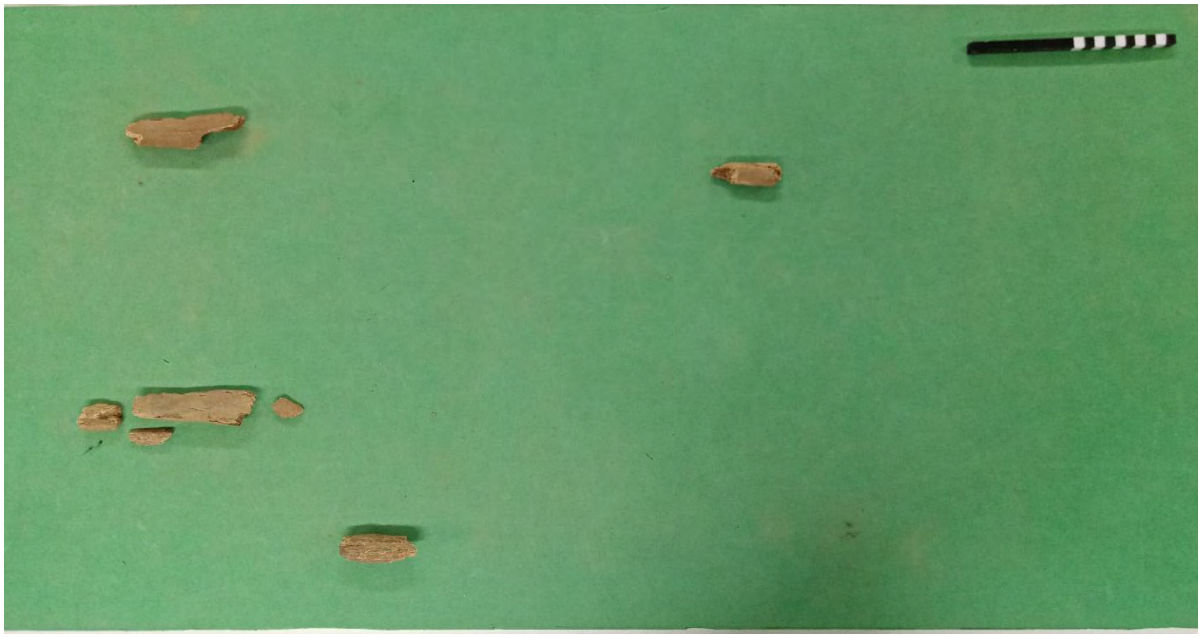
Measurements: none

Pathology/Trauma: none

Dental health: recording of dental health obscured by poor condition of teeth, however no evidence of caries or developmental enamel defects such as LEH. Calculus would not have survived. Wear is slight.

Anatomical variations: possible shovel teeth (upper first incisor), level of expression could not be graded due to enamel fragmentation

G99, SK10.0842



Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breakage

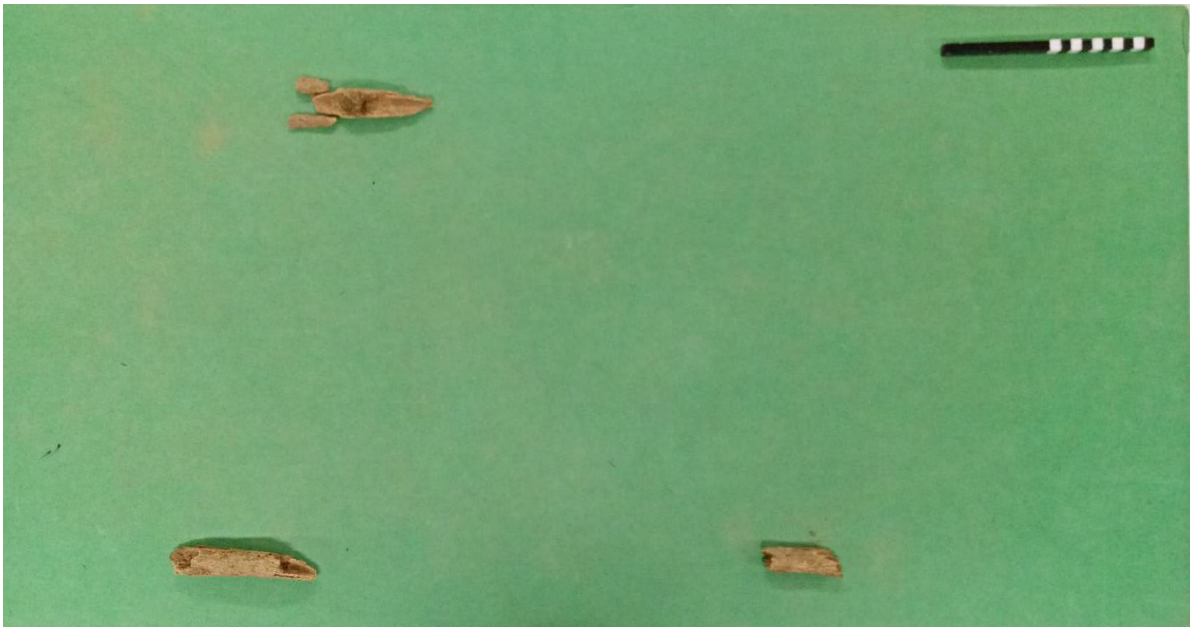
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G99, SK10.0856



Preservation: 5 **Completeness:** poor (5-25%) **Sex:** indeterminate **Age:** indeterminate
Taphonomy: surface erosion, post-mortem breakage **Measurements:** none **Pathology/Trauma:** none **Dental health**: n/a **Anatomical variations**: none

G100, SK10.0745

Preservation: 4

Completeness: fair (25-50%)

Sex: indeterminate
Two features used in sex estimation surviving (mental eminence and nuchal crest) but in poor condition. Not scored due to surface erosion.

Age: 33-55
Combined estimate based on Lovejoy (1985) and Brothwell (1981) methods of scoring dental attrition.

Taphonomy: post-mortem breakage, surface erosion

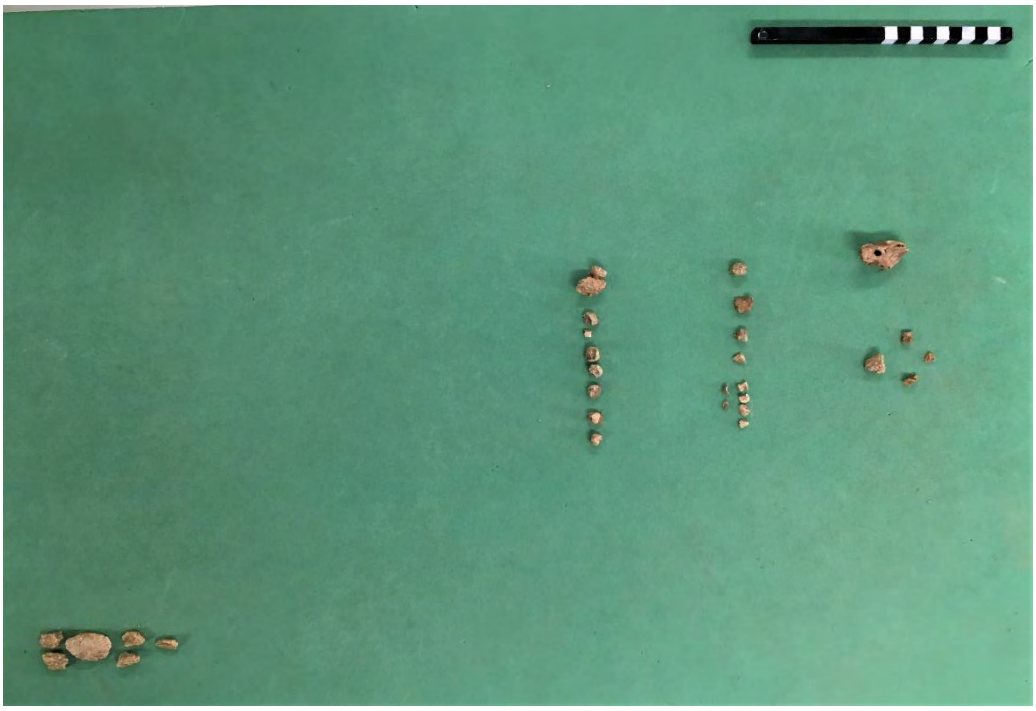
Measurements: none

Pathology/Trauma: enthesophyte on left femur (linea aspera)

Dental health: severe wear but no evidence of pathology

Anatomical variations: foramen on ectocranial surface of occipital, superior to nuchal crest.

G101, SK10.0118



Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: 17-25?
Based on dental attrition. Teeth do not seem heavily worn but enamel fragmentation obscured some areas.

Taphonomy: surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of dental pathology or non-specific conditions

Anatomical variations: none

G110, SK10.1703

Preservation: n/a
Only teeth and petrous portion of temporal surviving (not included in surface preservation analysis due to its increased robusticity to erosion over other bones)

Completeness: <5%

Sex: indeterminate

Age: 5 - 17?
Lower second premolar and upper first or second molar identified. Ages of enamel formation completion for these teeth gives minimum age estimate, and lack of wear gives possible upper limit according to Brothwell 1981.

Taphonomy: loss of interior structure of teeth

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of caries/calculus/enamel defects

Anatomical variations: none

G111, SK10.0715

Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate
Supraorbital margin scored as 4, possible female, but without other traits present sex cannot be estimated

Age: 17 – 25
Based on dental attrition only

Taphonomy: post-mortem breakage, surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: mild calculus recorded on two teeth – labial surface lower first incisor and distal surface of upper left second molar

Anatomical variations: none

G113, SK10.0430

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: 25 – 45
Few teeth surviving, those in occlusion show moderate wear

Taphonomy: soil staining, post-mortem breakage, surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of dental pathology or non-specific conditions

Anatomical variations: none

6 additional teeth were recovered from flotation of soil samples of G113. While it is not clear which of the two skeletons in the grave the teeth belong to, the wear pattern seems broadly consistent with SK10.0430.

