Parc y Wern, Tufton, Pembrokeshire Watching Brief



Report by: Trysor

For: Mr and Mrs Vaughan

January 2013



Parc y Wern, Tufton, Pembrokeshire Watching Brief

By

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Trysor Project No. 2012/257

For: Mr and Mrs Vaughan

January 2013

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Cover photograph: The topsoil strip of the slurry pit, almost completed.

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Paratowyd yr adroddiad hwn gan bartneriad Trysor. Mae wedi ei gael yn gywir ac yn derbyn ein sêl bendith.

This report was prepared by the Trysor partners. It has been checked and received our approval.

JENNY HALL MIFA Jenny Hall

PAUL SAMBROOK MIFA

Paul Sambrook

DYDDIAD DATE

07/01/2013

Croesawn unrhyw sylwadau ar gynnwys neu strwythur yr adroddiad hwn.

We welcome any comments on the content or structure of this report.

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1. Summary

In July 2012, Trysor undertook a watching brief in a field at SN0108626525 to the southeast of Parc y Wern, Tufton, Pembrokeshire. Whilst being observed by Trysor, the area of a new slurry pit was stripped of topsoil down to natural subsoil, a depth of 0.30m - 0.35m. As well several modern features, a posthole/pit and a pit were excavated and recorded at this level. The posthole contained no dating evidence and its purpose was unknown. The pit, measuring 1.30 metre by 0.9 metres and 0.25 metres deep, was filled with burnt quartz and charcoal. The charcoal consisted of hazel with a few hazelnut fragments and gave a radio-carbon date of CAL BC 3640 to 3520, or the early Neolithic period.

2. Copyright

Trysor hold the copyright of this report and of the paper and digital archive. Further paper copies may be made of this report without gaining permission to reproduce but it must be noted that Figure 3, 4 & 5 include other copyright material and should not be copied.

3. Introduction

Mr DW and BW Vaughan, of Llys yr Awel, Tufton, Clarbeston Road, Pembrokeshire SA63 4TL commissioned Trysor heritage consultants to undertake an archaeological watching brief on groundworks for an agricultural slurry lagoon relating to planning application number: 11/0541/PA.

The proposed location of the agricultural slurry lagoon lay in a field at SN0108626525, to the southeast of the farm complex at Parc y Wern, Tufton, Pembrokeshire.

4. The development

The development consists of an agricultural slurry lagoon, covering an area of $1815m^2$ and 2.5 metres deep, in a pasture field to the southeast of the farm at Parc y Wern.

5. Conditions on the consent

In granting approval for the application, the Local Planning Authority imposed a condition on the outline consent; the condition specifies the actions necessary to mitigate the impact of the development on the archaeological resource.

The develop er shall en sure that a suitably qual ified archa eologist is present du ring the undertaking of any ground works in the deve lopment area, so that an archaeological watching brief can be conducted. The archaeological watching brief will be undertaken to the standa rds laid dow n by the In stitute of Field Archaeo logists. The Local Planning Authority shall be informed in writing, at least two weeks prior to the commencement of the development, of the name of the said archaeologist. Reason: To ensure the recording of any items of archaeological interest to accord with Policy 84 of the Joint Unitary Development Plan for Pembrokeshire (adopted 13 July 2006).

6. Specification

Trysor prepared a specification for the watching brief, see Appendix A.



Figure 1: Location of the watching brief within southwest Wales.



Figure 2: Location of the slurry pit, northeast of Ambleston.



Parc y Wern, Tufton, Pembrokeshire, Watching Brief

7. Historical and Archaeological Overview

A more detailed discussion of the previously recorded archaeology is given in Appendix A, section 4, but the presence of Castell Flemish 400 metres to the northwest of the new slurry pit was the main reason for the watching brief.

8. Methodology

On Thursday 5^{th} July 2012, an area of 60 metres x 35 metres foundation trench was stripped of topsoil down to subsoil using a mechanical excavator and a grading bucket. This process was observed by Trysor.



