APPENDIX 11: ASSESSMENT OF GEO-ARCHAEOLOGY

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1. Introduction

Three monolith samples were recovered from three separate segments of the inner and outer ring ditches during excavation works.

For each section sampled, a monolith tin (500mm x 50mm x 500mm) was hammered into the cleaned section face. The sediments and stratigraphy visible in section were described and drawn by the excavators on site. The monolith locations were marked on the section drawing and a level, related to Ordnance Datum was taken on the top of each tin. Each tin was wrapped in cling film and plastic bags, labelled and stored in a cold store prior to assessment.

Methodology

The sediments sampled in each tin were cleaned and described using standard sedimentary criteria. This attempts to characterise the visible properties of each deposit, in particular relating to its colour, compaction, texture, structure, bedding, inclusions, clast-size and dip.

For each profile, every distinct unit was given a separate number and the nature of the contacts between each unit noted. Where several units appear to be part of the same depositional phase or event they have been grouped into a larger unit [indicated by a letter]. These units are related to the contexts identified on site in the profile description tables (Table 21, Table 22 and Table 23). Where possible in section 4 the profiles are discussed in terms of the context numbers as opposed to the units identified in the monolith tins.

Quantification

Sample <31>: section 3

This sample was taken from the north east part of the outer ditch, through contexts [10] and [39].

Table 21: Assessment of Geo-Archaeology: Sample <31> Section 3

Context	Zone & unit	elevation of contact (m OD)	description and contacts	Related samples
		47.80	Top of sequence sampled	
10	A1	[0.17m thick]	Dark yellowish brown 10YR4/6 slightly sandy clay silt. Moderately abundant, poorly sorted subangular flint inclusions of 10-50mm diameter. Manganese or charcoal speckles throughout. Hard and compact. Diffuse contact to:	<8>
10	A2		Dark yellowish brown 10YR4/4 slightly sandy clay silt. More clayey and darker than unit A1. Manganese or charcoal speckles throughout. Hard and compact.	<8>
		47.57	Sharp contact	
39	B		Yellowish brown 10YR5/8 sandy clay-silt. Very abundant angular to sub-rounded chalk clasts, commonly c. 10mm diameter. Very occasional large (>50mm) sub-angular and small rounded flint pebbles. In basal 0.06m of unit the matrix appears to contain chalk grit and there is a big increase in chalk grit and granules. Hard and compact.	<10>
		47.30	Base of profile sampled	

Sample <32> Section 4

This sample was taken from the eastern part of the inner ditch, through contexts [37] and [17]. The sequence sampled was only 0.25m long (the length of half a monolith tin).

Table 22: Assessment of Geo-Archaeology: Sample <32> Section 4

Context	Zone & unit	elevation of contact (m OD)	description and contacts	Related samples
		48.84	Top of sequence sampled	
37	A1	[0.09m thick]	Dark yellowish brown 10YR4/4 slightly sandy very clayey silt. Frequent angular to sub angular flint clasts, often burnt, especially towards base of unit. Moderately loose and crumbly. Diffuse contact to:	
17	A2	[0.16m thick]	Dark yellowish brown 10YR4/6 very slightly sandy clayey silt. Marked from unit above by fewer flints, more compact structure, paler more orange colour and very occasional chalk grit and speckles.	
		48.59	Base of profile sampled	

Sample <33>: section 7

This sample was taken from the eastern part of the outer ditch, through context [62].

Table 23: Assessment of Geo-Archaeology: Sample <33> section 7

Context	Zone & unit	elevation of contact (m OD)	description and contacts	Related samples
		49.17	Top of sequence sampled	
62	A1	[0.27m	Dark yellowish brown 10YR4/4 slightly sandy	

		thick]	clayey silt. Compact and hard. Occasional poorly sorted flint clasts increase with depth. Manganese speckles occur throughout.	
	A2	[0.16m thick]	Dark yellowish brown 10YR 4/6 slightly sandy clayey silt. Very occasional flint granules. More orange and less stoney than A1. Large root channel tapers towards base of unit. Possible slight increase in clay content and darkening of colour towards base.	
		48.74	Sharp irregular contact	
3	B	[0.07m thick]	White 10YR8/1 chalky silt. Abundant very poorly sorted chalk clasts.	
		48.67	Base of profile sampled	

Provenance

1.1 Monolith samples <31 and 33> are both from the outer ditch. In both samples the lowest fill was chalky with frequent chalk gravel and the overlying fill was decalcified.

