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MAP Archaeological Practice

Land North of Thornfield Road
Nosterfield
North Yorkshire

20/02791/OUT

Archaeological Evaluation by Trial Trenching

MAP 05.45.2021

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Version	Written/Revision by:	Date:	Checked by:	Date:
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Archaeological Evaluation by Trial Trenching

Non-technical Summary

An Archaeological Evaluation by Trial Trenching was carried out by MAP Archaeological Practice Ltd., on land North of Thornfield Road, Nosterfield, North Yorkshire on the in January 2022. The evaluation was undertaken to assess the potential of archaeological remains and to allow the Principal Archaeologist at North Yorkshire County Council to make a reasoned decision regarding further mitigation that may be required prior to the development of the site. The work was undertaken on behalf of Mulgrave Properties.

A total of five trenches were excavated within the site boundary, with a single archaeological feature identified within Trench 2. A cremation containing burnt bone and charcoal was recovered from a small pit feature. Cremation burials are not uncommon in the vicinity of the site, although the Thornfield Road example did contain an above average amount of bone than is generally present in the area. Although dating of the remains has not been carried out, it is likely that it is of prehistoric date, in line with other examples found in the vicinity.

In consultation with the Principal Archaeologist at North Yorkshire County Council, it is recommended that mitigation in the form of strip, map and record be carried out in areas of inevitable disturbance, prior to any development taking place on the site.

1. Introduction

1.1 This report sets out the results of an Archaeological Evaluation by Trial Trenching that was carried out by MAP Archaeological Practice Ltd. on land north of Thornfield Road, Nosterfield, North Yorkshire (SE 27919 80561) in January 2022.

1.2 The work was undertaken in order to inform the Principal Archaeologist at North Yorkshire County Council of the archaeological potential of this site, prior to the commencement of a residential development with associated infrastructure.

1.3 Outline planning permission has been granted, by Hambleton District Council, for the erection of 5 detached dwellings on the site (20/02791/OUT). Condition 14 attached to the application states that *No development shall take commence until a geophysical survey of the site has been undertaken and a report of the findings submitted for assessment by the Local Planning Authority.*

Subject to the findings of the geophysical survey a Written Scheme of Investigation shall be submitted to and approved by the Local Planning Authority in writing.

The scheme shall include an assessment of significance and research questions; and:

- 1. The programme and methodology of site investigation and recording*
- 2. The programme for post investigation assessment*
- 3. Provision to be made for analysis of the site investigation and recording*

4. Provision to be made for publication and dissemination of the analysis and records of the site investigation

5. Provision to be made for archive deposition of the analysis and records of the site investigation

6. Nomination of a competent person or persons/organisation to undertake the works set out within the Written Scheme of Investigation.

No development shall take place other than in accordance with the Written Scheme of Investigation.

The development shall not be occupied until the site investigation and post investigation assessment has been completed in accordance with the programme set out in the Written Scheme of Investigation and the provision made for analysis, publication and dissemination of results and archive deposition has been secured.

- 1.4 The work was carried out in accordance with the recommendations of the National Planning Policy Framework (February 2021) on 'Archaeology and Planning' and according to the Written Scheme of Investigation that was prepared by MAP Archaeological Practice Ltd. (Appendix 6).
- 1.5 MAP adhered to the general principles of both the ClfA 'Code of Conduct' (2021) and 'Standard and Guidance for Archaeological Field Evaluation' (2020) throughout the project.
- 1.6 The site code for the project was MAP 05.45.2021.

1.7 All maps within this report have been produced with permission of the Controller of Her Majesty's Stationary Office (© Crown copyright. License AL50453A). With additional mapping data derived from OpenStreetMap. (<https://www.openstreetmap.org/copyright>).

1.8 All work was funded by Mulgrave Properties.

2. Site Description (SE 27919 80561)

2.1 The Proposed Development Area measures approximately 0.85Ha and lays northeast of the village of Nosterfield, approximately 10km north of Ripon (Fig. 1). The site consists of a single arable field, bounded on all sides by hedgerows.

2.2 At the time of the evaluation the site was under grass pasture and was firm underfoot (Pl. 1).

2.3 The site consists of a bedrock geology of Cadeby Formation overlain by sand and gravel (British Geological Survey, 2022). The soils of the site are described as freely draining, slightly acid loamy soils (Soilscapes, 2022).

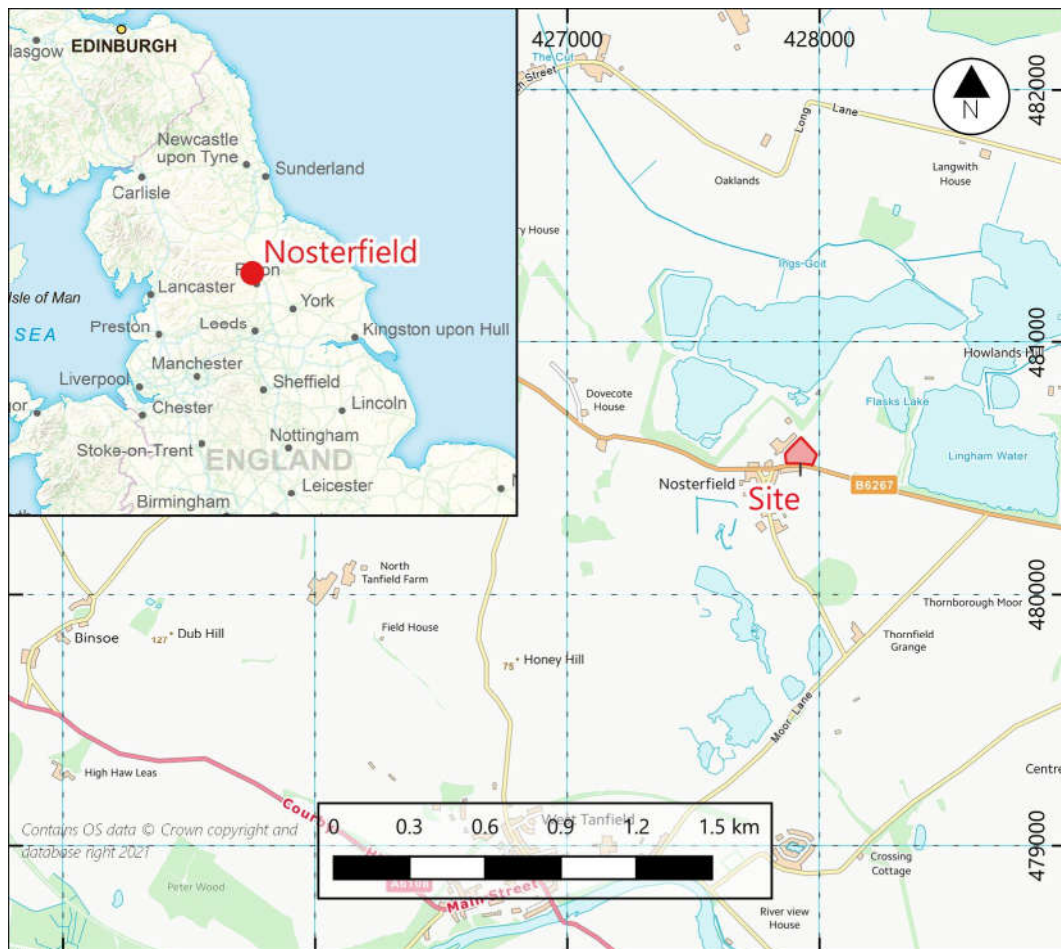


Figure 1. Site Location.

3. Archaeological and Historical Background

- 3.1 The site lies within a landscape of considerable archaeological interest which includes the Thornborough Henge Neolithic and Bronze Age complex.

- 3.2 The site lies approximately 400m north of the Thornborough Henge complex, a Scheduled Monument (List Entry Number: 1004912) which contains earth circles, a cursus, pit alignments and burial sites (Historic England 2019). The three henges, which are approximately 500m apart on a south-east to north-west alignment and are likely to be Neolithic in date,

are sited within a natural bowl which has higher land around the promontory.

- 3.3 Evidence for increased activity in the area, during the Neolithic period has been identified in the area, including at Nosterfield Quarry, to the west of the site, where excavation has revealed pit alignments and several Bronze Age burials associated with barrows and a cremation cemetery.
- 3.4 Ten barrows and two pit alignments are located around the complex which are believed to date to the early Bronze Age. Excavation of the pit alignments has suggested they held large timber posts, possibly forming a processional avenue (Pastscape 2019).
- 3.5 Cropmarks of a potential round barrow have also been identified through aerial photography, approximately 250m north of the centre of the northernmost henge (MNY 34398).
- 3.6 A Geophysical Survey was undertaken across the site in 2021 (Phase Site Investigations). No anomalies typical of archaeological features were identified. Features relating to agricultural regimes were identified across the site as were anomalies caused by modern material.