Figure 3: The area from which topsoil was removed for the slurry pit.

9. Site Stratigraphy

The watching brief was carried out in accordance with the Institute for Archaeologists' *Standard and Guidance for an Archaeological Watching Brief* (Institute for Archaeologists, 2008). The mechanical topsoil strip of the area of the slurry pit was watched by Trysor and the stratigraphy of the site recorded.

9.1 Context Catalogue

Context Number	Depth	Description	Interpretation
001	0.30m-	7.5YR4/3, loam with very	Ploughsoil
	0.35m	occasional small stones	-
002		7.5YR 4/4	Natural subsoil
	-	Silty clay with occasional clay	
003		Fill of 004	Fill of a modern
			water/drainage trench
004		A linear feature cutting through	Modern
		subsoil but cut from higher up.	water/drainage trench
		Confirmed by farmer as being a	
		modern feature and not excavated.	
005		Fill of 005	Fill of a modern
			water/drainage trench
006		A linear feature cutting through	Modern
		subsoil but cut from higher up.	water/drainage trench
		Confirmed by farmer as being a	
		modern feature and not excavated.	
007	0.10m-		Material dumped in a
	0.20m		wet corner of the field
008		Fill of 009	Fill of test pit 009
009			Modern test pit, part of
			the pre-application
			work for the slurry pit
010		Fill of 011	Fill of test pit 011
011			Modern test pit, part of
			the pre-application
			work for the slurry pit
012		Fill of 013	Fill of test pit 013
013			Modern test pit, part of
			the pre-application
			work for the slurry pit
014		Fill of pit 015.	
015		A roughly circular feature seen	A small pit, or
		cutting the subsoil when the	possibly posthole,
		ploughsoil was mechanically	although no postpipe
		removed. The feature was	was visible. Undated
		approximately 0.75 metres in	and purpose unknown.
-		diameter and 0.10 metres deep	
016		Fill of pit 017. A friable gritty loam	
		containing many fragmented quartz	
		blocks (up to 50% of total) and	
		charcoal. Charcoal was sampled, a	
		radiocarbon date obtained by Beta-	
		Analytic and sample analysed. The	
		radiocarbon date was given as CAL	



	BC 3640 to 3520 (4780+-30 BP conventional radiocarbon age), see Appendix C. Analysis of the sample showed it to be hazel with a few fragments of hazel nut (CJ Griffiths, 2012, see Appendix D)	
017	An irregular, oval pit, 1.3 metres by 0.90 metres and 0.25 metres deep from the ploughsoil/subsoil interface.	Neolithic pit containing burnt hazel and quartz blocks.





Figure 4: Location of features recorded after removal of topsoil.

10. Photographs

Colour digital photographs were taken of topsoil stripping and excavation of trenches using a 14M pixel camera. The following table describes the content of each photograph included in the project archive and their locations are provided in the following map, see Figure 4. The photographs are included in Appendix B at the end of the report.