G113, SK10.0445

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: post-mortem breakage, soil staining, surface erosion

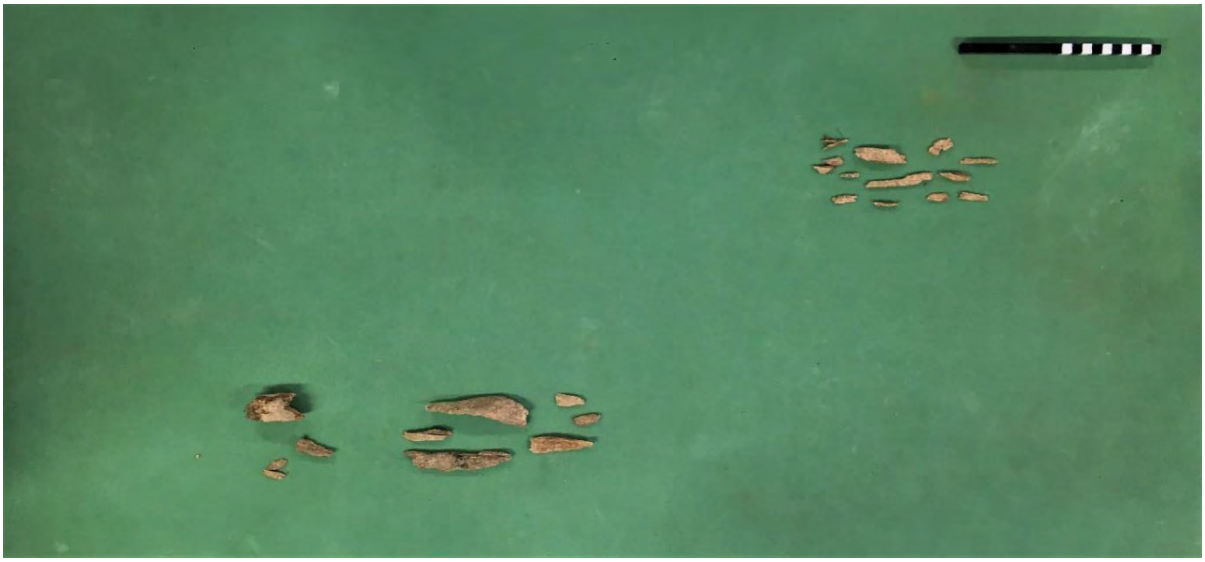
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G114, SK10.0436



Preservation: 5+

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion, warping of fragments, soil staining, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G115, SK10.0620

Preservation: 5

Completeness: fair (25-50%)

Sex: female?
Based on morphology of fragmentary pelvis

Age: 25+
Based on fusion of first and second sacral vertebrae

Taphonomy: soil staining, post-mortem breakage, surface erosion

Measurements: some postcranial measurements taken, however those relating to stature not available due to loss of medial epicondyle of femur.

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G116, SK10.0471

Preservation: 3

Completeness: poor (5-25%)

Sex: female?
Based on morphology of fragmentary pelvis

Age: 25- 40
Based on dental attrition

Taphonomy: post-mortem breakage, surface erosion, soil staining

Measurements: none

Pathology/Trauma: possible trauma to right acetabulum, mild cribra orbitalia

Dental health: no evidence of dental pathology or non-specific conditions

Anatomical variations: none

G116, POSSIBLE SECOND INHUMATION (SK 10.0471B)

SK10.0471 contained three bags labelled “possible second inhumation”. No repeated elements were found so the MN1 of G116 is still 1, however based on the contextual information these remains were treated separately.

The bags identified as a possible second individual were in extremely poor condition, consisting of four enamel fragments and small long bone fragments labelled “possible left forearm” and “tibia/fibula”. It was not possible to confirm this identification due to the condition of the bone.

Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion, post-mortem fragmentation

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G118, SK10.0502

Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G119, SK10.0875

Preservation: 5

Completeness: poor (5 – 25%)

Sex: indeterminate

Age: 14+
Based on epiphyseal fusion.

Taphonomy: soil staining, post-mortem breakage, surface erosion

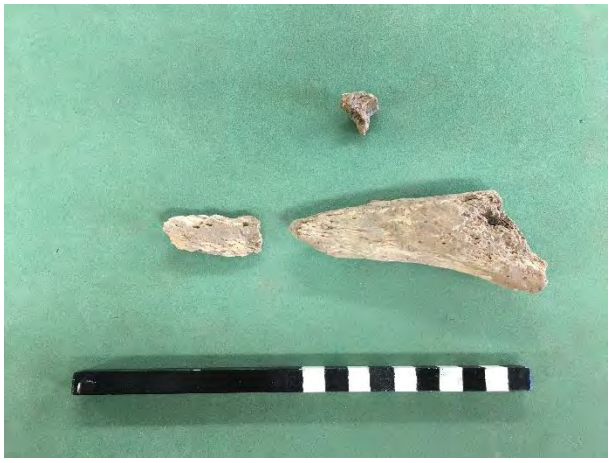
Measurements: none (surface erosion too severe for long bone diameter measurements)

Pathology/Trauma: none

Dental health: one tooth present (possibly upper second molar). Slight wear, no evidence of any pathology or enamel defects

Anatomical variations: none

G120, SK10.0551



Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G121, SK10.1103 AND SK10.2919

MNI of grave 121 was amended to 2 upon osteological analysis, which identified duplicated skeletal elements. Duplicated elements (occipital, left and right temporals; pictured left) were assigned new skeleton number 10.2919, however due to poor preservation no other elements could be assigned to a specific individual.

Preservation: 5

Completeness: n/a (2 individuals)

Sex: indeterminate

Age: Left femur is from an individual of at least 16, as is right tibia

Taphonomy: post-mortem breakage, soil staining, surface erosion, root action, warping of fragments

Measurements: none

Pathology/Trauma: none

Dental health: one canine present, moderate to heavy wear. No pathology visible due to poor condition

Anatomical variations: none

G123, SK10.1715

Preservation: 5+

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: soil staining, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G125, SK10.1709

Preservation: 3

Completeness: fair (25-50%)

Sex: indeterminate

Age: 16 – 25
Based on dental attrition

Taphonomy: post-mortem breakage, surface erosion, soil staining

Measurements: some cranial and postcranial measurements possible but none relating to stature

Pathology/Trauma: none

Dental health: carious lesions of lower right M1 and upper M2. Caries of lower M1 associated with possible periapical cavity (abscess) and alveolar resorption

Anatomical variations: none

G137, SK10.0016

Preservation: 5

Completeness: poor

Sex: indeterminate

Age: Adult

Presence of mild to moderate wear of permanent molar indicates this individual is an adult. Note that wear scored in 25-35 age range but this cannot be provided as an age estimate as only 2 teeth are observable

Taphonomy: post-mortem fragmentation, surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of pathology, mild-moderate wear

Anatomical variations: none

G139, SK10.2129

Preservation: 4

Completeness: <5%

Sex: indeterminate

Age: 17 – 25

Based on dental attrition only

Taphonomy: surface erosion, enamel fragmentation

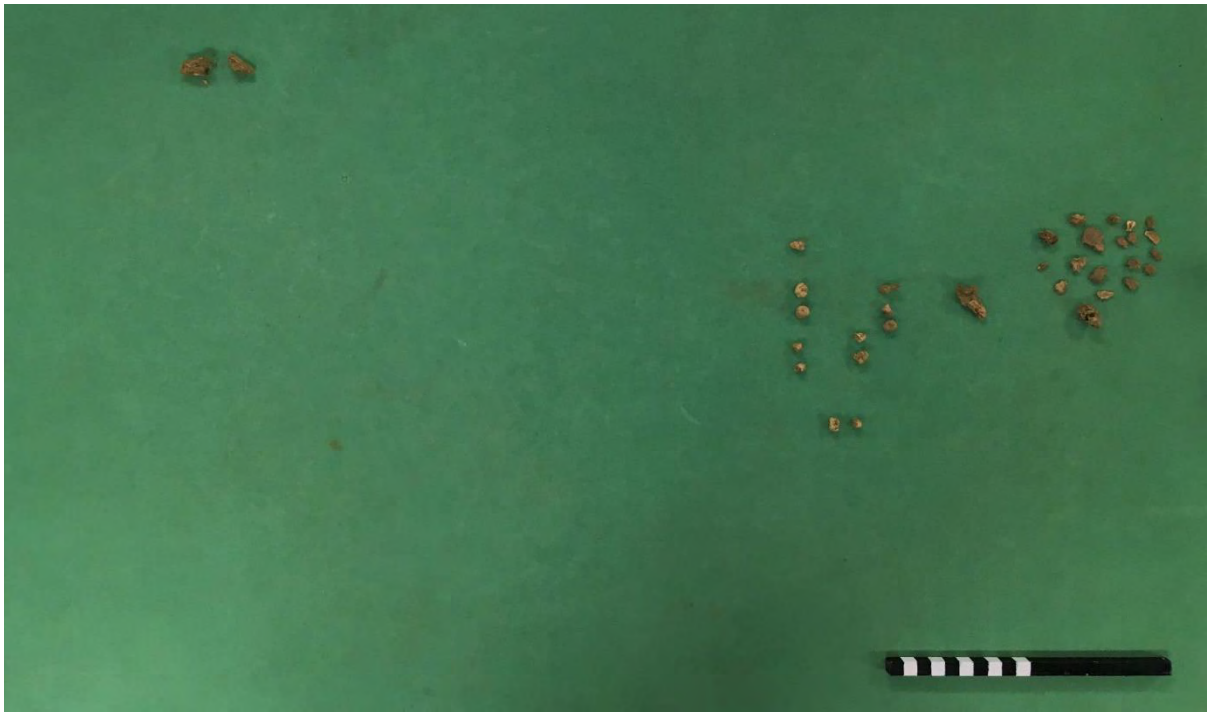
Measurements: none

Pathology/Trauma: none

Dental health: no evidence of pathology, minimal wear

Anatomical variations: none

G140, SK10.0342



Preservation: 5+

Completeness: poor (5-25%)

Sex: indeterminate/juvenile

Age: 12 – 17

All permanent teeth present but lack of wear suggests less than 17 years old. Enamel formation of third molar is complete suggesting individual is 12+, but no root surviving (of any teeth) to record root formation.

Taphonomy: severe surface erosion, enamel fragmentation

Measurements: none

Pathology/Trauma: none

Dental health: LEH recorded on canine

Anatomical variations: none

G141, SK10.0697

Preservation: 5+

Completeness: poor (5-25%)

Sex: indeterminate

Age: 16 – 25
Based on dental attrition

Taphonomy: post-mortem breakage, surface erosion, enamel fragmentation

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of pathology/non-specific conditions, mild wear

Anatomical variations: none

G142, SK10.1355

Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate (juvenile)

Age: 7 – 13

Based on mixed permanent and deciduous dentition

Taphonomy: surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: advanced wear of deciduous teeth, mild

Anatomical variations: none

One further tooth recovered from flotation of soil samples. Only the enamel survived with none of the interior structure or root, possibly a lower M2. Slight wear present.