1.2 The lowest contexts may reflect the initial weathering of the chalk ditch sides, probably quite soon after the construction of the ditch. In context [39] the matrix becomes more chalky towards the base of the ditch. Upwards in this context, the matrix becomes browner and chalk inclusions fewer.

1.3 This is likely to be a result of the stabilisation and plant / grass growth over the sides of the ditch, together with the weathering of the chalky primary fill. Such weathering, resulting from rainfall, plant growth and animal activities will have dissolved the chalky matrix and chalk rubble inclusions. In addition the accumulation of leaves, dust, eroded soil etc within the interstices of the chalk rubble will have led to a gradual accumulation of the decalcified matrix.

1.4 The upper contexts [10] in monolith <31> and [62] in monolith <33> were subdivided into an upper and lower unit. In monolith <31> the lowest part of context [10] was more humic, darker and slightly more clayey than the upper part. Whereas in monolith <33> the lower part of context [62] was possibly lighter and less stoney than the upper part of the context. In addition in this sample a concentration of flint gravel occurred between A1 and A2 (the upper and lower parts of context [62]).

1.5 It is possible that these characteristics represent an initial period when soil from the banks and ditch surroundings gradually accumulated in the ditch and a later period when more severe erosion was taking place either on the ditch sides or surrounding landsurface.

1.6 It is possible that this might indicate that initial landuse around the barrow was slight or possibly consisted of animal grazing and that subsequent local activities may have involved ploughing or re-use of parts of the barrow, which dislodged coarser gravel material.

1.7 As the later fills were decalcified it suggests that considerable weathering of the chalk had probably already taken place by this time. This might imply that the outer ditch infilled very slowly.

1.8 Manganese speckles within the ditch fills indicate that the environment within the ditch was likely to have been damp.

1.9 The nature and significance of the processes leading to the infilling of the ditch are likely to be better understood if soil micromorphological analysis is undertaken on the samples.

1.10 Pollen is likely to be preserved in the upper decalcified ditch fills. Pollen analysis may provide useful information on the changing landscape and landuse around the barrow for the period after its construction. Such information should provide a better understanding of the setting, visibility and context of the monument both to the people who constructed it and to following occupants of the area.

1.11 Monolith sample <32> was taken through the inner ditch. In this location there was no chalky primary fill and the ditch and fills were shallow and decalcified.

1.12 This is likely to be the result of weathering of the shallower inner ditch, which has left only a few chalk grit fragments in the lower fill [17].

1.13 The upper fill [37] was reddened with shattered burnt flints and may be the result of an *in situ* burning event, which scorched and transformed the pre-existing fill.

1.14 Soil micromorphological analysis might enable microscopic components of the materials burnt within the ditch to be identified.

Conservation

1.15 If thin sections are made of the monolith blocks they will take up less storage space, stand a better chance of long term preservation and be amenable to a similar method of archiving to that for finds and environmental samples. As monoliths the samples are not easily stored, need to be kept in a cool to cold and dark environment and will be likely to deteriorate with time. In addition thin sections are easily available for further research and can be examined frequently without loss of information. Stored monoliths are less accessible and will gradually loose their potential for preserving information, especially as each time they are examined further cleaning will wear away the surface.

1.16 In the same way, processed sub-samples taken from the monoliths will be easier to store and less likely to deteriorate than the original soil material.

1.17 Long term storage as monolith samples is likely to be costly and is not an efficient use of space or archive material.

Comparative material

1.18 The evidence from further analysis of the monoliths should be compared to other evidence for the changing environment during the Bronze Age and Romano-British periods in the North Downs area and further afield. This will enable a better understanding of the exploitation and modification of the landscape by Bronze Age and later societies to be gained.