PYW2012_100Stripping off of the topsoil from the southern end of the trench.05/07/2012Looking east.PYW2012_101The southern end of the trench, with layer 007 in the foreground, looking across the area still to be stripped.05/07/2012Looking north northwest.PYW2012_102Stripping of southern end of trench. northwest05/07/2012Looking north northwest.PYW2012_103The southwestern corner of the trench, showing water pipes 004 and 006 cutting layer 007.05/07/2012Looking morth northwest.PYW2012_104Layer 007 in the southwestern corner of the trench.05/07/2012Looking north northwest.PYW2012_105Posthole or pit 015 before half- sectioning05/07/2012Looking north.PYW2012_106Position of posthole or pit 015, with the line of the trench for water pipe 004 in the background to the left.05/07/2012Looking north.PYW2012_107Posthole or pit 015 after half- sectioning.05/07/2012Looking north.PYW2012_109Pit 017 after partial removal of some of the quartz blocks excavation.05/07/2012Looking north.PYW2012_110Pit 017, after partial excavation with the pile of removed quartz to its southwest.05/07/2012Looking north.PYW2012_111Pit 017, after partial excavation, with the pile of removed quartz to its southwest.05/07/2012Looking north.PYW2012_111Pit 017, after partial excavation, with the pile of removed quartz to its southwest.05/07/2012Looking north.	Photo Number	Description	Date Taken	Direction
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PYW2012_111 Pit 017 after partial excavation, 05/07/2012 Looking southeast.		its southwest.		
	PYW2012_111	Pit 017 after partial excavation,	05/07/2012	Looking southeast.
snowing charcoal with some of the		showing charcoal with some of the		
quartz still in situ.		quartz still in situ.		
PYW2012_112 Pit 017 after further excavation05/07/2012Looking northwest.	PYW2012_112	Pit 017 after further excavation	05/07/2012	Looking northwest.
showing the continuation of the		showing the continuation of the		
charcoal.		charcoal.		
PYW2012_113 Pit 017 after total excavation with 05/07/2012 Looking north	PYW2012_113	Pit 017 after total excavation with	05/07/2012	Looking north
the quartz removed piled alongside. northwest.		the quartz removed piled alongside.		northwest.
PYW2012_114 Close up shot of the pit 017 after 05/07/2012 looking north	PYW2012_114	Close up shot of the pit 017 after	05/07/2012	looking north
total excavation. northwest.		total excavation.	05/05/2012	northwest.
PYW2012_115 Pit 01 / after total excavation with 05/01/2012 Looking northeast.	PYW2012_115	Pit UI / after total excavation with	05/07/2012	Looking northeast.



PYW2012_116	Ranging rods showing the location	05/07/2012	Looking north
	of posthole/pit 015 (to the left) and		northwest.
	pit 017 (further back to the right),		
PYW2012_117	The whole trench after stripping of	05/07/2012	Looking north
	the topsoil.		northwest.
PYW2012_118	Pit 017 in the foreground, showing	05/07/2012	Looking south.
	the rest of the trench.		



Figure 5: Location of photographs

11. Discussion

The Neolithic in northern Pembrokeshire is largely understood through the chambered tombs which characterise the period in this area as shown by an online search of Archwilio for the Neolithic in Pembrokeshire, returning 73 sites of which 51 are Chambered Tombs.

There are known Neolithic chambered tombs a little over 3km to the west and northwest of Parc y Wern, at Garn Turne (Dyfed Archaeological Trust PRN 2409), Parc y Llyn (PRN 2416) and Colston (PRN 2412). These cromlechs are all protected as Scheduled Ancient Monuments.

The nearest significant non-funerary Neolithic site to Parc y Wern is the Banc Du Enclosure (PRN 14383), just 6.5km to the northeast. This is the first and, hitherto, only example of a Neolithic enclosure discovered in Wales (Darvill et al, 2006). A small excavation across the bank and ditch of the Banc Du enclosure was carried out in 2005 and radiocarbon dating showed that silts began infilling the ditch as early as 3650BC. Examination of pollen evidence from the ancient land surface buried beneath the enclosure bank showed that when the enclosure was first built there was a heath-dominated landscape with some oak and hazel scrub in the surrounding area.

The quartz-filled pit uncovered at Parc y Wern, context 017, was 1.30 metres long by 0.90 metres wide and 0.25 metres as excavated. It contained hazel charcoal and burnt quartz blocks and was dated to the Early Neolithic period, CAL BC 3640 to 3520. This date is comparable to that of the earliest phase of activity at Banc Du and the discovery of the pit points to a Neolithic presence across the wider area.