G143, SK10.0730

Preservation: 3

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: post-mortem breakage, some surface erosion

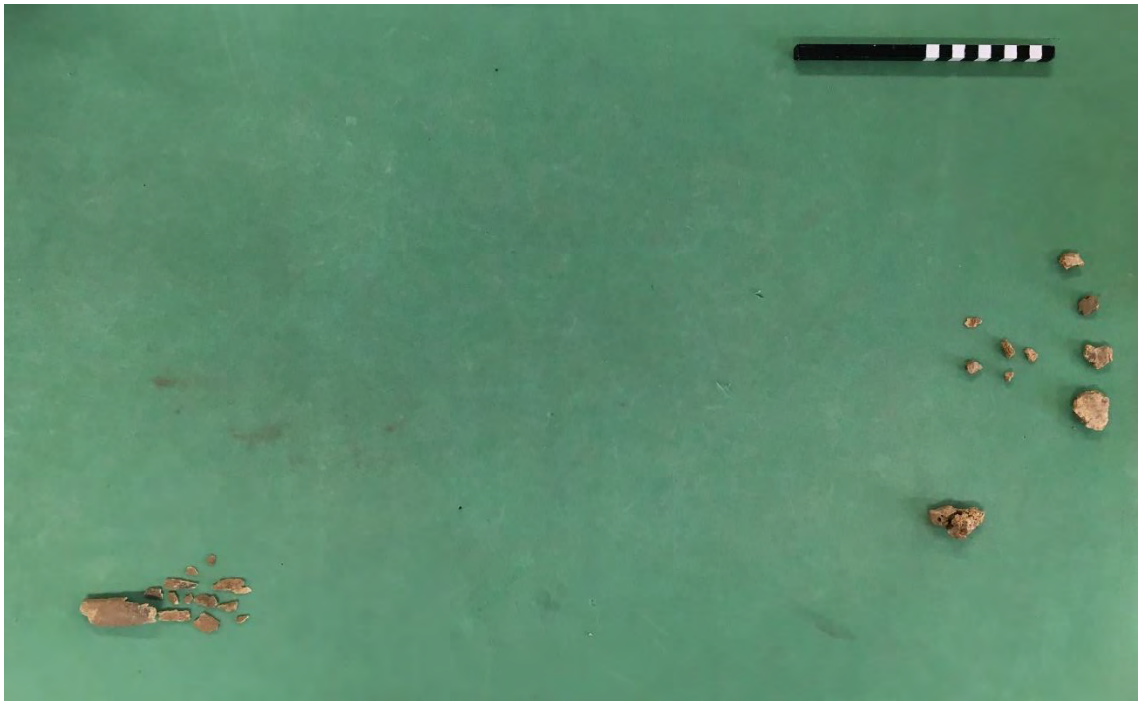
Measurements: femoral diameters

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G144, SK10.0098



Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G146, SK10.0612

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: 12 – 17

Based on root formation of 3rd molars, 15 years +/- 36 months

Taphonomy: surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of dental pathology, no wear

Anatomical variations: none

G147, SK10.0149

Preservation: n/a

No cortical surface surviving

Completeness: <5%

One small fragment of basicranium and enamel fragments – no whole teeth

Sex: indeterminate

Age: indeterminate

Taphonomy: enamel fragmentation

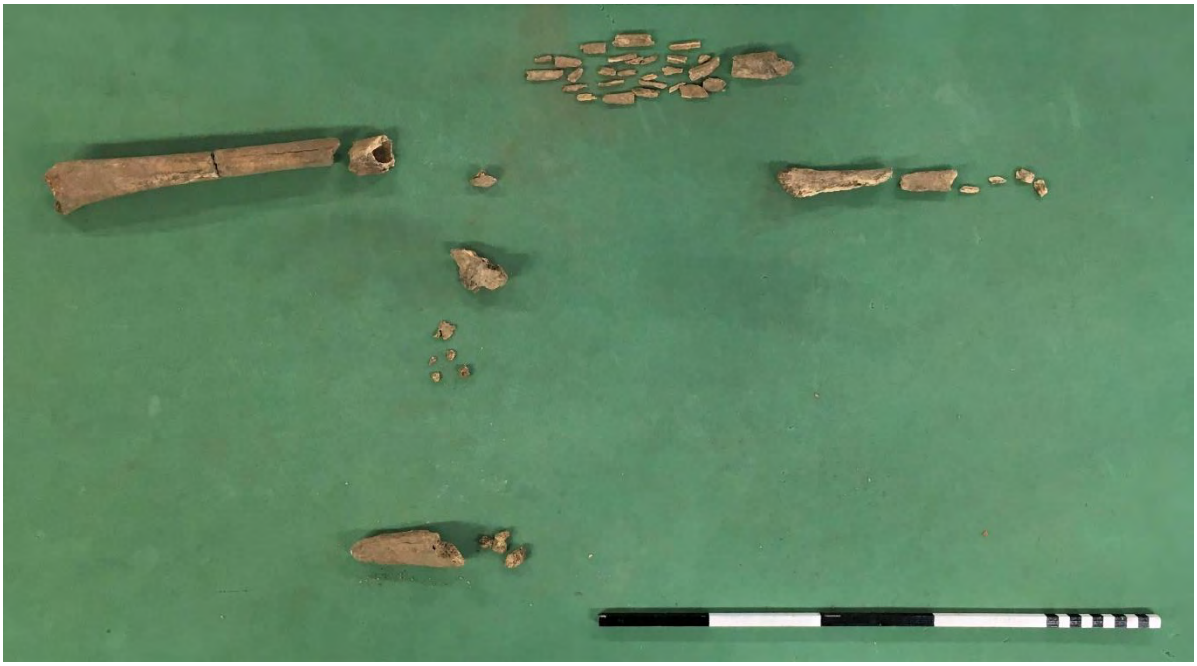
Measurements: none

Pathology/Trauma: none

Dental health: not observable

Anatomical variations: none

G148, SK10.0211



Preservation: 3

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: post-mortem breakage, some surface erosion

Measurements: some post-cranial available, none related to stature

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G153, SK10.0859

Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, fragmentation

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

Two additional teeth were recovered from flotation of soil samples. These were identified as lower second and third molars, likely from the right side. No wear was visible indicating that this was a young individual, however poor preservation prevents the provision of an age estimate.

G154, SK10.0776

Preservation: 4

Completeness: fair (25-50%)

Sex: indeterminate

Age: 25 – 55

Age estimate based on dental attrition.

Taphonomy: surface erosion, soil staining, post-mortem breakage

Measurements: post-cranial

Pathology/Trauma: none

Dental health: moderate wear, no pathology observable (severe enamel fragmentation)

Anatomical variations: none

G156, SK10.1211

Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G163, SK10.0158

Preservation: 5+

Completeness: <5%

Three bags associated with this skeleton, but only contained tiny fragments and bone dust. Not photographed

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion

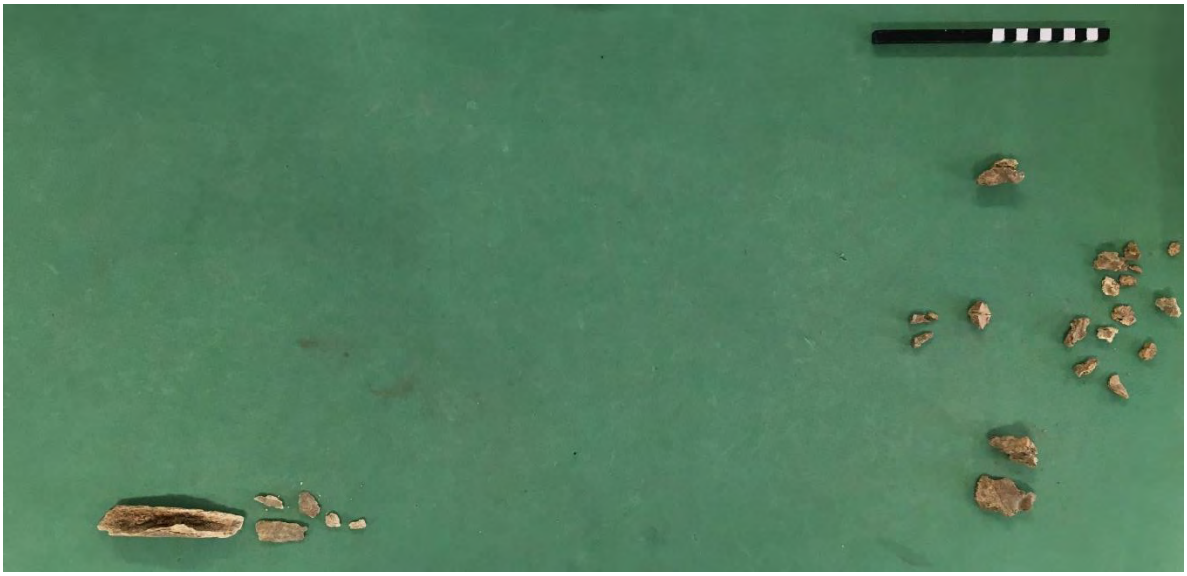
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G174, SK10.1993



Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: 30-50?

Based on dental attrition of only two teeth

Note – an additional tooth fragment was recovered from flotation of soil samples associated with this skeleton. Difficult to identify but appears to be a canine or premolar displaying heavy wear, consistent with the teeth recovered from excavation.

Taphonomy: surface erosion, post-mortem breaks

Measurements: none

Pathology/Trauma: none

Dental health: heavy wear, no pathology/non-specific conditions observed

Anatomical variations: none

G180, SK10.0050

Preservation: n/a

Completeness: <5%

Fragment of tooth root

Sex: indeterminate

Age: indeterminate

Taphonomy: n/a

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G183, SK10.2924

Several teeth were recovered from flotation of soil samples from grave 183. As no skeletal remains were recorded in this grave at excavation, these were given a skeleton number at analysis stage (10.2924). The teeth recovered consisted of c.5 crowns (enamel only) and some enamel fragments. Identifiable teeth were lower first molars, a lower second molar (left?), a lower left canine and a second premolar.

Preservation: n/a

Completeness: <5%

Sex: indeterminate

Age: 17-25

Based on dental attrition

Taphonomy: n/a

Measurements: none

Pathology/Trauma: none

Dental health:

Anatomical variations: 3 cusped P2

G184, SK10.0542

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breaks

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G187, SK10.0611

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breaks

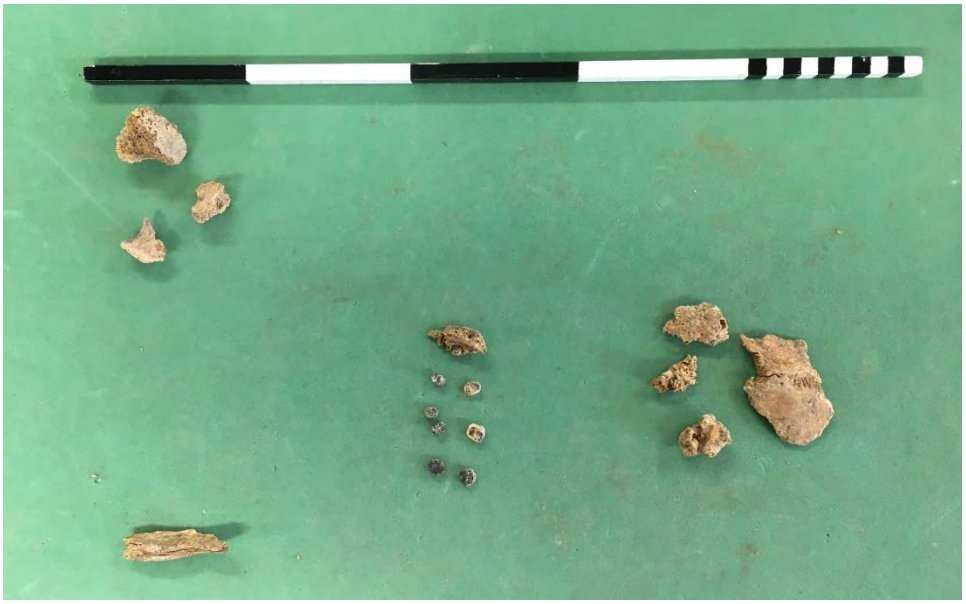
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G195, SK10.0595



Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate

Age: 24 – 35

Age estimate based on dental attrition

Taphonomy: surface erosion, post-mortem breakage

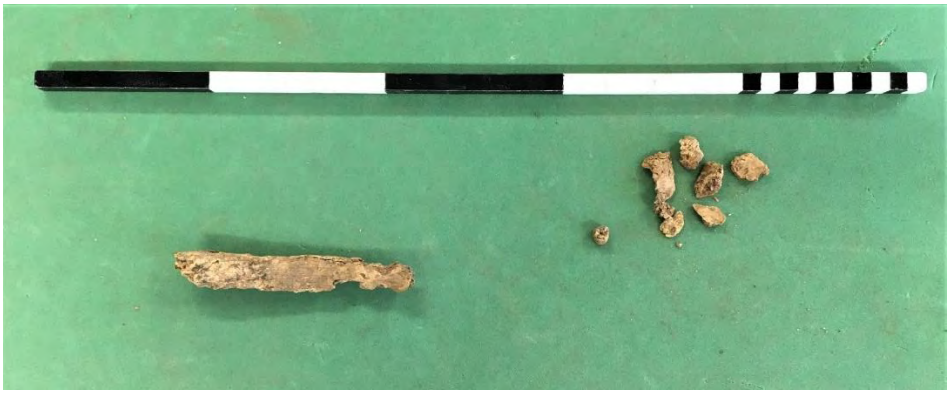
Measurements: none

Pathology/Trauma: none

Dental health: moderate wear, no evidence of pathology. Most teeth are crowns only due to taphonomy

Anatomical variations: none

G212, SK10.0457



Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: young adult

Maxillary 3rd molar present with minimal wear suggests individual is at least 18 but not much more. Without further evidence cannot provide age range.

A second maxillary third molar was recovered from flotation of soil samples associated with this skeleton. The lack of wear matches that of the tooth recovered during excavation, suggesting it is from the same young individual

Taphonomy: post-mortem breakage, severe surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: only one tooth present with mild wear, no other pathology

Anatomical variations: none

G217, SK10.0348

Preservation: 3

Completeness: fair (25-5-%)

Sex: male?

Age: 25-35

Based on dental attrition

Taphonomy: soil staining, some surface erosion, post-mortem breakage

Measurements: cranial only

Pathology/Trauma: enthesophyte of the distal left humerus (medial aspect)

Dental health: moderate wear, no evidence of pathology or non-specific conditions

Anatomical variations: retained metopic suture

G228, SK10.1002

Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion, soil staining

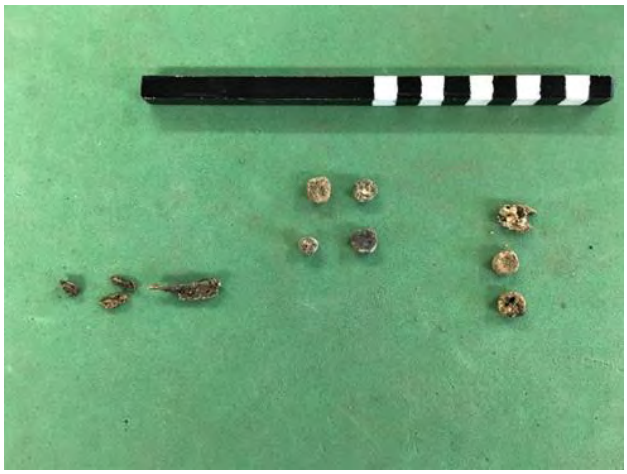
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G230, SK10.1236



Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: 12-25

Based on dental attrition

Taphonomy: severe surface erosion, soil staining, enamel fragmentation.

Measurements: none

Pathology/Trauma: none

Dental health: minimal wear, no evidence of pathology or non-specific conditions

Anatomical variations: none

G233, SK10.1607

Preservation: 5+

Completeness: poor (5-25%)

Sex: indeterminate

Age: adult

Presence of wear on premolar suggests adult (stage D-E according to Lovejoy 1985, or 20-30 years), however with only one tooth surviving cannot provide age estimate.

Taphonomy: severe surface erosion, insect activity, soil staining

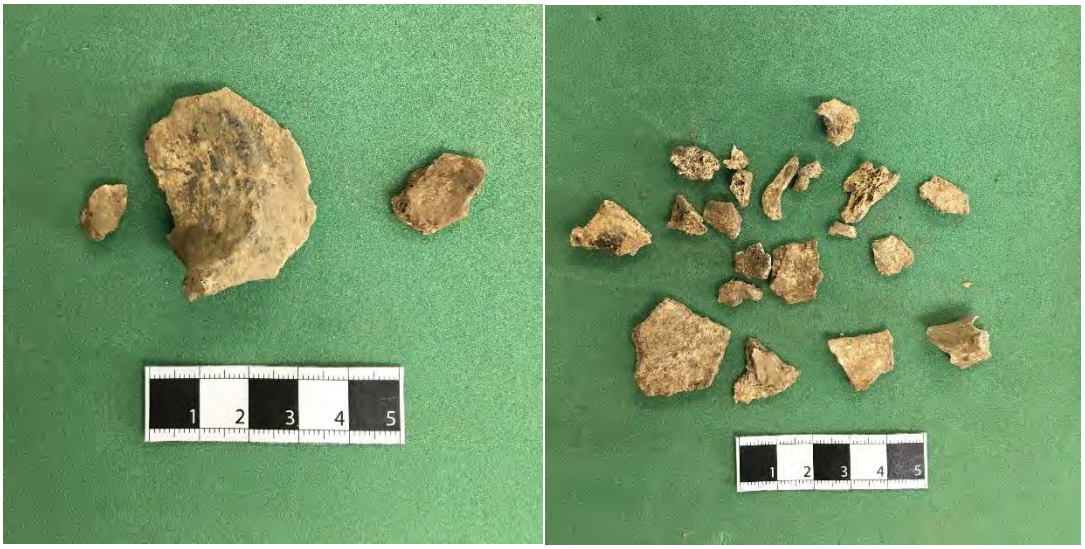
Measurements: none

Pathology/Trauma: none

Dental health: some enamel fragments a crown of a premolar, no dental health indicators observable

Anatomical variations: none

G233, SK10.2920



Preservation: n/a (burnt – no surface erosion)

Completeness: <5%

Total weight of fragments is 14g. (Also 3 fragments given SF numbers but consisting of burnt skull pieces from this grave, so assumed to belong to this individual)

Sex: indeterminate

Age: indeterminate

Taphonomy: post-mortem breakage

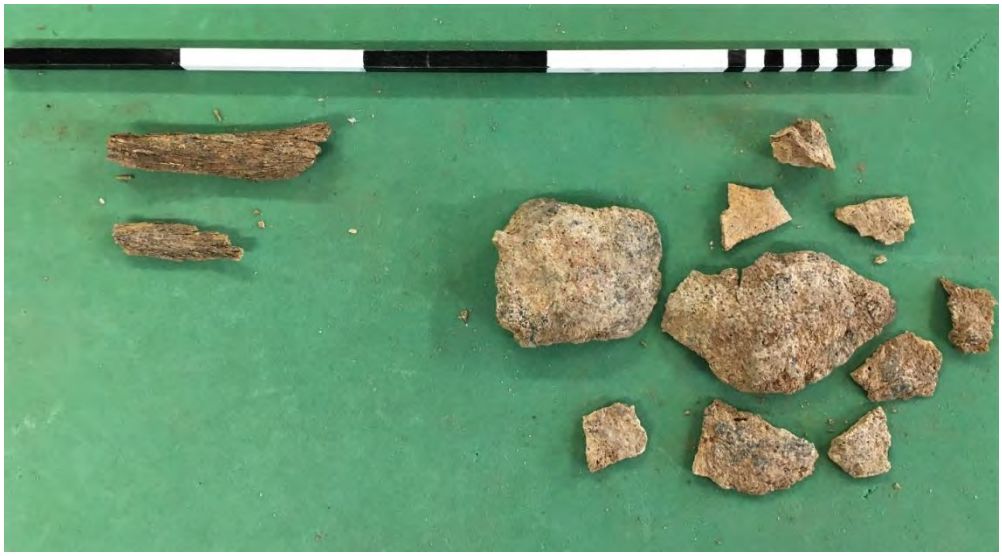
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G236, SK10.1353



Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, soil staining, post-mortem breakage

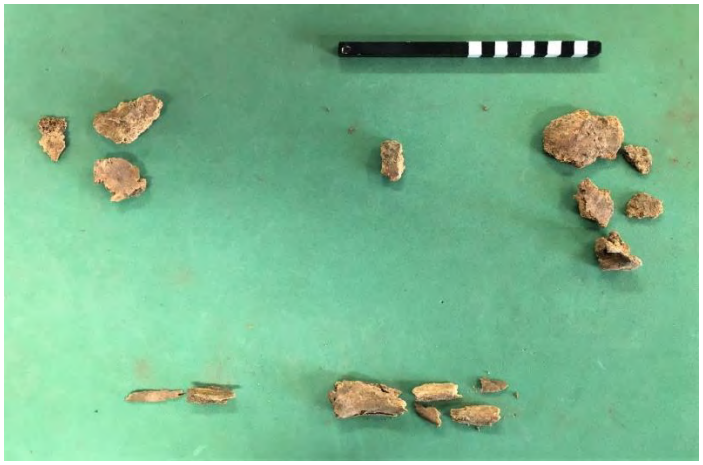
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G240, SK10.0584



Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: soil staining, surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G243, SK10.0784 AND SK10.2922

At excavation it was noted that two individuals at least were present in G243, but due to preservation elements could not be assigned to a specific individual and so only one context number was assigned. The second individual given number 10.2922 at analysis stage. Only one femoral fragment can be identified as supernumerary. MNI is 2.

Preservation:

Completeness: n/a (2 individuals present)

Sex: indeterminate

Age: at least one adult is present, based on dental attrition. Left tibia fragment belongs to an individual of 14+

Taphonomy: post-mortem fragmentation, soil staining, surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: moderate wear

Anatomical variations: none

G251, SK10.0727

Preservation: 4

Completeness: <5%

Sex: indeterminate

Age: 10 – 18?

Presence of a lower first or second molar crown with minimal wear suggests tooth in first few years after eruption.

Taphonomy: surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of pathology or non-specific stress

Anatomical variations: none

G253, SK10.0971

In addition to the elements pictured, 16 teeth were recovered from flotation of soil samples associated with skeleton 10.0971.

Preservation: 5+

Completeness: poor (5-25%)

Sex: indeterminate

Age: 17-25

Based on dental attrition

Taphonomy: severe surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of pathology, wear was slight.

Anatomical variations: none

G256, SK10.0762

Preservation: 4

Completeness: fair (25-50%)

Sex: male?
Based on features of the skull which ranged from inconclusive to possible male. Some supplementary cranial features such as frontal slope and orbital shape were classed as male.