4. Aims and Objectives

- 4.1 The aim of the Archaeological Trial Trenching was to determine the presence/absence, nature, date, quality of survival and importance of archaeological deposits to enable an assessment of the potential and significance of the archaeology to be made.

5. Methodology

5.1 Excavation

5.1.1 Five trenches, all measuring 25m x 2m were located and latterly levelled using a Trimble R8s GPS rover. The trenches were positioned across the site to investigate geophysical anomalies but also areas which appear void of archaeology in the results of the survey.

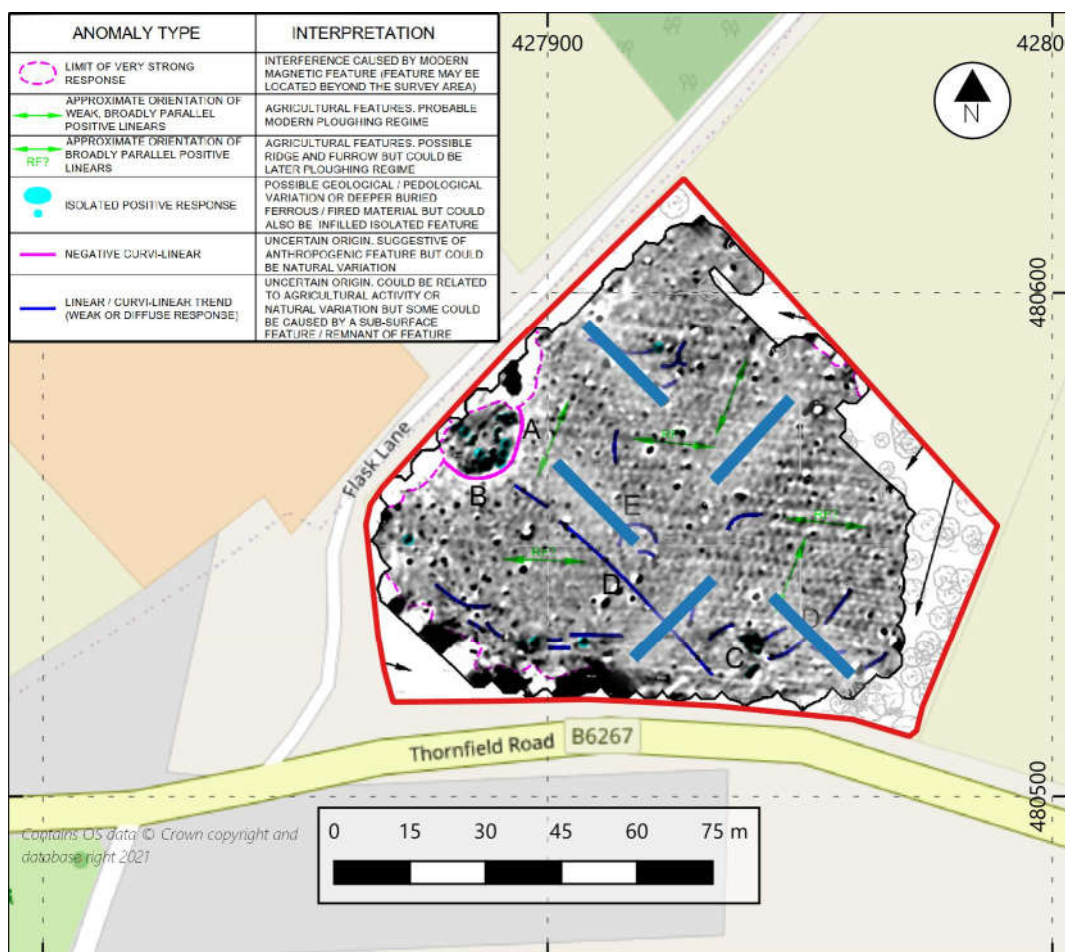


Figure 2. Trench Location Plan

5.1.2 Once positioned the trenches were excavated using a wheeled JCB 3CX excavator fitted with a 2m wide toothless bucket. In each trench topsoil was judiciously excavated down to the level of buried archaeological features or natural geology, operating under close archaeological supervision. The

exposed surfaces were cleaned appropriately, and any subsequent excavation was carried out by hand.

5.2 MAP adhered to the general principles of the ClfA Code of Conduct (ClfA 2021) throughout the project and to the ClfA “Standards and Guidance for Archaeological Field Evaluations” (ClfA 2020).

5.2 On-site Recording

5.2.1 All five trenches were recorded on MAP’s pro forma trench sheets. The photographic record comprised of thirty digital photographs taken in jpeg and RAW. The photographic record included shot number, location of shot, direction of shot and brief description (Appendix 3).

6. Results

6.1 Excavation of the five trenches (Pls. 2-4) revealed a deposit of topsoil that consisted of a dark grey-brown sandy silt. This deposit overlaid a yellow-brown sandy silt natural, containing 75% rounded cobbles, seen in all trenches. A single feature of an archaeological interest was observed in trenches 2. The total depths of excavation, depths of the topsoil and elevations of all five trial trenches are displayed in the below table along with their orientation within the site.

<i>Trench</i>	<i>Elevation</i>	<i>Depth of Excavation</i>	<i>Depth of Topsoil</i>	<i>Depth of Subsoil</i>
<i>Tr.1</i>	North-West – 44.97m AOD	0.32-	0.32m	-
	South-East – 45.24m AOD	0.42m		
<i>Tr.2</i>	North-East – 45.30m AOD	0.30-	0.26-	-
	South-West – 45.36m AOD	0.35m	0.28m	

<i>Tr.3</i>	North-West – 45.10m AOD	0.50-	0.30-	-
	South-East – 45.09m AOD	0.53m	0.33m	
<i>Tr.4</i>	North-East – 45.05m AOD	0.33-	0.32-	-
	South-West – 44.65m AOD	0.38m	0.33m	
<i>Tr.5</i>	North-West – 44.98m AOD	0.40m	0.29-	-
	South-East – 44.99m AOD		0.30m	

- 6.2 Natural deposits were observed throughout each trench. No archaeological finds, features or deposits were identified within trenches 1, 3 4 and 5.
- 6.3 Trench 2 (Pl. 3) contained a cremation pit [203] (Pls. 5-7) at the south-west end. The Pit had a bowl-shaped profile and measured 0.39m wide by 0.15m deep and consisted of a single fill (202) of mid grey, brown sandy silt. Contained within this fill, of which 100% of it was retained, was a large quantity of charcoal and burnt bone.
- 6.4 The amount of bone contained within the pit is higher than is to be expected of prehistoric cremations within the vicinity of the site (potentially do a lack of truncation) and, as most bodily regions were represented, it is likely that the burial was 'more than a token burial' (Holst. 2022). The individual was likely to be at least 18 years of age at the time of death, although it was not possible to determine their sex.
- 6.5 An environmental sample taken from the feature contained a large cache of predominantly oak charcoal with root material which is also likely to be oak, potentially waste from a funeral pyre.

7. Conclusions

- 7.1 The results of the evaluation by Trial Trenching have indicated a presence of archaeological remains to be present on the site, albeit potentially isolated. The cremation burial is not unexpected, given the prevalence of documented prehistoric activity within the vicinity of the site, although to date it is not possible to accurately determine how the cremation fit within its wider landscape.
- 7.2 In consultation with the Principal Archaeologist at North Yorkshire County Council, it is recommended that mitigation in the form of strip, map and record be carried out in areas of inevitable disturbance, prior to any development taking place on the site.