Early Neolithic pits were the subject of a seminar in 2009 and a subsequent publication (Anderson-Whymark, H & Thomas, J, 2012) to discuss this distinctive but often overlooked Neolithic feature. It included a paper on recently recorded Neolithic pits in Carmarthenshire, uncovered during the archaeological work during construction of a gas pipeline (Pannett, A, 2012). Three separate clusters were recorded in the Tywi Valley, at Cilsan, Pen-y-banc and Cwmifor. Each cluster varied from the others in detail but they generally conformed to the description of a roughly circular pit, with a shallow bowl-shaped profile and a single charcoal rich fill. This general description is also true of the Parc y Wern pit. It differs from those described in Carmarthenshire in that the charcoal was only hazel, whereas the Carmarthenshire examples also included oak and alder, and the burnt quartz blocks. The purpose of the Parc y Wern pit, as with so many other Neolithic pit is not clear, but it is likely is that similar pits may survive nearby. Whether the shallower pit discovered on site, context 015, is in any way associated is unknown.

12. Conclusion

Most features were of a recent date: two water pipe trenches, 004 and 006, three test pits connected with pre testing for the slurry pit 009, 011, 013. A stone layer in the southwest corner of the trench was cut by the two water pipe trenches but was in a wet part of the field and appeared to be material deposited to patch up the damp area.

Two features of archaeological interest were recorded. A posthole or small pit was fully excavated but provided no dating evidence or purpose. A second pit was fully excavated and contained a large quantity of burnt, cracked quartz blocks and charcoal. A sample of the charcoal, which was hazel, with a few hazelnut shell fragments, gave a calendar age of CAL BC 3640 to 3520.

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13. Archive

The archive and a copy of the report and photographs will be deposited with the National Monuments Record, Aberystwyth. Photographs are in TIFF format, following the standard required by the RCAHMW.

Further copies of the report have also been supplied to Mr & Mrs Vaughan, and the Historic Environment Record at Dyfed Archaeological Trust, Llandeilo.

14. Sources

14.1 Published sources

Anderson-Whymark, H & Thomas, J, 2012, *Regional Perspectives on Neolithic Pit Deposition, Beyond the Mundane*, Oxbow Books

Darvill, T., 2006, "The Strumble-Preseli Ancient Communities and Environment Study (SPACES); Fifth Report, 2006" in *Archaeology in Wales, Vol. 46*, p.105. CBA Wales.

Pannett, A., 2012, *Pits, pots, and plant remains: trends in Neolithic deposition in Carmarthenshire, South Wales* pp126-143 in Anderson-Whymark, H & Thomas, J, 2012

14.2 Unpublished sources

Beta Analytic, 2012, Report of Radiocarbon Dating Analyses, Beta 326247

Griffiths, CJ, 2012, Parc y Wern Tufton, Pembrokeshire

14.3 If A Standard and Guidance

Institute for Archaeologists, 2008 (revised), Standard and Guidance for an Archaeological Watching Brief, available online from the IfA website, <u>www.archaeologists.net</u>

14.4 Online Sources

Archwilio – Online access to regional Historic Environment Record (HER) for Pembrokeshire, <u>www.archwilio.org.uk</u> (Primary Reference Numbers or PRNs of sites recorded in the HER are provided in point 11).

APPENDIX A – Watching Brief Specification

PARC Y WERN FARM SLURRY LAGOON, TUFTON, PEMBROKESHIRE ARCHAEOLOGICAL WATCHING BRIEF SPECIFICATION

Planning permission - 11/0541/PA

1. Introduction

Mr DW and BW Vaughan, of Llys Yr Awel, Tufton, Clarbeston Road, Pembrokeshire SA63 4TL have commissioned Trysor heritage consultants to undertake an archaeological watching briefs on groundworks for an agricultural slurry lagoon relating to planning application number: 11/0541/PA.

The proposed location of the agricultural slurry lagoon lies in a field at SN0108626525, to the south of the farm complex at Parc y Wern, Tufton, Pembrokeshire.