Age: 33-55

Based on dental attrition 33-55, with some supporting evidence from fragmentary auricular surface of pelvis suggesting individual may be 40-44

Taphonomy: soil staining, post-mortem breakage, surface erosion

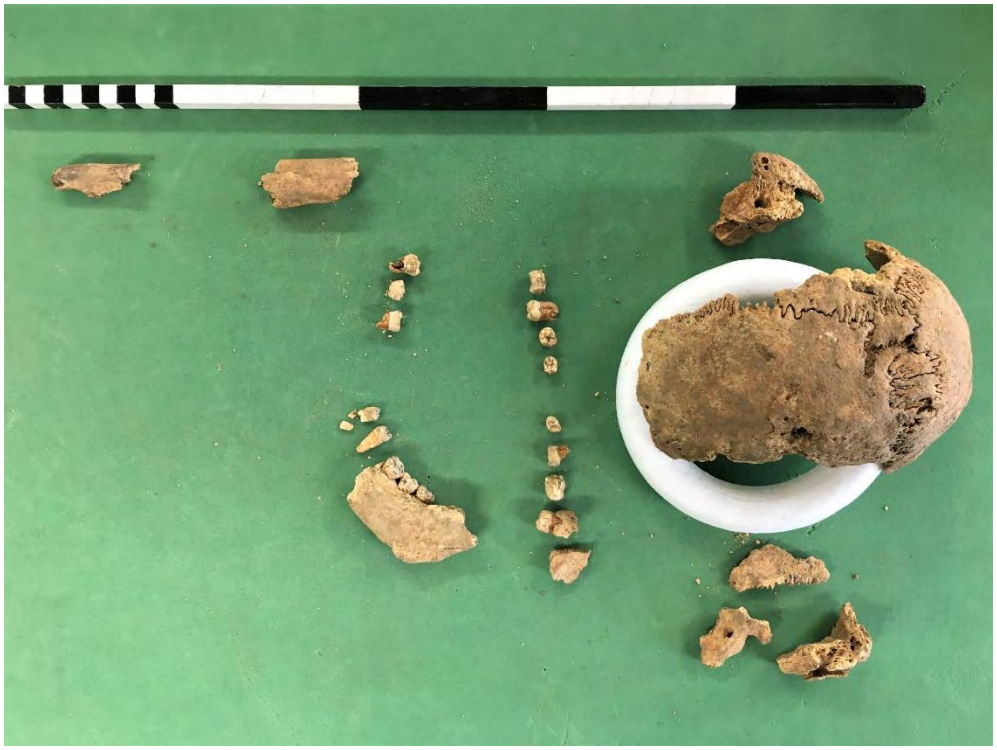
Measurements: cranial and post-cranial measurements available, but none relating to stature

Pathology/Trauma: none

Dental health: antemortem loss of right mandibular first molar with associated abscess and alveolar resorption. Similar bone loss noted at roots of mandibular central incisors, but those teeth are lost post-mortem so any associated caries not observable

Anatomical variations: none

G257, SK10.0807



Preservation: 4

Completeness: poor (5-25%)

Sex: male?
Skull morphology scored as possible male with supporting evidence from flaring at gonian angle.

Age: 16 -25
Based on dental attrition, with cranial suture closure suggesting young adult also.

Taphonomy: post-mortem breakage, surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of pathology or non-specific conditions. Dental wear is slight

Anatomical variations: wormian bones (apical bone and lambdoidal ossicles)

A further tooth was recovered from flotation of soil samples associated with this skeleton. It was identified as a right upper canine with part of the root surviving. Possible dental enamel hypoplasia was noted but obscured by soil staining. The slight wear on the tooth agrees with the age estimate originally provided for SK10.0807

G258, SK10.1059

Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G262, SK10.1869

Preservation: 3

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: post-mortem fragmentation

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G263, SK10.1565

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion, insect activity

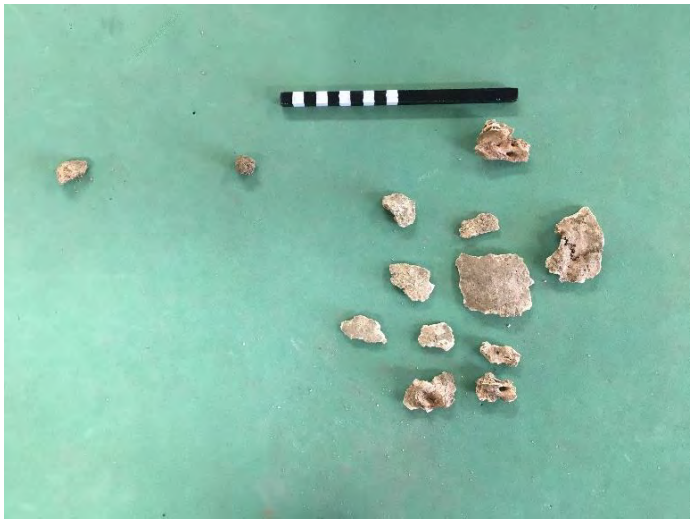
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G264, SK10.1342



Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G265, SK10.1042

Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breakage

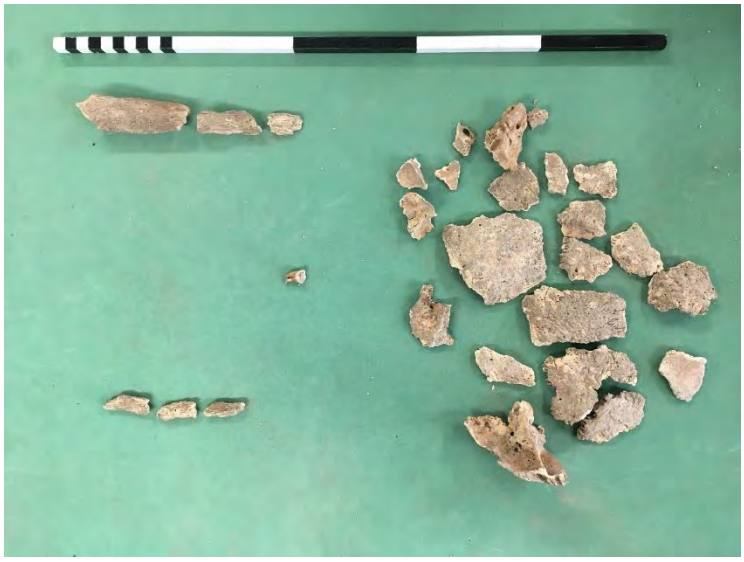
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G266, SK10.1028



Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Mastoid process is scored as male but as it is only surviving feature sex cannot be estimated

Age: 25 - 40?

Possible age range estimate based on single surviving tooth (mandibular 1st molar)

Taphonomy: surface erosion, post-mortem breakage, root etching

Measurements: none

Pathology/Trauma: none

Dental health: moderate wear, no evidence of pathology

Anatomical variations: none

Note: An additional tooth was recovered from flotation of soil samples from this grave. Identified as a lower first or second molar crown (no root surviving). Minimal wear was noted but as the occlusal surface was obscured by dirt and soil staining, which could not be cleaned due to the condition of the enamel, this has not affected the age estimate for this individual.

G267 SK10.1048

(not pictured as just bone dust surviving)

Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion

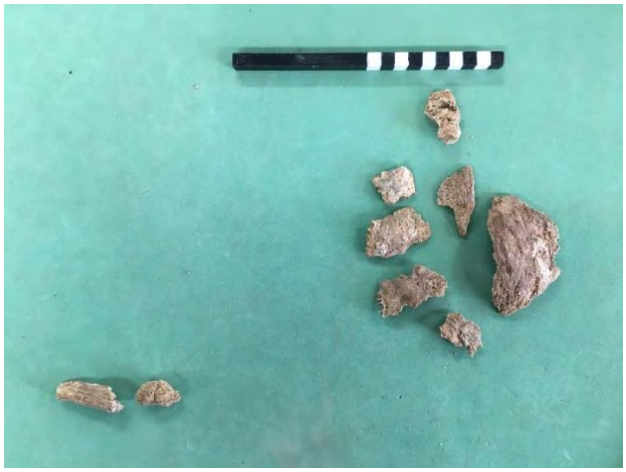
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G268, SK10.0851



Preservation: 5+

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Additional small fragments of this skeleton consisting of cranium, long bone, and trabecular bone were recorded as small finds. See disarticulated bone in report.

Taphonomy: severe surface erosion, post-mortem breakage, soil staining

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G269, SK10.1140

Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G273, SK10.1480

Preservation: 3

Completeness: <5%

Sex: indeterminate

Age: 17 – 25?

Based on dental attrition of only surviving complete crown (lower first molar) so tentative estimate

Taphonomy: post-mortem breakage, some surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: slight wear, no evidence of pathology

Anatomical variations: none

G274, SK10.1221

Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate

Age: 14+

Based on epiphyseal fusion

Taphonomy: surface erosion, post-mortem breakage

Measurements: post-cranial

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: squatting facets observed on left tibia

G275, SK10.1061

Preservation: 4

Completeness: fair (25-50%)

Sex: indeterminate

Age: 17 – 30

Presence of enamel polishing on third molars confirms eruption, individual is at least 17. Based on dental attrition estimate is 17-30. Presence of a fusion scar of the proximal right humerus supports estimate of young adult.

Taphonomy: soil staining, drying cracks, surface erosion, post-mortem breakage

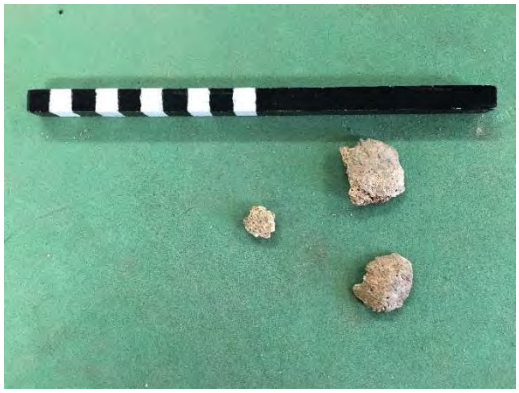
Measurements: post-cranial, stature not estimated

Pathology/Trauma: none

Dental health: linear enamel hypoplasia of mandibular canines and incisors. Wear slight to moderate.

Anatomical variations: none

G276, SK10.1169



Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G277, SK10.1596

Preservation: 5

Completeness: poor

Sex: indeterminate

Age: 25 - 45

Based on dental attrition

Taphonomy: surface erosion, soil staining, root etching

Measurements: none

Pathology/Trauma: none

Dental health: moderate wear, no evidence of dental pathology

Anatomical variations: none

G278 SK10.1624

Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, staining

Measurements: none

Pathology/Trauma: none

Dental health: no teeth present but alveolar bone of mandible shows no antemortem loss or abscess

Anatomical variations: none

G281, SK10.0785 AND SK10.2921

MNI of G281 = 2, dentition of a second individual identified at analysis stage (based on differential dental wear/eruption patterns). Teeth of younger individual SK10.2921 are pictured left. However due to poor preservation it was not possible to assign any other skeletal elements to a specific individual.