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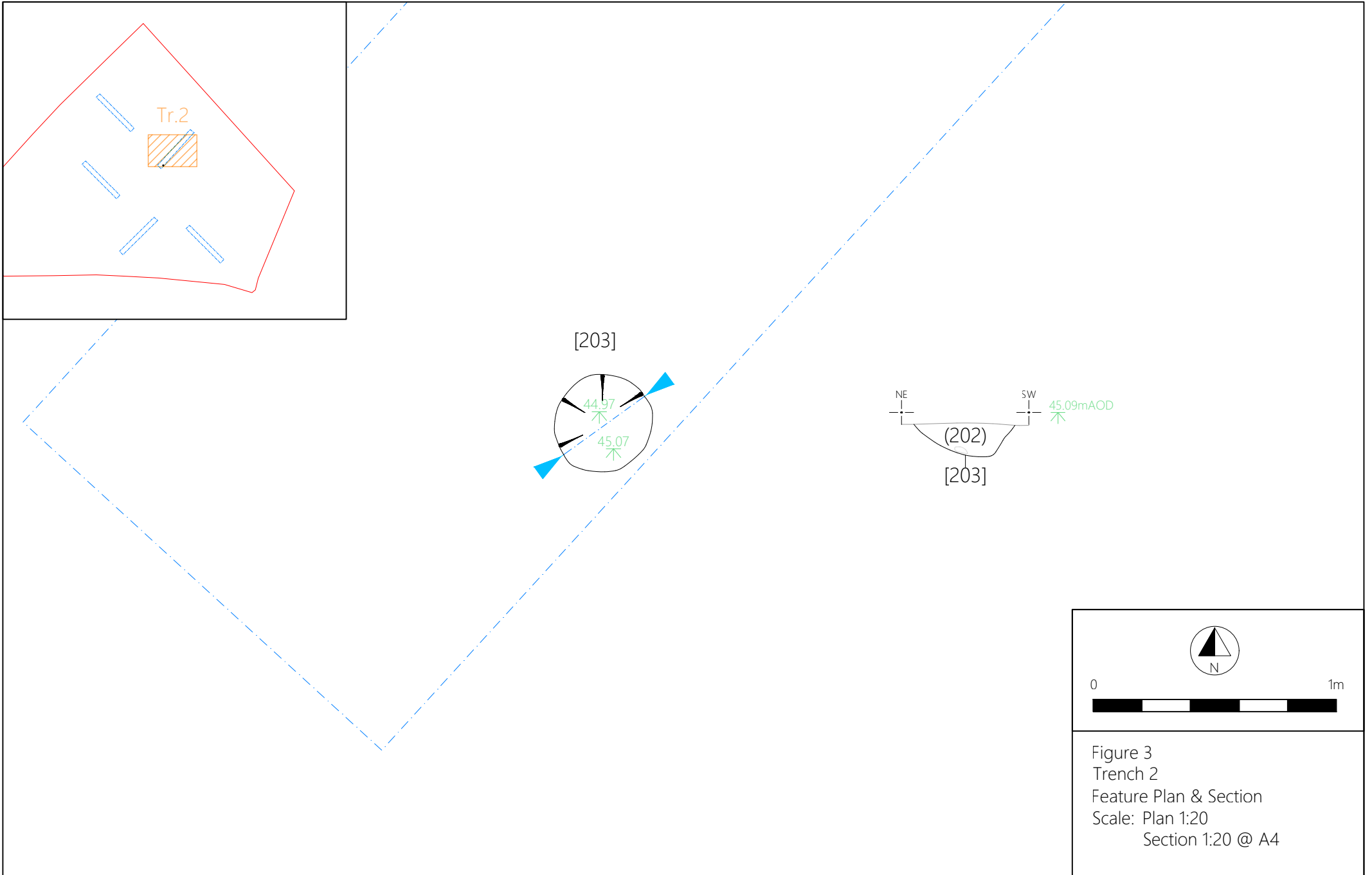


Figure 3
Trench 2
Feature Plan & Section
Scale: Plan 1:20
Section 1:20 @ A4



Plate 1: General view of site, facing West.



Plate 2: General view of Trench 1, facing South-east.



Plate 3: General view of Trench 2, facing South-west.



Plate 4: General view of Trench 4, facing South-west.



Plate 5: Pre-excitation of Cremation Pit [203], facing South-east.



Plate 6: North-west facing Section of Cremation Pit [203], facing South-east.



Plate 7: Full excavation of Cremation Pit [203], facing South-east.

APPENDIX 1

Context Listing

Context	Context Type	Fill of	Description
101	Deposit	-	Topsoil: dark grey brown, sandy silt.
201	Deposit	-	Topsoil: dark grey brown, sandy silt.
202	Fill	[203]	Mid grey brown, sandy silt. Single fill of cremation pit [203].
203	Cut	-	Cut of cremation pit.
301	Deposit	-	Topsoil: dark grey brown, sandy silt.
401	Deposit	-	Topsoil: dark grey brown, sandy silt.
501	Deposit	-	Topsoil: dark grey brown, sandy silt.

APPENDIX 2

Drawn Archive Listing

Drawing	Scale	Context	Description
1	1:10	(202)-[203]	North west Facing Section of Cremation Pit [203]
2	1:20	(202)-[203]	Plan of Cremation Pit [203] - Half Section
3	1:20	(202)-[203]	Plan of Cremation Pit [203] - Full Excavation

APPENDIX 3

Photographic Archive Listing

Frame	Context	Scale	Facing	Description
0048	-	-	North-east	General Site Shot
0049	-	-	East	General Site Shot
0050	-	-	North	General Site Shot
0051	-	-	West	General Site Shot
0052	-	1m	North-west	General Shot of Trench 1
0053	-	1m	South-east	General Shot of Trench 1
0054	-	1m	South-east	General Shot of Trench 1
0055	-	1m	North-east	General Shot of Trench 2
0056	-	1m	South-west	General Shot of Trench 2
0057	-	1m	South-east	General Shot of Trench 5
0058	-	1m	South-east	General Shot of Trench 5
0059	-	1m	South-east	General Shot of Trench 5
0060	-	1m	North-west	General Shot of Trench 5
0061	-	1m	South-west	General Shot of Trench 4
0062	-	1m	South-west	General Shot of Trench 4
0063	-	1m	North-east	General Shot of Trench 4
0064	-	1m	North-west	General Shot of Trench 3
0065	-	1m	South-east	General Shot of Trench 3
0066	(202)-[203]	1m	North-west	Pre-excavation of Cremation Pit [203]
0067	(202)-[203]	1m	North-west	Pre-excavation of Cremation Pit [203]
0068	(202)-[203]	1m	South-east	Pre-excavation of Cremation Pit [203]
0069	(202)-[203]	1m	South-east	Pre-excavation of Cremation Pit [203]
0070	(202)-[203]	1m	South-east	North-west Facing Section of Cremation Pit [203]
0071	(202)-[203]	1m	South-east	North-west Facing Section of Cremation Pit [203]
0072	(202)-[203]	1m	South-east	North-west Facing Section of Cremation Pit [203]
0073	(202)-[203]	1m	South-east	North-west Facing Section of Cremation Pit [203]
0074	(202)-[203]	-	South-east	North-west Facing Section of Cremation Pit [203]
0075	(202)-[203]	1m	South-east	Full Excavation of Cremation Pit [203]
0076	(202)-[203]	1m	South-east	Full Excavation of Cremation Pit [203]
0077	(202)-[203]	1m	South-east	Full Excavation of Cremation Pit [203]



LICENCE FOR THE REMOVAL OF HUMAN REMAINS

The Secretary of State, in exercise of the power vested in him by section 25 of the Burial Act 1857 (20 & 21 Vic., cap.81), grants a licence for the removal of the remains of **persons unknown** from or within the place in which they are now interred at **Land North of Thornfield Road, Nosterfield, North Yorkshire.**

2. It is a condition of this licence that the following precautions shall be observed:
 - (a) Any removal or disturbance of the remains shall be effected with due care and attention to decency;
 - (b) The ground in which the remains are interred shall be screened from the public gaze while the work is in progress;
 - (c) The remains shall, no later than 6 February 2027 be reinterred within a burial ground in which interments may legally take place. In the meantime shall be kept safely, privately and decently by MAP Archaeological Practice Ltd under the control of a competent member of staff.
3. This licence merely exempts those from the penalties, which would be incurred if the removal took place without a licence. It does not in any way alter civil rights. It does not confer the right to bury the remains in any place where such right does not already exist.
4. This licence expires on **6 February 2027.**

A handwritten signature in black ink, appearing to read 'L. Finch'.

Linda Finch
on behalf of the Secretary of State for Justice



Ministry of Justice

Licence Number: **22-0022**

Date: **7 February 2022**

Osteological Analysis
Land North of Thornfield Road
Nosterfield
North Yorkshire

Site Code: 05.45.21
NGR: SE 27919 80561

Report No 0322
March 2022

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Acknowledgements

York Osteoarchaeology Ltd would like to thank Kelly Hunter and Jen Jackson of MAP Archaeological Practice Ltd for their help and support.

INTRODUCTION

In February 2022, York Osteoarchaeology Ltd was commissioned by MAP Archaeological Practice Ltd to carry out the osteological analysis of one cremated bone assemblage recovered from during an archaeological evaluation by trial trenching at Land North of Thornfield Road, Nosterfield, North Yorkshire in January 2021 (NGR SE 27919 80561) prior to the development of the site.

The site was located to the west of the A1(M), just north of Thornfield Road (B6267) in Nosterfield. The site is located c.600m south-west of Nosterfield Quarry, where deposits of calcined bone, a small cremation cemetery and several inhumations have been previously recovered during archaeological watching briefs by Field Archaeology Specialists (Holst 2003; 2004; 2005).