2. The development

The development consists of an agricultural slurry lagoon, covering an area of $1815m^2$ and 2.5 metres deep, in a pasture field to the southeast of the farm at Parc y Wern.

3. Conditions on the consent

In granting approval for the application, the Local Planning Authority imposed a condition on the outline consent; the condition specifies the actions necessary to mitigate the impact of the development on the archaeological resource.

The develop er shall en sure that a suitably qual ified archa eologist is present du ring the undertaking of any ground works in the deve lopment area, so that an archaeological watching brief can be conducted. The archaeological watching brief will be undertaken to the standa rds laid dow n by the In stitute of Field Archaeo logists. The Local Planning Authority shall be informed in writing, at least two weeks prior to the commencement of the development, of the name of the said archaeologist. Reason: To ensure the recording of any items of archaeological interest to accord with Policy 84 of the Joint Unitary Development Plan for Pembrokeshire (adopted 13 July 2006).

4. Nature of the archaeological resource

Four hundred metres to the northwest of the proposed location of the agricultural slurry lagoon lies Castell Flemish, a Scheduled Ancient Monument, PE058.

Castle Flemish is a rare example of an attested settlement site of the Roman period in Pembrokeshire. Minor excavations carried out here in 1922 showed that the squarish enclosure was defined by a broad earth rampart, up to 6 metres wide with stone walling on its outer face, separated from a 4 metre wide ditch by a metre with berm. Within the enclosure evidence for at least one timber-framed, slate-roofed building was excavated. The slates were hexagonal in shape, which is a typical Roman characteristic. This structure had a clay floor, over a cobbled base. Sherds of late 1st century or early 2nd century AD Roman Samian ware pottery were found beneath the floor. Terracotta flue tiles and bricks were also found, which suggest that a hypocaust heating system was present at the site. In the early 19th century, Richard Fenton noted that he saw "Roman brick and cement" here, as well as a possible Roman milestone nearby. The little evidence which has been recorded seems to confirm that Castell Flemish was a Roman site, and it is now thought likely that it



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was an enclosed villa or farmstead, rather than a small fortification. The site is divided in two by a minor road. The northern part of the enclosure lies within Puncheston Community, the southern part (where the 1922 excavations took place) in Ambleston Community.

5. Field methodology

The watching brief will be carried out in accordance with Institute for Archaeologists' *Standard and Guidance for an Archaeological Watching Brief.*

A two-person team will examine the exposed stratigraphy of the groundworks undertaken in association with the development. All trenches will be examined and features of archaeological interest recorded. Excavation of any features will be limited to that necessary to establish their extent and character, unless their excavation is required to allow the development to proceed.

6. Contingency arrangements if archaeological features are discovered

In the event that archaeological remains are encountered, where appropriate investigation falls outside the scope of this watching brief specification, a meeting between Trysor, the applicant, Dyfed Archaeological Trust Heritage Management Section and the Local Planning Authority case officer will be convened in order to agree a course of action. The applicant will be responsible for paying for any further work necessary.

7. Health & Safety

Trysor will undertake a risk assessment in accordance with their health and safety policy.

8. Recording

A plan of the groundworks, and representative sections if appropriate, will be drawn, at an appropriate scale, recording all features of archaeological interest. The plan will be based on the applicants' survey drawings of the development area.

A written record of all activity will be kept in a project specific notebook. If archaeological contexts are encountered they will be recorded following the *Central Excavation Unit Manual: Part 2: Recording*, 1986, using a consecutive numbering system.

Any artefacts will be dealt with in accordance with the guidance provided in the Institute for Archaeologists *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials*. Any artefacts will be retained, cleaned and stored. Following reporting they will be returned to the applicant.

Should any human remains be encountered, the Coroner and Regional Archaeological Trust will be immediately informed and the remains left *in situ*.

Colour digital photographs will be taken, as appropriate, using a 14M pixel camera. A written record will be made on site of the photographs taken. Appropriate photographic scales will be used.