Preservation: 5

Completeness: n/a (2 individuals present)

Sex: indeterminate

Age: **(SK10.0785)** 25 – 35, Based on dental attrition

(SK10.2921) 7 – 13, Based on mixed dentition and lack of wear

Taphonomy: soil staining, surface erosion

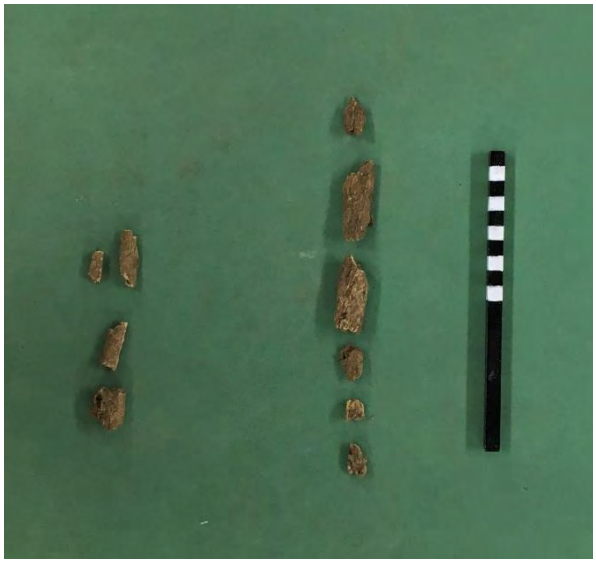
Measurements: none, cortical damage too severe to measure long bone diameters/circumferences

Pathology/Trauma: none

Dental health: slight calculus on lingual surface of molar belonging to older individual SK10.0785

Anatomical variations: Carabelli's cusp on permanent second molar of the younger individual, SK10.2921

G284, SK10.0871



Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G285, SK10.1787

Preservation: n/a (no cortical bone present)

Completeness: <5%

Sex: indeterminate

Age: 5 – 16?

Two premolars with no evidence of wear, but no roots so cannot assess root completion

Taphonomy: n/a

Measurements: none

Pathology/Trauma: none

Dental health: no wear

Anatomical variations: none

G286, SK10.0979

Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate

Age: 14+

Based on long bone epiphyseal fusion

Taphonomy: surface erosion, soil staining, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G287, SK10.0920

Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: soil staining, post-mortem breakage, surface erosion

Measurements: post-cranial

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G287, SK10.0949

Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate

Age: 16+

Based on long bone epiphyseal fusion

Taphonomy: soil staining, post-mortem breakage, surface erosion

Measurements: post-cranial

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G289, SK10.0997

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: 17-25?

Based on dental attrition, however only 6 teeth surviving and wear obscured by caries on some teeth

Taphonomy: post-mortem breakage, soil staining, surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: caries of upper 1st molar and upper canine (canine also has calculus)

Anatomical variations: none

G294, SK10.0544

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: soil staining, post-mortem breakage, surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G294, SK10.0579

Preservation: 4

Completeness: poor (5-25%)

Sex: male?

Morphology of sciatic notch indicates male, but as it is the only diagnostic feature present and is fragmentary, individual is recorded as a possible male

Age: 40 – 60

Based on the appearance of the auricular surface (fragmentary) and dental attrition

Taphonomy: "bleaching" of unknown cause (not UV light) on areas of the cranium, in particular left maxilla. Appears both endo- and ectocranially

Measurements: post-cranial (humerus diameters)

Pathology/Trauma: endocranial lesion, 10mm with and 2.5mm depth with irregular base

Dental health: slight calculus of upper canine and lower third molars.

Anatomical variations: none

G295, SK10.1078

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: post-mortem breakage, surface erosion, soil staining

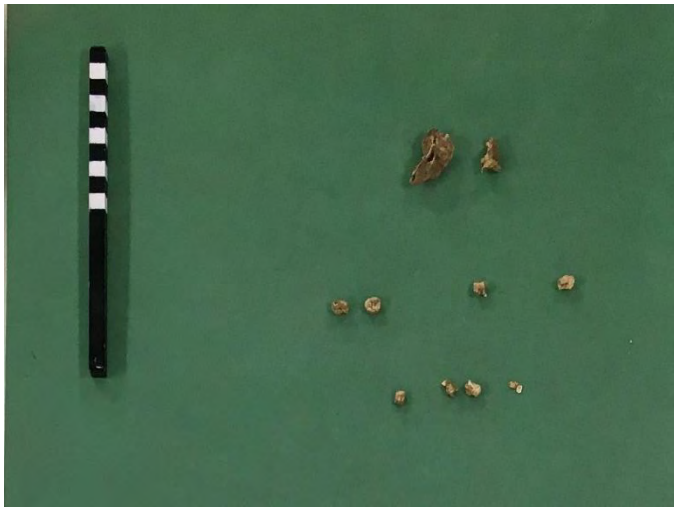
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G296, SK10.1188



Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: 12 – 17

Based on dental attrition and enamel formation.

Taphonomy: enamel fragmentation, surface erosion

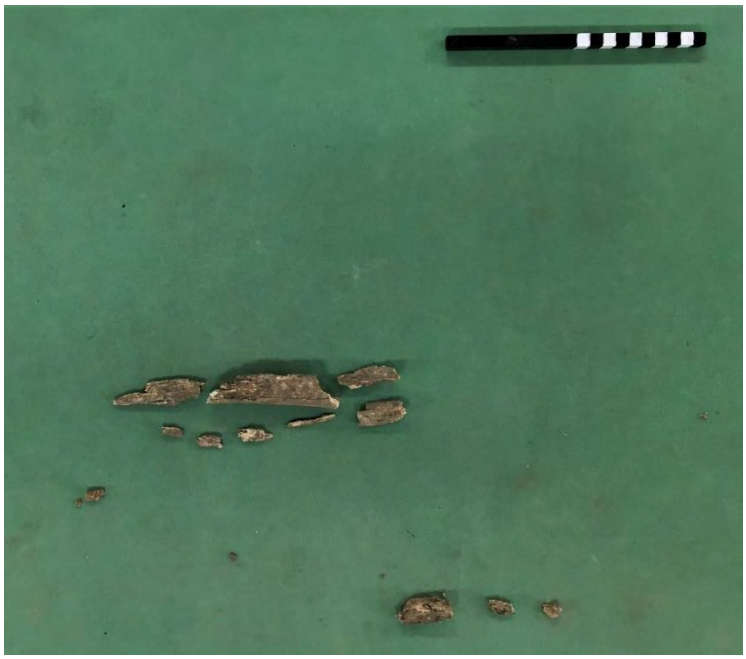
Measurements: none

Pathology/Trauma: none

Dental health: no wear, no evidence of pathology

Anatomical variations: none

G297, SK10.1115



Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: soil staining, surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G298 SK10.1344

Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion

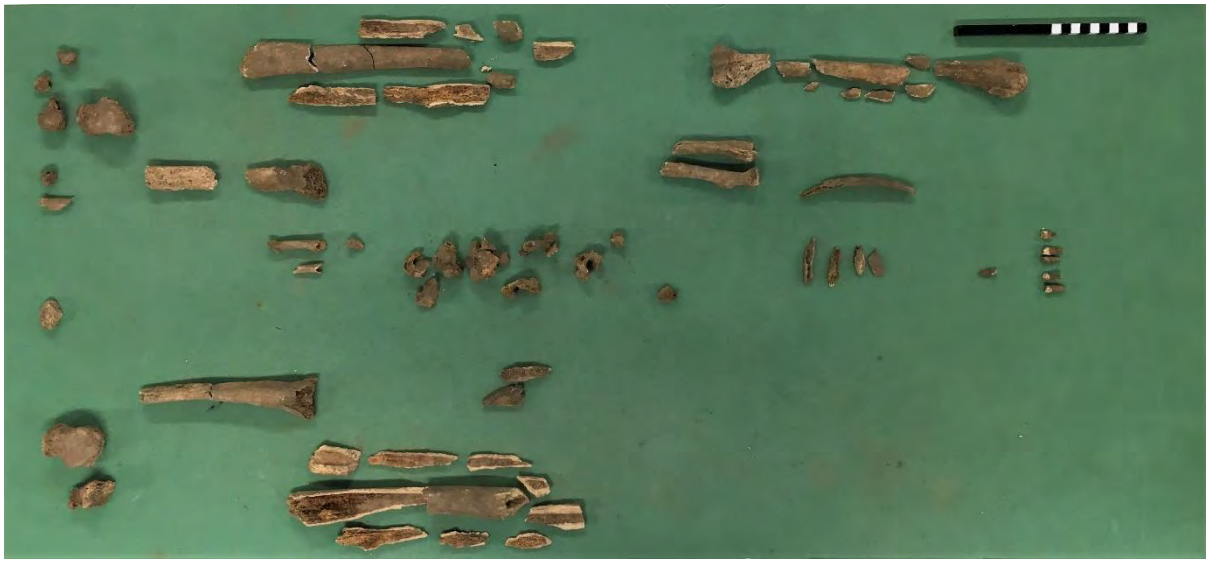
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G299, SK10.1774



Preservation: 3

Completeness: fair (25-50%)

Sex: indeterminate

Age: 18+

Based on fusion of vertebral rings. Estimation based on dental attrition attempted with a result of roughly 24+, but as only incisors and canines present this is not reliable.

Taphonomy: post-mortem breakage, some surface erosion

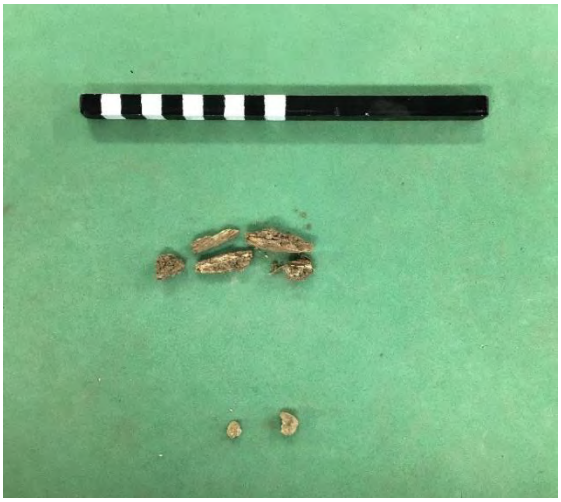
Measurements: none

Pathology/Trauma: none

Dental health: no evidence of adverse dental health, wear moderate

Anatomical variations: none

G301, SK10.1214



Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion

Measurements: none

Pathology/Trauma: none

Dental health: n/a (only two fragments of enamel present)

Anatomical variations: none

G303, SK10.1658

Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G305, SK10.1317

Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate

Age: 17 - 25

Based on dental attrition

Taphonomy: surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: carries of one molar (possibly a lower second molar). Not possible to tell extent of lesion due to enamel fragmentation.