The human skeletal remains reported on here were recovered from the south-western end of Trench 2, on the north-eastern side of the excavated area. The deposit containing the cremated bone (202) was interred in a shallow circular, bowl-shaped pit [203], with no evidence of a vessel or other associated artefacts (Table 1).

Table 1 Summary of cremated assemblages

Context	Feature	Location	Urn ?	Bone Colour	Preservation	Artefacts and Inclusions	MNI	Age	Sex	Weight (g)	Weight as % of modern *	Provisional Date
(202)	[203]	Trench 2	No	Yellow-grey	Moderate to Good	None recorded	1	At least 11+ yr	-	584.9g	36.0%	Unknown, presumed prehistoric

Key: Age: A – adult, N– neonate, C- child, -- unknown; Sex: M – male, F – female, -- unknown; MNI – minimum number of individuals

* Weight of bone >2mm expressed as a percentage of the average weight of bone >2mm recovered from modern cremation burials (1625.9g, McKinley 1993)

Aims and Objectives

The macroscopic skeletal assessment aimed to determine age and sex, as well as any manifestations of disease from which the individuals may have suffered. Additionally, information was sought regarding the cremation techniques.

Methodology

The cremated bone was sieved through a stack of sieves, with 10mm, 5mm and 2mm mesh sizes. The bone recovered from each sieve was weighed and sorted into identifiable and non-identifiable bone. The identifiable bone was divided into five categories: skull, axial (excluding the skull), upper limb, lower limb and long bone (unidentifiable as to the limb). All identifiable groups of bone were weighed and described in detail. The cremated remains were weighed separately to the nearest 0.1g and percentages calculated.

OSTEOLOGICAL ANALYSIS

Osteological analysis is concerned with the determination of the demographic profile of the assemblage based on the assessment of sex, age and non-metric traits. This information is essential in order to determine the prevalence of disease types and age-related changes. It is also crucial for identifying gender dimorphism in occupation, lifestyle and diet, as well as the role of different age groups in society.

Preservation

Skeletal preservation depends upon a number of factors, including the age and sex of the individual as well as the size, shape and robusticity of the bone. Burial environment, post-depositional disturbance and treatment following excavation can also have a considerable impact on bone condition. Preservation of human remains is assessed subjectively, depending on the severity of bone surface erosion and post-mortem breaks, but disregarding completeness.

Preservation was assessed using a grading system of five categories: very poor, poor, moderate, good and excellent. Excellent preservation implied no bone erosion and very few or no post-depositional breaks, whereas very poor preservation indicated complete or almost complete loss of the bone surface due to erosion and severe fragmentation.

The bone preservation was moderate to good, with little surface erosion. Some warping was present, particularly in bones with a thinner cortex. Linear and U-shaped cracking was evident, particularly on long bone shaft fragments. The fragment size of cremated bone is frequently attributed to post-cremation processes. This is because skeletal elements retrieved from modern crematoria tend to be comparatively large before being ground down for scattering or deposition in the urn. Bone is also prone to fragmentation if it is moved while still hot (McKinley 1994, 340). The majority of bone recovered was between 5-10mm in size (55.0 %; Table 2).

Table 2 Summary of cremated bone fragment size

Context	Feature	Sieve Fractions						Total >2mm	<2mm	Total	Total as % of modern
		10mm		5mm		2mm					
		g	%	g	%	g	%	g	g	g	%
(202)	[203]	150.0	25.6	321.5	55.0	96.2	16.4	567.7	17.2	584.9	36.0

The colour of cremated bone can help to inform us about the nature of the pyre conditions. The cremated bone was uniformly white-grey in colour, indicating that it was well burnt, causing the loss of a majority, but not all, of the organic portion of the bone (see Table 1). White bone is produced by temperatures in excess of 600°C with sufficient oxygen. According to McKinley (1989), the body requires a minimum temperature of 500°C over seven to eight hours to achieve complete calcination of the bone. Lower temperatures result in shades of brown, grey and blue depending on the exposure of that part of the body and oxygen supply, indicating in this case that the bone was probably burnt at a lower temperature.

The total weight of burnt bone was 584.9g (see Table 2). The average bone weight produced by modern crematoria tends to range from 1,000.5g to 2,422.5g with a mean of 1,625.9g (McKinley 1993). As such, approximately 36.0% of the weight of a modern cremation was recovered here, suggesting that this deposit represents the burial of a reasonable portion of the cremated bone, rather than a small, token deposit. It is possible that the feature has also been truncated at some point, resulting in the post-depositional loss of bone.

Deposit 202 contained a variety of identifiable bone, representing most of the major bodily regions. Identified fragments consisted of skull (including tooth root fragments), axial, upper and lower limb bones and unidentified long bone. Metatarsal, metacarpal and phalanx fragments were also present. The proportion of identifiable bone was 44.5% (Table 3). Skull fragments made up the greatest proportion of the identified bone by weight (14.0%; Table 3), however, the morphology of skull fragments is distinctive from other bony elements and therefore does make them more readily identifiable in cremation deposits.

Table 3 Summary of identifiable elements in the cremation burials

Context	Feature	Identified Bone										Total ID	Total ID
		Skull		Axial		Upper Limb		Lower Limb		Long bones			
		g	%	g	%	g	%	g	%	g	%	g	%
(202)	[203]	81.7	14.0	32.9	5.6	22.1	3.8	42.1	7.2	81.3	13.9	260.1	44.5

Minimum Number of Individuals

A count of the 'minimum number of individuals' (MNI) recovered from a cemetery is carried out as standard procedure during osteological assessments of inhumations in order to establish how many individuals were represented by the articulated and disarticulated human bones (without taking the archaeologically defined graves into account). The MNI is calculated by counting all long bone ends, as well as other larger skeletal elements, such as the hip joints and cranial elements.

The minimum number of individuals in cremated bone assemblages is difficult to assess with 100% accuracy because usually, only a token selection of bone from the pyre tends to be buried. Double burials can be identified only if skeletal elements are duplicated, or if skeletons of different ages are represented in one burial.

No obvious repeated elements or indications of a double burial were identified in Burial 202, giving a tentative MNI of one individual.

Assessment Of Age

Age was determined using standard ageing techniques, as specified in Scheuer and Black (2000a; 2000b) and Cox (2000). Age estimation relies on the presence of the pelvis and uses different stages of bone development and degeneration in order to calculate the age of an individual. Age is split into a number of categories, from foetus (up to 40 weeks in *utero*), neonate (around the time of birth), infant (newborn to one year), juvenile (1-12 years), adolescent (13-17 years), young adult (ya; 18-25 years), young middle

adult (yma; 26-35 years), old middle adult (oma; 36-45 years), mature adult (ma; 46+) to adult (an individual whose age could not be determined more accurately as over the age of seventeen).

As none of the criteria normally used for age determination were represented in the deposit, age determination was based on less reliable criteria. A distal metatarsal head was present in the >10mm fraction and was well fused, indicating a minimum age of eleven to sixteen years (Scheuer and Black, 2000b). No unfused epiphyses were observed, which, when considered with the general robusticity, size and morphology of the bone fragments, generally appears to indicate an older adolescent or adult (c.16-18+ yr).

Sex Determination

Sex determination is usually carried out using standard osteological techniques, such as those described by Mays and Cox (2000). Assessment of sex in both males and females relies on the preservation of the skull and the pelvis and can only be carried out once sexual characteristics have developed, during late puberty and early adulthood.

None of the criteria used for sex determination were represented in Burial 202 and therefore a sex estimation was not possible.

Metric Analysis and Non-Metric Traits

Cremated bone shrinks at an inconsistent rate (up to 15%) during the cremation process and it was therefore not possible to measure any of the bones from these burials.

Non-metric traits are additional sutures, facets, bony processes, canals and foramina, which occur in a minority of skeletons and are believed to suggest hereditary affiliation between skeletons (Saunders 1989). The origins of non-metric traits have been extensively discussed in the osteological literature and it is now thought that while most non-metric traits have genetic origins, some can be produced by factors such as mechanical stress (Kennedy 1989) or environment (Trinkhaus 1978). Non-metric traits were not observed.

PATHOLOGICAL AND DENTAL ANALYSIS

The analysis of skeletal and dental manifestations of disease can provide a vital insight into the health and diet of past populations, as well as their living conditions and occupations.

No pathology was observed on the bone in Burial 202.