9. Reporting

A report on the watching brief will be prepared according to the requirements of Annexe 1 of the Institute for Archaeologists' *Standard and Guidance for an Archaeological Watching Brief* following the completion of the work. Copies of the report will be provided to the client, the Regional Historic Environment Record and the National Monuments Record.

10. Dissemination

A summary of the work undertaken and its findings will be submitted to *Archaeology in Wales*.

11. Archive

The paper archive will be deposited with the National Monuments Record, including a copy of the final report. This archive will include all written, drawn and photographic records relating directly to the investigations undertaken. Photographs will be supplied in TIFF format in a file size greater than 11MB, following the standard required by the RCAHMW.

12. Resources to be used

Two members of staff will undertake the watching brief. They will be equipped with standard field equipment, including digital cameras, GPS and first aid kits.

Trysor have access to the computer hardware and software required to deliver the completed final report and archive to a professional standard.

13. Qualification of personnel

Trysor is a Registered Organisation with the Institute for Archaeologists and both partners are Members of the Institute for Archaeologists, <u>www.archeologists.net</u>.

Jenny Hall (BSc Joint Hons., Geology and Archaeology, MIfA) had 12 years excavation experience, which included undertaking watching briefs prior to becoming the Sites and Monuments Record Manager for a Welsh Archaeological Trust for 10 years. Since 2004 she has been an independent archaeologist undertaking a variety of work that includes upland survey, desktop assessments and watching briefs.

Paul Sambrook (BA Joint Hons., Archaeology and Welsh, MIfA, PGCE) has extensive experience as a fieldworker in Wales. He was involved with Cadw's pan-Wales Deserted Rural Settlements Project for 7 years. He also undertook Tir Gofal field survey work and watching briefs. Since 2004 he has been an independent archaeologist undertaking a variety of work that includes upland survey, desktop assessments and watching briefs.

14. Insurance & Professional indemnity

Trysor has Public Liability and Professional Indemnity Insurance.

15. Project identification

The project has been designated Trysor Project No. 2012/257

Jenny Hall & Paul Sambrook Trysor July 2012



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APPENDIX B



Plate 1: PYW2012_100, Stripping of the southern end of the trench, looking east.



Plate 2: PYW2012_101, The southern end of the trench, with layer 007 in the foreground, looking north northwest, across the area still to be stripped.



Plate 4: PYW2012_103, The southwestern corner of the trench, showing waterpipe trenches 004 and 006 cutting layer 007, looking north northwest.



Plate 6:PYW2012_105, Posthole or pit 015, looking north.



Plate 7: PYW2012_106, Position of posthole or pit 015, with the line of the water pipe trench 004 in the background to the left, looking north.



Plate 8:PYW2012_107, posthole or pit 015 after half-sectioning, looking north.



Plate 9: PYW2012_108, Trowelling around pit 017, prior to excavation, looking north.



Plate 10: PYW2012_109, pit 017 before excavation, looking northwest.



Plate 12: PYW2012_111, pit 017 after partial excavation, showing charcoal with some of the quartz still in situ, looking southeast.



Plate 13: PYW2012_112, pit 017 after further excavation showing continuation of charcoal, looking northwest.



Plate 14: PYW2012_113, pit 017 after total excavation with the quartz removed piled alongside, looking north northwest.



Plate 16:PYW2012_115, Pit 017 after total excavation with the quartz removed from the pit, looking northeast.



Plate 17: PYW2012_116, Ranging rods showing the location of posthole/pit 015 (to the left) and pit 017 (further back to the right), looking north northwest



Plate18: PYW2012_117, The whole trench after stripping of the topsoil, looking north northwest.



Plate 19: PYW2012_118, Pit 017 in the foreground, showing the rest of the trench, looking south.

Appendix C – Wood Identification from Charcoal sample from fill 016

Parc y Wern, Tufton, Pembrokeshire C. J. Griffiths

The sample from Parc y Wern comprised of a small (200ml) soil sample for wood charcoal identification.