Anatomical variations: none

G308, SK10.1397

Preservation: 3

Completeness: good (50-75%)

Sex: female

Based on morphology of the pelvis and skull, and metrics of glenoid fossa, humerus, femur and tibia

Age: 33 – 35

Based on dental attrition with supporting evidence from cranial suture closure

Taphonomy: post-mortem breakage, soil staining, some surface erosion

Measurements: some cranial and post-cranial measurements available but not those related to stature

Pathology/Trauma: none

Dental health: periodontal disease, antemortem loss of right upper second molar, with associated major abscess. Signs of antemortem loss of upper left first incisor also. Severe calculus of lingual surface of lower left second incisor. Likely that more teeth were affected by calculus which doesn't survive.

Anatomical variations: coracoclavicular joint, small mandibular torus

G309, SK10.1901

Preservation: n/a (no cortical bone surviving)

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: enamel fragmentation, staining

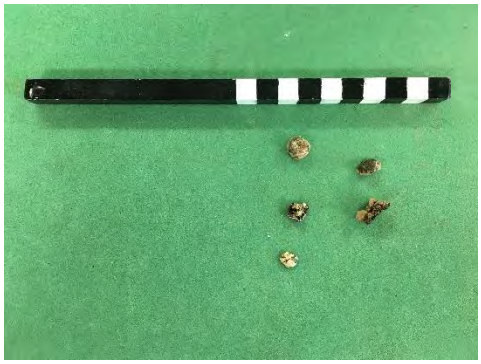
Measurements: none

Pathology/Trauma: none

Dental health: not observable due to fragmentation

Anatomical variations: none

G311, SK10.1932



Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: enamel fragmentation, staining, surface erosion

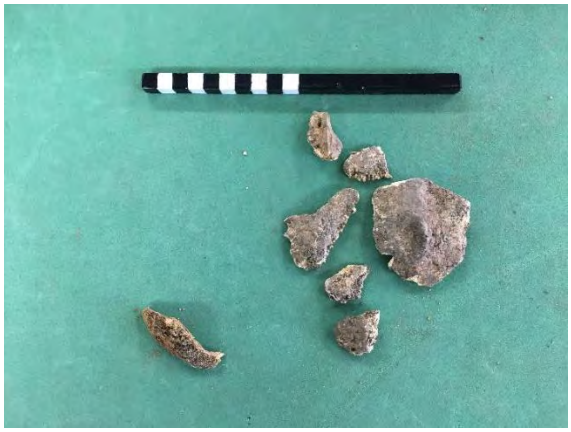
Measurements: none

Pathology/Trauma: none

Dental health: not observable due to fragmentation

Anatomical variations: none

G312, SK10.1900



Preservation: 4

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breakage

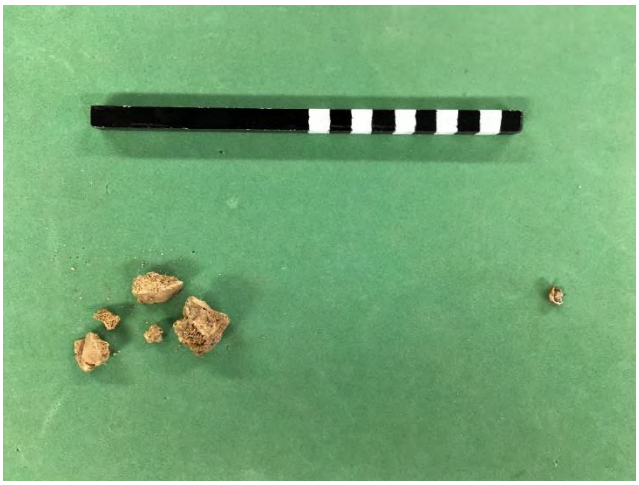
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G341, SK10.1343



Preservation: 5

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, enamel fragmentation

Measurements: none

Pathology/Trauma: none

Dental health: not observable due to fragmentation

Anatomical variations: none

G343, SK10.1632

Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: 16 – 25?

Tentative estimate based on dental wear of two surviving teeth

Taphonomy: soil staining, surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of pathology or non-specific conditions

Anatomical variations: none

G347, SK10.1741

Preservation: 5+

Completeness: poor

Sex: indeterminate

Age: 11+

based on eruption of mandibular second molar, as attrition rates not observable due to taphonomy. Some evidence from cranial sutures suggests the individual is 30+ but this is unreliable

Taphonomy: severe surface erosion, post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: not observable due to taphonomy

Anatomical variations: none

An additional tooth and some enamel fragments were recovered from flotation of soil samples associated with this skeleton. The tooth was identified as a probable upper third molar with no wear. If tooth identification is correct this individual is likely to be 15-25 years of age, however with only one tooth crown surviving there is not enough evidence to provide an estimate.

G348, SK10.1659

not pictured due to extremely poor condition of remains – only unidentifiable fragments <20mm surviving

Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: severe surface erosion

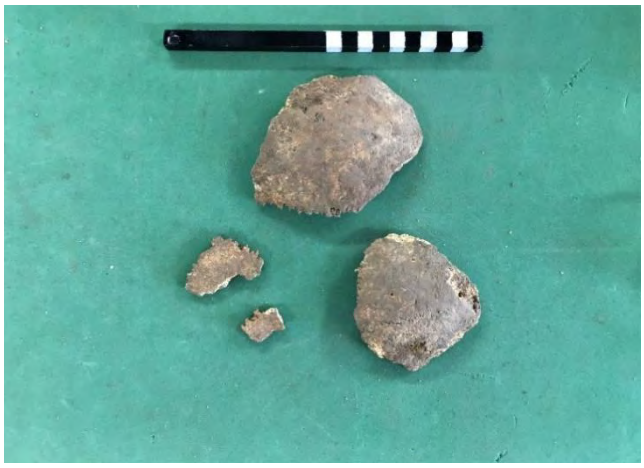
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G366, SK10.1955



Preservation: 5

Completeness: poor (5-25%)

Sex: indeterminate

Age: indeterminate

Taphonomy: surface erosion, post-mortem breakage

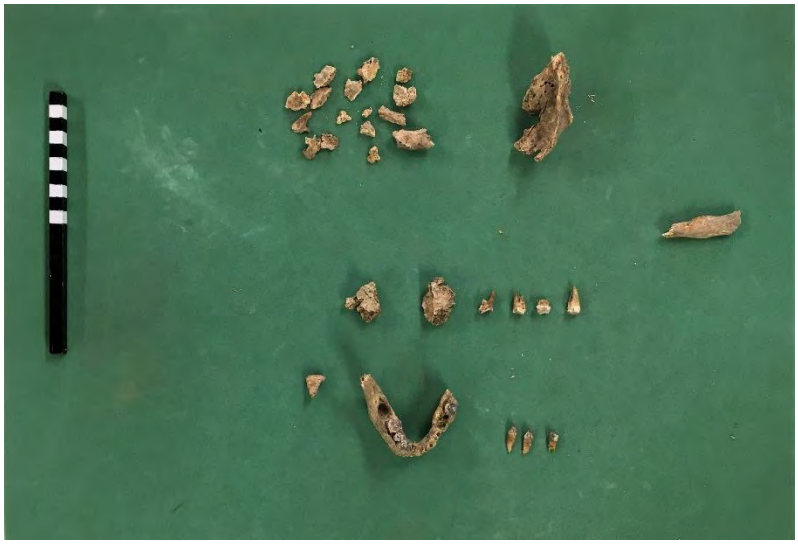
Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G368, SK10.2182



Preservation: 4

Completeness: poor (5-25%)

Sex: indeterminate (juvenile)

Age: 7 – 9

Based on dental eruption

Taphonomy: surface erosion, post-mortem breakage

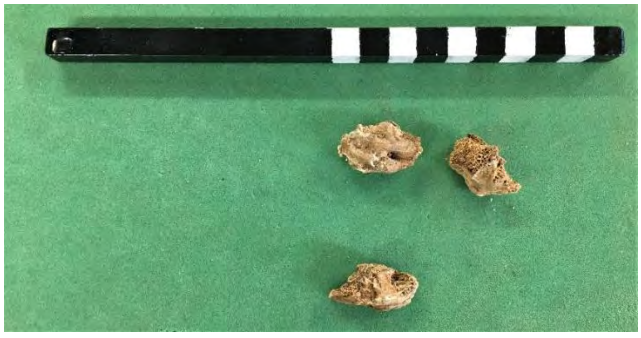
Measurements: none

Pathology/Trauma: none

Dental health: wear of deciduous teeth moderate to severe. Calculus of deciduous teeth; moderate on maxillary molar, and severe on mandibular canine and second incisor

Anatomical variations: none

G387, SK10.2100



Preservation: 4

Completeness: <5%

Sex: indeterminate

Age: indeterminate

Taphonomy: post-mortem breakage

Measurements: none

Pathology/Trauma: none

Dental health: n/a

Anatomical variations: none

G403, SK10.2289

Preservation: 5+

Completeness: <5%

Sex: indeterminate

Age: adult

Two mandibular premolars present with heavy wear indicates this individual is probably a middle-mature adult. However, due to fragmentation cannot provide age range.

Taphonomy: severe surface erosion, soil staining, enamel fragmentation

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of pathology

Anatomical variations: none

G410, SK10.2442

This skeleton consists of 13 teeth recovered from flotation of soil samples. According to site records other teeth were recovered at excavation but were not submitted for analysis with material from grave contexts, presumed missing.