FUNERARY RITUAL

No evidence of a vessel or other artefacts was present in association with Burial 202 and no scientific dating methods have been applied to date. A number of human remains from Nosterfield Quarry have

previously been excavated and reported on. These include three assemblages of calcined bone excavated in 1997 (Holst 2003), four assemblages of calcined bone excavated in 1999 (*ibid*), a small cremation cemetery and two unusual, curated inhumations interred near a large ring ditch, excavated in 2002 (*ibid*). Additionally, one inhumation was found in 2003 buried in a supine, semi-flexed position in an oval pit (NOS03; Holst 2004) and two supine extended inhumations associated with two curvilinear ditches, were excavated in 2005 (NOS04; Holst 2005). Unfortunately, many of the previously excavated human remains from Nosterfield are also undated. The semi-flexed inhumation excavated in 2003 has been tentatively assigned an Iron Age date (Holst 2004) and the cremation cemetery excavated in 2002 is likely to be Middle Bronze Age, based on the urns and pottery evidence present (Holst 2003). Therefore, while the date of burial (202) is unknown, it is probably prehistoric, based on the site context.

While there is clearly a legacy of cremation burial in the Nosterfield area, there appears to be diversity in the deposits recorded. The cremation burials excavated in 2002 from Nosterfield Quarry varied in their context and associated artefacts: ten of the human cremation burials were associated with a small ring ditch, while a further cremation burial was found in association with a larger ring ditch (Holst 2003). Four (possibly up to six) of these burials were interred in urns; the burial associated with the larger ring ditch may have been buried in a square container and there may have been a double burial present (Holst 2003). Burial 202 differs so far that it is not reported to be associated with any artefacts or features, such as a ring ditch. The previously excavated cremation burials also vary considerably in weight, from 0.7g to 1301.7g, with a mean of 175.6g (Holst 2003). This places the quantity of bone recovered from deposit 202 (584.9g) well above the mean for the area, though the lower weight of some of these may have been due to deep ploughing. Furthermore, in contrast to the bone analysed from Burial 202, the previously excavated cremation burials from Nosterfield have been reported as being very well burnt, with the majority of bone being white. Only one deposit was reported as having some brown colouration which could be associated with burning at a lower temperature (F99; Holst 2003). This indicates that the bone in Burial 202 may not have burnt using the same methods as the majority of those previously excavated. Overall, this indicates a variety of processing, collection and possibly also deposition strategies were present in Nosterfield and that Burial 202 does differ in some respects from the previously analysed cremation burials.

CONCLUSION

The human bone present in Burial 202 represented approximately 36% of the expected quality of bone found in modern cremations and thus does not represent an entire skeleton. However, the amount of bone recovered is above average for the area - perhaps due to less truncation rather than different funerary practices - and most bodily regions were represented, indicating this was more than a token burial.

The bone was moderately well burnt, with the loss of the majority of its organic portion. Based on the identifiable bone fragments, the bone is likely to represent a minimum of one individual. The presence of a fused distal metatarsal head indicates that the individual was at least eleven to sixteen years old at the time of death and the general robusticity of the bone indicates they were likely to be an adult (18+ years).

Unfortunately, based on the bone present, it was not possible to determine the sex of the individual, and no pathology was observed.

Other cremation burials are present in the nearby area, but the lack of scientific dating and differences in funerary practices mean it is not clear how Burial 202 fits into the local funerary landscape. It is recommended, if possible, that scientific dating is undertaken in order to help improve the understanding of this burial and its wider context.

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Nosterfield MAP 05-45-21

Carbonised Plant Macrofossils and Charcoal

Diane Alldritt

1: Introduction

A single environmental sample flot taken during archaeological investigations on land at Nosterfield (MAP 05-45-21) was examined for carbonised plant macrofossils and charcoal. The sample was taken from a cremation deposit and produced a large concentration of charcoal likely to be fuel waste from the pyre.

2: Methodology

The bulk environmental sample was processed by MAP Archaeological Practice Ltd. using a Siraf style water flotation system (French 1971). The sample was 20litres in volume. The flot was dried before examination under a low power binocular microscope typically at x10 magnification. All identified plant remains including charcoal were removed and bagged separately by type.

Wood charcoal was examined using a high powered Vickers M10 metallurgical microscope at magnifications up to x200. The reference photographs of Schweingruber (1990) were consulted for charcoal identification. Plant nomenclature utilised in the text follows Stace (1997) for all vascular plants apart from cereals, which follow Zohary and Hopf (2000).

3: Results

The sample produced a concentrated deposit of carbonised remains 250ml in volume consisting of charcoal fragments 0.5cm to 2.0cm in size in amongst crushed charred detritus and ashy waste. Modern remains were recorded at <2.5ml in volume mainly root detritus indicating a low degree of bioturbation was taking place and suggesting the deposit was likely to be fairly secure.

Results are given in table 1 and discussed below.

4: Discussion

Cremation

Deposit (202) contained a large cache of charcoal mostly identified as *Quercus* (oak) together with some finds of indeterminate root material, possibly also oak, likely to be fuel waste from a cremation pyre. No other carbonised remains such as cereal grain, hazel nutshell or weeds were present.

5: Conclusion

The environmental sample from cremation deposit (202) produced a large quantity of oak charcoal which was probably fuel waste from cremation processes. The oak could potentially be radiocarbon dated but the longevity of oak wood could produce skewed dating results and it may be more advisable to date the bone finds, or submit both for comparison.

Further excavation work at the site may continue to produce sporadic finds of carbonised remains.

References

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Stace, C. 1997 *New Flora of the British Isles*. 2nd Edition Cambridge University Press.

Zohary, D. and Hopf, M. 2000 *Domestication of Plants in the Old World*. 3rd Edition Oxford University Press.

Nosterfield	Context	202
MAP 05-45-21	Sample	1
	Feature	cremation deposit
	Sample Volume (litres)	20
	Total CV	250ml
	Modern	<2.5ml
Charcoal	Common Name	
<i>Quercus</i>	oak	15 (6.14g)
Indeterminate		5 (3.40g)



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MAP Archaeological Practice

Land North of Thornfield Road
Nosterfield
North Yorkshire

20/02791/OUT

Archaeological Evaluation by Trial Trenching

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WRITTEN SCHEME OF INVESTIGATION:
Archaeological Trial Trenching

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Land North of Thornfield Road
Nosterfield
North Yorkshire
20/02791/OUT

Written Scheme of Investigation
Archaeological Trial Trenching

1 Summary

1.1 This document sets out the details for the archaeological work required on land north Thornfield Road, Nosterfield, North Yorkshire (SE 27919 80561) in order to inform the Principal Archaeologist at North Yorkshire County Council of the archaeological potential of the site, prior to the commencement of a residential development with associated infrastructure. The Written Scheme of Works has been commissioned by Mulgrave Properties.

1.2 In accordance with the recommendations of the National Planning Policy Framework (20121) on 'Archaeology and Planning' a staged scheme of archaeological work is proposed. The results of the Trial Trenching, which follows a Geophysical, will be summarised in a report and an appropriate mitigation strategy will be formulated if necessary.

2 Site Description and Planning Background

2.1 The Proposed Development Area measures approximately 0.85Ha and lays to the north-east of the village of Nosterfield, approximately 10km north of Ripon.

2.2 The site consists of a single arable field bounded on all sides by hedgerows. Bedrock geology of the Cadeby Formation is overlain by sand and gravel (BGS. 2021).

2.3 Outline planning permission has been granted, by Hambleton District Council, for the erection of 5 detached dwellings on the site (20/02791/OUT). Condition 14 attached to the application states that *No development shall take commence until a geophysical survey of the site has been undertaken and a report of the findings submitted for assessment by the Local Planning Authority.*

Subject to the findings of the geophysical survey a Written Scheme of Investigation shall be submitted to and approved by the Local Planning Authority in writing.

The scheme shall include an assessment of significance and research questions; and:

- 1. The programme and methodology of site investigation and recording*
- 2. The programme for post investigation assessment*
- 3. Provision to be made for analysis of the site investigation and recording*
- 4. Provision to be made for publication and dissemination of the analysis and records of the site investigation*
- 5. Provision to be made for archive deposition of the analysis and records of the site investigation*
- 6. Nomination of a competent person or persons/organisation to undertake the works set out within the Written Scheme of Investigation.*

No development shall take place other than in accordance with the Written Scheme of Investigation.

The development shall not be occupied until the site investigation and post investigation assessment has been completed in accordance with the programme set out in the Written Scheme of Investigation and the provision made for analysis, publication and dissemination of results and archive deposition has been secured.