1.19 The snail sequence and pollen from the monolith samples from the Bronze Age ring-ditch on Cobham Golf Course (ARC CGC 98) should provide good comparative material relating to the infilling of a similar feature and timeframe. Comparative material will also include the colluvial sequences sampled during CTRL investigations in many of the North Downs sites.

1.20 Also published or otherwise available accounts of soil, pollen and snail evidence from buried soils and valley sediments in other parts of south-east England (eg: Godwin 1962; Thomas, 1989; Allen 1995; Preece & Bridglend 1998; Waller 1998; Waller and Hamilton 1998).

Potential for further work

1.21 The data from the monolith samples has potential to address the following landscape Zone and fieldwork aims:

- To study the natural landscape, its geomorphology, vegetation and climate, as the context within which the archaeological evidence can be interpreted.

- Farming communities (2000 BC-100 BC): to consider environmental change resulting from landscape organisation and re-organisation.

1.22 These aims may be achieved by pollen and soil micromorphological analysis of the ditch fills.

1.23 Pollen analysis should enable the nature of the changing landscape during and after the construction of the barrow (in the period of c 2000 to 1600 BC) to be reconstructed and soil micromorphology should enable the sequence of events that led to the infilling of the ditch to be unravelled.

1.24 Recommendations for further work on the monolith samples

task	requirement
Preparation and analysis of 16 pollen samples (*): • 5 at c. 0.40mm intervals through units A1 and A2 in <31> • 11 at c.40mm intervals through units A1 and A2 in <33>	Pollen specialist
a) Impregnation of the 3 monolith samples and manufacture of 6 thin sections of c.110 x 70mm • from across contacts A1/A2 + A2/B in monolith <31> • from A1, A1/A2 and A2/B in monolith <33> • from A1/A2 in monolith <32> b) analysis / interpretation of the depositional and post-depositional characteristics recorded in these samples (*)	Likely to take 3 months to prepare the thin sections.
Comparison of the sequence and chronology of events with valley sediment profiles from other CTRL sites and from the published literature for the area.	Geoarchaeologist
* It is suggested that the thin sections / pollen slides should initially be scanned to assess their potential and, if suitable the analysis should be undertaken.	

Bibliography

Allen, MJ 1995 'The prehistoric land-use and human ecology of the Malling Caburn Downs' *Sussex Archaeological Collections 133* 19-43

Godwin, H, 1962 'Vegetational History of the Kentish chalk downs as seen at Wingham and Frogholt' *Veroff. Geobot. Inst., Zurich*

Thomas, KD, 1989 'Vegetation of the British Chalklands in the Flandrian period: a response to Bush' *Journal of Archaeological Science 16* 549-553

Preece, RC, and Bridgland, DR, 1998 *Late Quaternary Environmental Change in NW Europe: excavations at Holywell Coombe, SE England*

Waller, MP, 1998 'Wealden vegetational history: the Brede and Panel Valleys' in *The Quaternary of Kent and Sussex, QRA Field Guide* Eds. Murton *et al*

Allen, MJ 1995 'The prehistoric land-use and human ecology of the Malling Caburn Downs' *Sussex Archaeological Collections 133* 19-43

Evans, JG, 1975 *The environment of early man in the British Isles*

Godwin, H, 1962 'Vegetational History of the Kentish chalk downs as seen at Wingham and Frogholt' *Veroff. Geobot. Inst., Zurich*

Thomas, KD, 1989 'Vegetation of the British Chalklands in the Flandrian period: a response to Bush' *Journal of Archaeological Science 16* 549-553

Preece, RC, and Bridgland, DR, 1998 *Late Quaternary Environmental Change in NW Europe: excavations at Holywell Coombe, SE England*

Waller, MP, 1998 'Wealden vegetational history: the Brede and Panel Valleys' in *The Quaternary of Kent and Sussex, QRA Field Guide* Eds. Murton *et al*

Waller, MP, & Hamilton, SD, 1998 'The vegetational history of the South Downs: Mount Caburn' in *The Quaternary of Kent and Sussex, QRA Field Guide* Eds. Murton *et al*