Preservation: n/a

Completeness: <5%

Sex: indeterminate

Age: 17-25

Based on dental attrition

Taphonomy: erosion

Measurements: none

Pathology/Trauma: none

Dental health: no evidence of pathology, slight wear

Anatomical variations: none

APPENDIX 3 - QUANTIFICATION OF ARCHAEOLOGICAL ASSEMBLAGES

Finds quantification

Site	Lithics		Prehistoric pottery		Roman pottery		Post-medieval pottery		Clay Tobacco Pipe		Glass		Slate		Worked stone		Industrial Waste		Fired Clay		Iron		Lead		Copper alloy		CBM		Heated Stone	
	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)	qty	wt(kg)
Area 1	3	0.007																			2	0.004								
Area 2	41	1.509	19	0.048	4	0.050	7	0.124							20	19.494	47	2.383	8	0.049	11	0.740	1	0.017	2	0.025				
Area 3	31	0.329	1	0.005	1	0.005	3	0.010							2	0.393									1	0.001				
Area 4	2	0.023			28	0.215	2	0.008	1	0.002	1	0.060			15	4.046	4	0.232	83	3.965	2	0.062			1	0.010				
Area 5	1	0.007					20	0.352			11	0.112									1	0.335					6	2.932	150	2.932
Area 7	5	0.030					5	0.069			1	0.011	14	104.459	13	17.240	11	0.224	3	0.067	2	0.229					23	0.548		
Area 8															1	0.103														
Area 9			1	0.003	40	0.284					1	0.001			3	3.096			11	0.162	6	0.015			1	0.053				
Area 11																	1	0.005												
Area 12	3	0.016													1	0.283	1	0.004												
Area 13	1	0.003													6	5.203			1	0.018									1	0.035
Area 14	372	3.697	9	0.089			3	0.026							23	5.879			15	0.192										
Area 15	415	5.028	6	0.058	273	4.837	193	2.118	17	0.044	28	0.113	153	1,248.192	161	95.998	682	34.118	168	13.218	286	5.068	19	0.900	59	0.182	3	1.101	11	0.530
Area 16	2	0.003																	11	0.018										
Area 17			1	0.012			1	0.004							3	0.232			1	0.011									1	0.035
Area 18																														
Area 19							1	0.012							1	0.220	1	0.063	1	0.055										
Area 20	27	0.335			87	0.906	33	0.556			1	0.006			113	115.392	22	34.635	350	13.088	14	1.347			9	0.194	3	0.006	150	5.715
Hotspot 5	1	0.078													4	12.515	11	0.018									1	1.770		
Hotspot 6	3	0.027																			1	0.038								
Hotspot 7-9	18	0.268	1	0.003			1	0.001							4	2.046														
Hotspot 8															1	0.031			1	0.042										
Hotspot 10																	11	0.083									11	0.001		
Hotspot 11-13			41	0.375			4	0.036							3	0.041	1	0.001									1	0.005		
Hotspot 12							22	0.443																						
Hotspot 14	3	0.004	14	0.244							1	0.001			1	0.011	1	0.031	1	0.885									1	0.024
Hotspot 15	12	0.178	12	0.094	90	0.772	4	0.027							89	34.607	28	3.551	143	21.128	61	0.682	1	0.036	7	0.075	51	7.354		
Hotspot 16	2	0.778					6	0.158							1	0.037														
Hotspot 17																														
EV9 (all 3 sites)		0.540	800	1.386												3.102						0.101						0.021		
Totals	**942**	**12.86**	**904**	**2.317**	**523**	**7.069**	**305**	**3.9435**	**18**	**0.046**	**44**	**0.304**	**167**	**1,352.651**	**465**	**319.969**	**821**	**75.348**	**654**	**52.898**	**386**	**8.621**	**21**	**0.953**	**80**	**0.54**	**99**	**13.738**	**314**	**9.271**

Ecofact quantification

Site	No. of samples	Weight proc. (kg)	Vol. proc. (litres)	CPR qty	Char. weight (g)	Magnetic (g)	Shell (Flot) count	Shell (Retent) weight (g)	Animal bone cnt	Animal bone weight (kg)
Area 1	7	346	169		227	4				
Area 2	51	1,594	859	299	149	331			690	3.572
Area 3	24	713	359	20	131	37				
Area 4	141	4,387	2,549	500+	365	482				
Area 5	5	285	92		198	28			4	0.132
Area 7	358	26,562	17,242	500+	356	30	2	2		
Area 8	4	175	114		335	4				
Area 9	45	1,049	600	479	183	104	8	1,584	101	0.089
Area 11	4	44	23	9	10	5			4	0.002
Area 12	5	154	88	190	84	7			4	0.003
Area 13	4	135	83		126	2				
Area 14	10	331	183	124	72	15				
Area 16	1	42	25		10	1				
Area 17	3	139	85		13	3				
Area 19	39	1,127	504	2	415	85			1	0.001
Area 20	616	15,301	9,508	500+	2,883	1,925	8	4		
Hotspot 5	47	1,554	986	50	927	51				
Hotspot 8	18	302	233		144					
Hotspot 10	7	248	147		8	8				
Hotspot 6	12	338	244	70	12	11			1	0.002
Hotspot 7-9	88	2,779	1,776	81	1,645	120			1	0.008
Hotspot 11-13	87	4,374	2,843	297	1,188	249	2		1	0.005
Hotspot 14	28	429	296	109	825	51				
Hotspot 15	140	4,011	2,527	500+	45	479			1	0.001
Hotspot 16	7	289	203	12	3					
Wylfa Head Cem	1,041	40,619	25,764	500+	13,548	484	56			
Total	**2,792**	**107,327**	**67,502**		**23,902**	**4,516**	**76**	**1,590**	**808**	**3.815**

APPENDIX 4 - QUANTIFICATION OF THE ARCHIVE

Digital archive quantification

No.	Site name	Context Sheets	Digital context register	Scanned photo reg.	Digital photo reg.	Scanned context reg.	Scanned dwg reg.	SF/Object reg.	Scanned Context sheets	Scanned DWGs	Survey data	Photo format	Monochrome film	Digital photographs	Rectified photographs	Hand drawn plans	Hand drawn sections	GPS survey pre-excavation plans	GPS survey excavation plans	TST surveyed excavation plans	Notes
1	Area 1 (L3 North)	82	Excel sheet W: drive	PDFs W: drive	N.A.	PDFs W: drive	PDFs W: drive	Absent	PDFs W: drive	Absent	.shp		None	224	0	0	46	Yes	Yes	No	
2	Area 2 (L11)	803	Excel sheet W: drive	Absent	N.A.	Absent	Absent	Absent	PDFs W: drive	PDFs W: drive	.shp	JPG	None	2,152	None	76	321	Yes	Yes	Yes	
3	Area 3 (K11)	102 (10 void / unused)	Excel sheet W: drive	PDFs W: drive	N.A.	PDFs W: drive	PDFs W: drive	PDFs W: drive	PDFs W: drive	PDFs W: drive	.shp		None	231	0	0	52	Yes	Yes	No	
4	Area 4 (E3)	1271	Excel sheet W: drive	Absent	N.A.	Absent	Absent	Absent	PDFs W: drive	PDFs W: drive	.shp	JPG	None	3,267	115	56	392	Yes	Yes	No	
5	Area 5 (A+C2:C311)	54 (2 Void)	Excel sheet W: drive	PDFs W: drive	N.A.	PDFs W: drive	PDFs W: drive	Absent	PDFs W: drive	PDFs W: drive	.shp		None	10 JPEG		8 (2 Void)	48 (2 Void)		Yes		
6	Area 7 (A3)	567 (27 voided)/107 (Wessex Archaeology)	Excel sheet W: drive	Absent	N.A.	Absent	Absent	Excel sheet W: drive	PDFs W: drive	Absent	.dwg		None	675 (JPEG)/416 (JPEG - Wessex Archaeology)	200 GB (Areas)/5.38 GB (Features)/191 GB	177	257		1 GB		
7	Area 8 (A9)	37	Absent	Absent	N.A.	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg		None	35 JPEG/35 NEF	1012 (37.4 GB)	1	9		370 KB		
8	Area 9 (F1)	287	Excel sheet W: drive	PDFs W: drive	N.A.	PDFs W: drive	PDFs W: drive	Absent	PDFs W: drive	PDFs W: drive	.shp		None	672	0	46	98	Yes	Yes	No	
9	Area 11 (L1w)	33	Excel sheet W: drive	PDFs W: drive	N.A.	PDFs W: drive	PDFs W: drive	Absent	PDFs W: drive	PDFs W: drive	.shp		None	43	0	0	12	Yes	Yes	No	
10	Area 12 (L1c)	50	Excel sheet W: drive	Absent	N.A.	Absent	Absent	Absent	PDFs W: drive	Absent	.shp		None	67	0	1	13	Yes	Yes	No	
11	Area 13 (L1e)	13	Excel sheet W: drive	PDFs W: drive	N.A.	PDFs W: drive	PDFs W: drive	Absent	PDFs W: drive	PDFs W: drive	.shp		None	4 JPEG		0	9		Yes		
12	Area 14 (L1 north)	101	Excel sheet W: drive	PDFs W: drive	N.A.	PDFs W: drive	PDFs W: drive	PDFs W: drive	PDFs W: drive	PDFs W: drive	.shp		None	131	0	5	40	Yes	Yes	No	
13	Area 15 (L1)	2918 (70 voided)	Absent	PDFs W: drive	Access database	Absent	PDFs W: drive	Excel sheet W: drive	Absent	PDFs W: drive	.dwg	JPG&NEF	None	3526 (JPEG)/3526 (NEF)	515 GB (Areas)/239 GB (Features)/1.20 TB	897	975		43.6 MG		
14	Area 16 (K2)	67 (1 Void)	Excel sheet W: drive	PDFs W: drive	N.A.	PDFs W: drive	PDFs W: drive	Absent	PDFs W: drive	PDFs W: drive	.shp		None	19		9	59			Yes	
15	Area 17 (L2)	44	Excel sheet W: drive	PDFs W: drive	N.A.	Absent	Absent	PDFs W: drive	PDFs W: drive	PDFs W: drive	.shp		None	70	0	0	22	Yes	Yes	No	
16	Area 18 (O6)	9	Excel sheet W: drive	PDFs W: drive	N.A.	PDFs W: drive	PDFs W: drive	Absent	PDFs W: drive	PDFs W: drive	.shp		None	86	0	0	2	Yes	Yes	No	
17	Area 19 (O5n)	183 (*13 void*)	Excel sheet W: drive	Absent	N.A.	Absent	Absent	Absent	PDFs W: drive	Absent	.shp		None	523 – *some missing,* WD68 107 photos not	0	18	64	Yes	Yes	No	
18	Area 20 (O5s)	4681	Excel sheet W: drive	PDFs W: drive	N.A.	PDFs W: drive	PDFs W: drive	Absent	PDFs W: drive	PDFs W: drive	.shp		None	16079	3259	426	1115	0		1	
19	HS 5	100 (11 voided)	Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	208 JPEG/208 NEF	41.6 GB	18	28		1.196 KB		
20	HS 6	55	Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	61 JPEG/61 NEF	0	2	20		487 KB		
21	HS 7/9	230 (10 vided)	Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	244 JPEG/244 NEF	21.3 GB	6	87		4.68 MB		
22	HS 8	55	Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	28 JPEG/28 NEF			21		497 KB		
23	HS 10	34	Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	18 JPEG/18 NEF	0	0	14				
24	HS 11/13	195 (13 voided)	Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	231 JPEG/231 NEF	73.1 GB (Graves)/98.1 GB (Features and Areas)	57	79		3.58 MB		
25	HS12	6	Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	11 JPEG/11 NEF		1	1		6 KB		
26	HS 14	96	Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	304	16.7 GB	29	35		1.27 MB		
27	HS 15	511	Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	724	339.1	55	154		20.859 MB		
28	HS 16	31	Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	21 JPEG/21 NEF	25.9 GB	9	10		740 KB		
29	HS 17		Absent	Absent	Access database	Absent	Absent	Excel sheet W: drive	Absent	Absent	.dwg	JPG&NEF	None	4 JPEG/4 NEF					118 KB		
30	EV9 (3 sites)	242	Absent	Absent	N.A.	Absent	Absent	Absent	Absent	Absent	.shp		None	616	0	153*	153*		4		*total sections and plans lumped toeether in report

wardell-armstrong.com

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

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

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

BRISTOL
Desklodge
2 Redcliffe Way
Bristol
BS1 6NL
Tel: +44 (0)117 203 4477

BURY ST EDMUNDS
Armstrong House
Lamdin Road
Bury St Edmunds
Suffolk
IP32 6NU
Tel: +44 (0)1284 765 210

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

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

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

GLASGOW
24 St Vincent Place
Glasgow
G1 2EU
Tel: +44 (0)141 428 4499

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

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

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

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

International office:

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

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