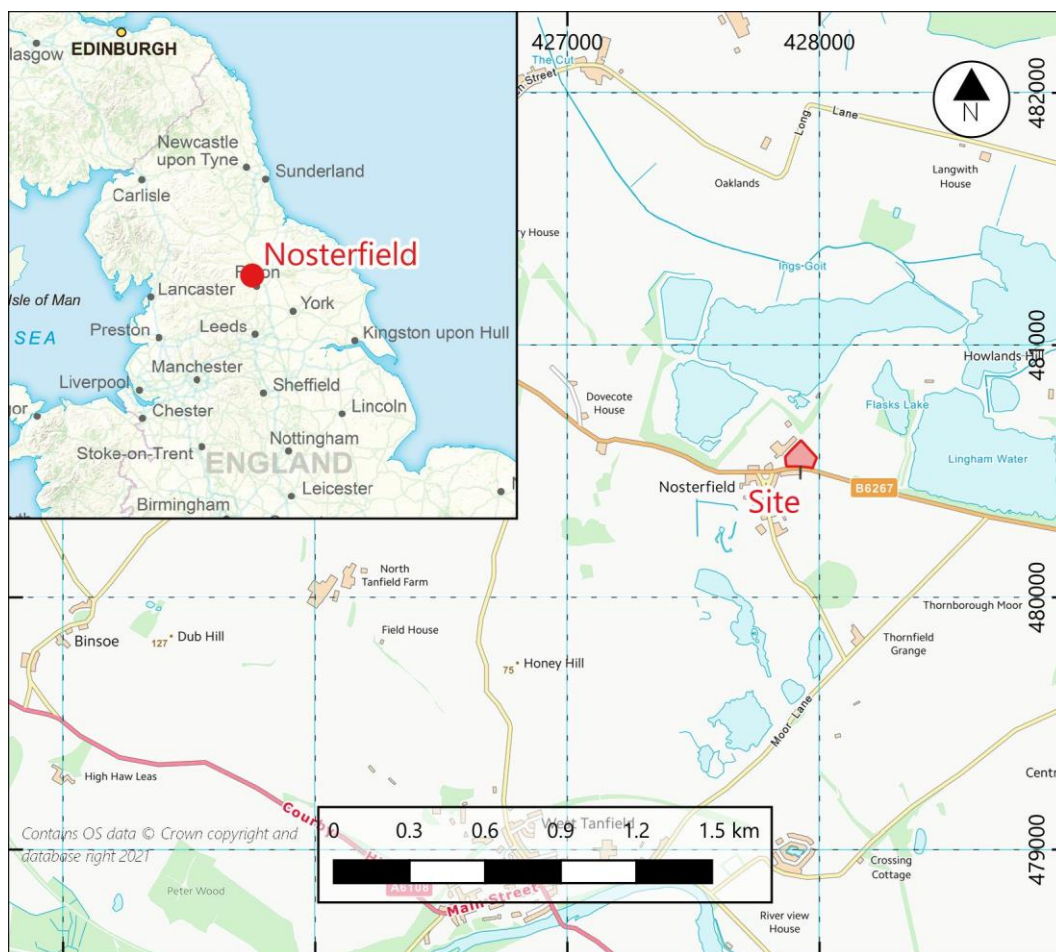


Figure 1. Site Location.

3. Archaeological and Historical Background

- 3.1 The site lies within a landscape of considerable archaeological interest which includes the Thornborough Henge Neolithic and Bronze Age complex.
- 3.2 The site lies approximately 400m north of the Thornborough Henge complex, a Scheduled Monument (List Entry Number: 1004912) which contains earth circles, a cursus, pit alignments and burial sites (Historic England 2019). The three henges, which are approximately 500m apart on a south-east to north-west alignment and are likely to be Neolithic in date, are sited within a natural bowl which has higher land around the promontory.
- 3.3 Evidence for increased activity in the area, during the Neolithic period has been identified in the area, including a Nosterfield Quarry where excavation has revealed pit alignments and several Bronze Age burials associated with barrows and a cremation cemetery.
- 3.4 Ten barrows and two pit alignments are located around the complex which are believed to date to the early Bronze Age. Excavation of the pit alignments has suggested they held large timber posts, possibly forming a processional avenue (Pastscape 2019).
- 3.5 Cropmarks of a potential round barrow have also been identified through aerial photography, approximately 250m north of the centre of the northernmost henge (MNY 34398).

3.6 A Geophysical Survey was undertaken across the site in 2021 (Phase Site Investigations). No anomalies typical of archaeological features were identified. Features relating to agricultural regimes were identified across the site as were anomalies caused by modern material.

4. Aims and Objectives

4.1 The aim of the Archaeological Trial Trenching is to determine the presence/absence, nature, date, quality of survival and importance of archaeological deposits to enable an assessment of the potential and significance of the archaeology to be made.

5 Compliance

5.1 MAP will adhere to the general principles of the ClfA Code of Conduct (ClfA 2019) throughout the project and to the ClfA 'Standards and Guidance for Archaeological Field Evaluations' (CIFA 2020).

5.2 All work will be carried out in accordance with chapter 16 of the National Planning Policy Framework (2020) on 'Archaeology and Planning'.

5.3 The work will be monitored under the auspices of the Principal Archaeologist at North Yorkshire County Council who should be consulted before the commencement of site works.

5.4 All maps within this report have been produced from the Ordnance Survey with the permission of the Controller of Her Majesty's Stationery Office,

Crown Copyright. License No. AL 50453A and also data derived from Open Street Map (<https://www.openstreetmap.org/copyright>).

- 5.5 If human remains are encountered during the course of this evaluation it is considered best practice to not remove the remains at this stage, however, this should be considered at a site-specific level. If it is deemed necessary to remove human remains, this will be carried out under the conditions of licences for the removal of human remains (issued by the Ministry of Justice) and in accordance with the Burial Act (1857) and 'Guidelines to the Standards for Recording Human Remains' (Brickley & McKinley. 2004) to ensure that they are treated with due dignity.
- 5.6 MAP Archaeological Practice is an ISO 9001 accredited organisation (certificate number GB2005425). The award of the ISO 9001 certificate, independently audited by the British Standards Institution (BSI), demonstrates MAP's commitment to providing a quality service to our clients. ISO (the International Organisation for Standardisation) is the most recognised standards body in the world, helping to drive excellence and continuous improvement within businesses.

6 Fieldwork Methodology

6.1 Excavation and Recording

- 6.1.1 Five trenches are proposed, positioned across the site to investigate geophysical anomalies but also areas which appear void of archaeology in the results of the survey (Fig. 2). All measure 25m x 2m.

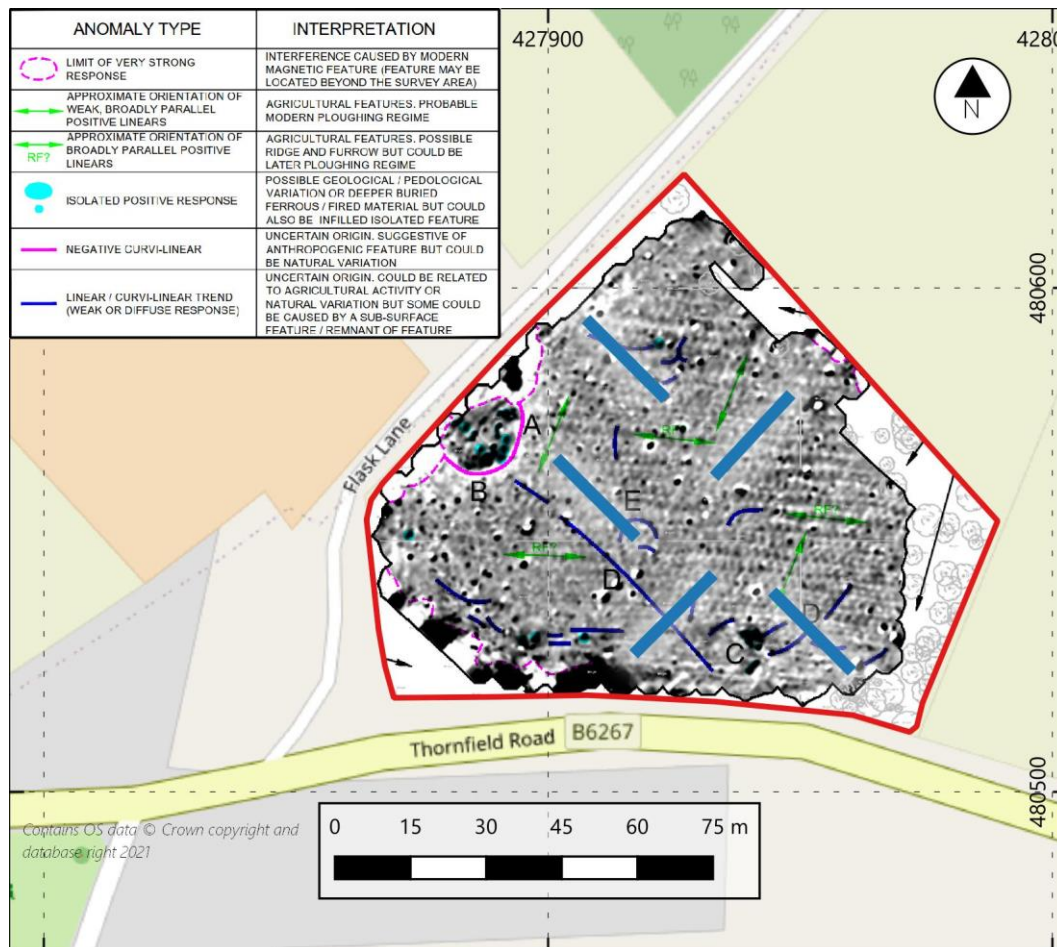


Figure 2. Trench Location Plan

61.2 All overburden, topsoil and any subsequent subsoils will be carefully removed by mechanical excavator using a wide toothless blade, under archaeological supervision, to the top of archaeological features or layers. Excavated topsoil will be redeposited in bunds around the edge of the site, or at an alternative location, to be determined in agreement with the client. Topsoil and subsoils will be stored separately, and all spoil will be stored and managed in line with the standards of the Construction Code of Practice for Sustainable Use of Soils on Construction Sites (DEFRA 2009).