The sample was sieved on 250um mesh to remove the excess soil and to make the retrieval of identifiable charcoal easier. The sample was dried oven night at low temperature in a drying oven. It was sorted using a Wild M15 stereomicroscope, all identifiable charcoal and any other identifiable plant remains were removed. The charcoal was then identified under higher magnification using aLEICA DMRmicroscope; the methods used to identify the charcoal correspond to those described in Schweingruber (1978)

The sample contained 3 large fragments of charcoal and numerous smaller fragments, overall 25 pieces were identifiable, the rest of the charcoal becoming too small for identification. All the charcoal identified was of one species, hazel, (*Corylusavellana* L.). The sample also contained two hazelnut shell fragments.

Sample	Species	
Parc y Wen	Corylusavellana L.	25
	(Hazel) - charcoal	
	Corylusavellana L.	2
	Nut shell fragments	

The presence of hazel charcoal and nutshell fragments is a common feature of Neolithic contexts throughout Northern Europe; the wood may have been managed by coppicing and used for building materials or fuel. The nutshell may indicate deliberate use of hazelnuts as a food source or the accidental gathering of the nuts along with firewood.

References

Schweingruber, F.H. 1978 Microscopic Wood Anatomy

Parc y Wern, Tufton, Pembrokeshire, Watching Brief

Appendix D - Beta Analytic report on Radiocarbon Dating Analyses



Consistent Accuracy Delivered On-time Beta Analytic Inc. 4985 SW 74 Court Miami, Florida 33155 USA Tel: 305 667 5167 Fax: 305 663 0964 Beta@radiocarbon.com www.radiocarbon.com

Darden Hood President

Ronald Hatfield Christopher Patrick Deputy Directors

August 15, 2012

Ms. Jenny Hall Trysor 38, New Road Gwaun-cae-Gurwen Ammanford Carmarthenshire, Wales SA18 1UN United Kingdom

RE: Radiocarbon Dating Result For Sample PARCYWERN001

Dear Ms. Hall:

Enclosed is the radiocarbon dating result for one sample recently sent to us. It provided plenty of carbon for an accurate measurement and the analysis proceeded normally. The report sheet contains the method used, material type, and applied pretreatments and, where applicable, the two-sigma calendar calibration range.

This report has been both mailed and sent electronically. All results (excluding some inappropriate material types) which are less than about 20,000 years BP and more than about ~250 BP include a calendar calibration page (also digitally available in Windows metafile (.wmf) format upon request). Calibration is calculated using the newest (2004) calibration database with references quoted on the bottom of the page. Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric 14C contents at certain time periods. Examining the calibration graph will help you understand this phenomenon. Don't hesitate to contact us if you have questions about calibration.

We analyzed this sample on a sole priority basis. No students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analysis. We analyzed it with the combined attention of our entire professional staff.

Information pages are also enclosed with the mailed copy of this report. If you have any specific questions about the analysis, please do not hesitate to contact us. Someone is always available to answer your questions.

The cost of the analysis was charged to the MASTERCARD card provided. A receipt is enclosed. Thank you. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

arden Hood

DR. M.A. TAMERS and MR. D.G. HOOD

4985 S.W. 74 COURT MIAMI, FLORIDA, USA 33155 PH: 305-667-5167 FAX:305-663-0964 beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Ms. Jenny Hall

Trysor

BETA

Report Date: 8/15/2012

Material Received: 7/18/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 326247 SAMPLE : PARCYWERN001 ANALYSIS : AMS Standard deliver	4800 +/- 30 BP	-26.5 o/oo	4780 +/- 30 BP
MATERIAL/PRETREATMENT : (0 2 SIGMA CALIBRATION : C	charred material): acid/alkali/acid Cal BC 3640 to 3520 (Cal BP 5590 t	o 5470)	

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS



Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • E-Mail: beta@radiocarbon.com