6.1.3 All excavation of archaeological features and deposits carried out will be by hand. Areas of intensive modern disturbance will be given a low priority

in excavation. Where practicable, the fills of these features will be removed by mechanical excavator.

6.1.4 Context recording methodologies and systems will be used. All archaeological deposits will be recorded according to principles of stratigraphic excavation on MAP's *pro forma* sheets, which are compatible with the MoLAS recording system. The MoLAS recording manual will be used on site where necessary. The stratigraphy of trenches will be recorded even if no archaeology is found.

6.1.5 The excavation sampling policy is :

- a. A 100% sample of stakeholes
- b. An initial 50% sample should be taken of all postholes, but where they are part of a building these should be 100% excavated
- c. A 50% sample of pits with a diameter up to 1.5m (where justified, these should be 100% excavated,
- d. A minimum 25% sample of all pits over 1.5m in diameter, but this should include a complete section across the pit to record a full profile (where justified, these should be 100% excavated)
- e. linear features will be sampled a minimum of 20% along their length (each sample section to be not less than 1m), or a minimum of a 1m sample section, if the feature is less than 5m long.
- f. All junctions/intersections and corners of linear features will be investigated and their stratigraphic relationships determined – if necessary, using box sections and all ditch terminals will be examined,
- g. Funerary contexts, buildings and industrial features will be subject to sufficient excavation to establish the objectives of the evaluation but no archaeological deposit will be entirely removed unless this is unavoidable to meet the aims of the fieldwork.

- 6.1.6 In certain cases, the use of mechanical excavation equipment may also be appropriate for removing deep intrusions (e.g modern brick and concrete floors or footings), or for putting sections through major features after partial excavation (e.g ditches), or through deposits to check that they are of natural origin
- 6.1.7 A full written, drawn and photographic record will be made of all material revealed during the course of the Trial Trenching. Plans and section drawings will be drawn to a scale appropriate to the excavated feature. High resolution digital photographs should form the basis of the photographic archive.
- 6.1.8 A sampling strategy for the recovery for environmental remains has been formulated in accordance with an Environmental Strategy written by an Environmental Consultant (Diane Aldritt, appendix 1) and also follows the guidance of the Association for Environmental Archaeology (1995) and Historic England (2011).
- 6.1.9 Samples will be collected from primary and secondary contexts, where applicable, from a range of representative features, including pit and ditch fills, postholes, floor deposits, ring gullies and other negative features. Where features allow between 40 and 60 litres will be taken although entire contexts will be sampled if the volume is low, and specialist samples, such as for General Biological Analysis (GBA) or column samples, will be of the order of 20 litres. Positive features will also be sampled; retention of structural material such as bricks will be implemented where necessary. Sampling will also be considered for those features where dating by other methods (for example pottery and artefacts) is uncertain. Animal bones will

be hand collected, and bulk samples collected from contexts containing a high density of bones. Spot finds of other material will be recovered where applicable. Flotation samples and samples taken for coarse-mesh sieving from dry deposits will be processed at the time of the fieldwork wherever possible, partly to permit variation of sampling strategies if necessary, but also because processing at a later stage could cause delays.

6.1.10 If human remains are encountered during the course of this evaluation and it is deemed necessary to remove the remains, this will take place under the conditions of licences for the removal of human remains (issued by the Ministry of Justice, to ensure that they are treated with due dignity). The preferred option would be for them to be adequately recorded before lifting, and then carefully removed for scientific study, and long-term storage with an appropriate museum; however, the burial licence may specify reburial or cremation as a requirement.

6.1.11 A finds recovery and conservation strategy will be discussed with the Archaeology Manager and recipient museum in advance of the project commencing, and a policy for finds recording should be agreed and submitted to the Archaeology Manager, before commencement of site works. Any recording, marking and storage, materials will be of archive quality, and recording forms and manuals will be submitted to the Archaeology Manager, prior to the commencement of on-site works, if these have not been supplied previously. Allowance will be made for preliminary conservation and stabilisation of all objects and an assessment of long-term conservation and storage needs. We have made an allowance for a minimum four boxes in calculating estimates for museums storage grant.

- 6.1.12 All finds (artefacts and ecofacts) visible during excavation will be collected and processed, unless variations in this principle are agreed with the Local Authority. Finds will be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication First Aid for Finds. In accordance with the procedures outlined in MoRPHE, all iron objects, a selection of non-ferrous artefacts (including all coins), and a sample of any industrial debris relating to metallurgy will be X-radiographed before assessment.
- 6.1.13 We will make provision within our excavation strategies, where necessary, for use of shoring, pumps or artificial lighting. Such strategies will also follow for sampling for radiocarbon, archaeomagnetic and/or dendrochronological determinations, as appropriate: where in situ timbers are found to survive in good condition, samples should be taken for dendrochronological assay.
- 6.1.14 Arrangements for site access and reinstatement are to be agreed with the commissioning body.
- 6.1.15 Health and safety will take priority over archaeological matters. All archaeologists undertaking fieldwork must comply with all Health and Safety Legislation, this includes the preparation of a Risk Assessment.
- 6.1.16 All archaeological staff and visitors to the site will comply with current government guidance regarding COVID-19. All precautions, including those concerning social distancing will be outlined in MAP's risk and method statement. A remote site visit by the Principal Archaeologist may be required.

- 6.1.17 Necessary precautions should be taken over underground services and overhead lines.
- 6.1.18 All on site staff hold valid CSCS cards. All Project Officers and Project Managers hold a valid First Aid at Work Certificate and Site Supervisor Safety Training qualifications.
- 6.1.19 MAP will provide evidence of all necessary insurances, including Employer's Liability, Professional Liability and Public Liability Cover.

7. Post Excavation Analysis and reporting

- 7.1 Upon completion of the evaluation, the artefacts, soil samples and stratigraphic information will be assessed as to their potential and significance for further analysis.
- 7.2 A report will be prepared to include the following:
- a) A non-technical summary of the results of the work, Introduction and aims and objectives.
 - b) An introduction which should include
 - the site code/project number
 - planning reference number and HER Casework number
 - dates when fieldwork took place
 - grid reference
 - c) An account of the methods and results of the evaluation, describing structural data and associated finds and/or environmental data recovered.
 - d) Interpretation, including phasing of the site sequence and spot-dating of ceramics (Descriptive material should be clearly separated from interpretive

statements). This shall be supported by the use of photographs and drawings, to include an overall plan of the site accurately identifying the location of trenches; individual trench plans as excavated indicating the location of archaeological features, with at least one section detailing the stratigraphic sequence of deposits within each trench.

- e) A specialist assessment of the artefacts recovered with a view to their potential for further study. Allowance should be made for preliminary conservation and stabilisation of all objects and an assessment of long-term conservation and storage needs.

Assessment of artefacts must include inspection of X-radiographs of all iron objects, a selection of non-ferrous artefacts (including coins), and a sample of any industrial debris relating to metallurgy. A rapid scan of all excavated material should be undertaken by conservators and finds researchers in collaboration. Material considered vulnerable will be selected for stabilisation after specialist recording. Where intervention is necessary, consideration will be given to possible investigative procedures (e.g glass composition studies, residues in or on pottery, and mineral preserved organic material). Once assessed, all material will be packed and stored in optimum conditions, as described in *First Aid For Finds*. Waterlogged organic materials should be dealt with, following Historic England documents, *Guidelines for the care of waterlogged archaeological leather*, and guidelines on the recording, sampling, conservation and curation of waterlogged wood.

- f) A specialist assessment of environmental samples taken, with a view to their potential for subsequent study.

Processing of all samples collected for biological assessment, or sub-samples of them, will be completed. Bulk and site-riddled samples from dry deposits should have been processed during excavation, where possible.

The preservation state, density and significance of material retrieved must be assessed, following methods presented in Environmental Archaeology and archaeological evaluations, or existing local guidelines, until national guidelines are available. Unprocessed sub-samples must be stored in conditions specified by the appropriate specialists.

Assessments for any technological residues will be undertaken. Samples for dating must be submitted to laboratories promptly, so as to ensure that results are available to aid development of specifications for subsequent mitigation strategies.

- g) The results from investigations in archaeological sciences will be included in the Site Archive and presented in the Evaluation Report. Reports must include sufficient detail to permit assessment of potential analysis. They will include tabulation of data in relation to site phasing and contexts, and must include non-technical summaries. The objective presentation of data must be clearly separated from interpretation. Recommendation for further investigation (both on samples already collected, and at future excavations) must be clearly separated from the results and interpretation.
- h) An assessment of the archaeological significance of the deposits identified, in relation to other sites in the region.
- i) A conclusion with recommendations for further post-excavation work, if required.
- j) Detailed archive location and destination.
- k) Appendices and figures, as appropriate, including a copy of the specification and/or project design.
- l) References and bibliography of all sources used

7.3 Copies of the report will be submitted to the commissioning body, the Local Planning Authority and the North Yorkshire Historic Environment

Record within an agreed timetable and subject to any contractual requirements on confidentiality (see 8.1 below).

7.4 We will provide a digital copy of the report in PDF format to the North Yorkshire Historic Environment Record Office.

7.5 A Brief, interim report may be required shortly after the completion of fieldwork.

7.6 The following Specialists have been contacted as are available to work on the project:

Pottery - T G Manby (Prehistoric),

M R Stephens (medieval and Post-medieval)

P A Ware (Roman)

Flint - P Makey

Animal Bone – Jane Richardson

Environmental Sampling – Diane Alldritt

Conservation – York Archaeological Trust

Human Remains – York Osteology

Ceramic Building Material – Dr Phil Mills

Clay Tobacco Pipe - M R Stephens

8. Copyright, Confidentiality and Publicity

8.1 Unless the individual/organisation commissioning the project wishes to state otherwise, the copyright of any written, graphic or photographic records and reports rests with MAP.

9. Archive Preparation and Dissemination

- 9.1 The requirements for archive preparation and deposition must be addressed and undertaken in a manner agreed with the recipient museum: in this instance, the Yorkshire Museum is recommended. The recipient museum will be contacted at an early stage, before submission of the project design and before commencement of fieldwork.
- 9.2 A site archive should be prepared in accordance with the specification outlined in *Management of Archaeological Projects* (MoRPHE (Lee, E, 2006)). See also *Towards an Accessible Archaeological Archive, the Transfer of Archaeological Archives to Museums: Guidelines for use in England, Northern Ireland, Scotland and Wales* Society of Museum Archaeologists 1995.
- 9.3 The site archive, including finds and environmental material, subject to the permission of the relevant landowners, will be labelled, conserved and stored according to the United Kingdom Institute for Conservation (UKIC)'s. Provision will be made for the stable storage of paper records and their long term storage on a suitable medium, such as microfilm, a copy of which should be deposited with the NMR (Historic England). An index to the contents of the archive together with details of its date and place of deposition should be lodged with the SMR.
- 9.4 Archive deposition must be arranged in consultation with the recipient museum and the Principle Archaeologist at North Yorkshire County Council and must take account of the requirements of the recipient museum and the relevant guidelines (see above) relating to the preparation and transfer

of archives. The timetable for deposition shall be agreed on completion of the site archive and narrative.

10. Bibliography

Phase Site Investigations. 2021. Land on Thornfield Road, Nosterfield, North Yorkshire. Archaeological Geophysical Survey.

11. Best Practice & Scientific Guidance

Archaeological Conservation

Investigative Conservation: Guidelines on how the Detailed Examination of Artefacts from Archaeological Sites can Shed Light on their Manufacture and Use (2008): Officially archived, but available on request.

Guidelines on the X-radiography of Archaeological Metalwork (2006):
<https://historicengland.org.uk/images-books/publications/x-radiography-of-archaeological-metalwork/>

Waterlogged Organic Artefacts: Guidelines on their Recovery, Analysis and Conservation (2018):
<https://historicengland.org.uk/images-books/publications/waterlogged-organic-artefacts/>

Environmental Archaeology

Animal Bones and Archaeology - Recovery to Archive (2019):
<https://historicengland.org.uk/images-books/publications/animal-bones-and-archaeology/>

Deposit Modelling and Archaeology: Guidance for Mapping Buried Deposits (2020): <https://historicengland.org.uk/images-books/publications/deposit-modelling-and-archaeology/>

Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (Second Edition) (2011): <https://historicengland.org.uk/images-books/publications/environmental-archaeology-2nd/>

Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (2015): <https://historicengland.org.uk/images-books/publications/geoarchaeology-earth-sciences-to-understand-archaeological-record/>

Guidelines for the Curation of Waterlogged Macroscopic Plant and Invertebrate Remains (2008): Currently being revised, but available on request.

Mineralised Plant and Invertebrate Remains: A Guide to the Identification of Calcium Phosphate Replaced Remains (2020): <https://historicengland.org.uk/images-books/publications/mineralised-plant-and-invertebrate-remains/>

Geophysical Survey

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APPENDIX 1

Conservation Strategy By Ian Panter of York Archaeological Trust

Artefacts from all categories and all periods will be recovered as a matter of routine during the excavation. When retrieved from the ground finds will be kept in a finds tray or appropriate bags in accordance with **First Aid for Finds**. Where necessary, a conservator may be required to recover fragile finds from the ground depending upon circumstances.

If waterlogged conditions are encountered a wide range of organic materials may be recovered, including wood, leather and textiles. Advice will be sought from a conservator to discuss optimum storage requirements before any attempt is made to retrieve organic finds and structural timbers from the ground.

After the completion of the fieldwork stage, a conservation assessment will be undertaken which will include the X-radiography of all the ironwork (after initial screening to separate obviously modern debris), and a selection of the non-ferrous finds (including all coins). A sample of slag may also be X-rayed to assist with identification and interpretation. Wet-packed material, including glass, bone and leather will be stabilised and consolidated to ensure their long-term preservation. All finds will be stored in optimum conditions in accordance with **First Aid for Finds** and **Guidelines for the Preparation of Excavation Archives for Long-Term Storage** (Walker, 1990).

Waterlogged wood, including structural elements will be assessed following the English Heritage guidelines, **Waterlogged wood: sampling, conservation and**

curation of structural wood (Brunning 1996). The assessment will include species identification, technological examination and potential for dating.

The conservation assessment report will include statements on condition, stability and potential for further investigation (with conservation costs) for all material groups. The conservation report will be included in the updated project design prepared for the analysis stage of the project.

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APPENDIX 2

Environmental Strategy By Diane Alldrit

The on-site environmental sampling strategy will systematically seek to recover a representative sample of botanical, molluscan (both terrestrial and aquatic), avian and mammalian evidence from the full range of contexts encountered during the excavation. This will enable, at the assessment stage, the possibility for radiocarbon dating material to be obtained, and for an initial analysis of the economic and environmental potential of the site. In order to achieve this, a bulk sample (BS, Dobney *et al* 1992) comprising an optimum size of 40litre of sediment (where possible) should be taken from **every stratigraphically secure and archaeologically significant context**. In practice it may not always be possible to obtain 28l of sediment from certain features during the assessment stage, for instance from partially excavated pits or post-holes, in which case a single bucket sample, c.10 to 14litre should be taken at the site supervisors discretion. Deposits of mixed origin, for instance topsoil, wall fills and obvious areas of modern contamination, should be avoided where possible, as these will contain intrusive material and not provide secure radiocarbon dates.

All buckets and other sampling equipment must be clean and free of adherent soil in order to prevent cross-contamination between samples. If dry soil is to be stored for any length of time it should be kept in cool, dry conditions, and away from strong light sources. However, it is preferable to process samples as soon as possible after excavation.

Bulk soil samples shall be processed using an Ankara-type water flotation machine (French 1971) for the recovery of carbonised plant remains and charcoal. The

flotation tank should contain a >1mm mesh for collection of the retent or 'residue' portion of the sample (which may contain pottery, lithics and animal / bird bone, in addition to the heavier fragments of charcoal which do not float). The 'flot' portion of the sample, which may include carbonised seeds, cereal grain, charcoal and sometimes mollusc shell, should be captured using a nest of >1mm and >300micron Endicot sieves. Flotation equipment, including sieves, meshes, brushes and so forth must be meticulously cleaned between samples in order to prevent contamination of potential radiocarbon dating material. All material resulting from flotation will be dried prior to microscopic examination. Flotation is not suitable for the recovery of pollen or for processing waterlogged samples, which shall be discussed below.

Where there is potential for waterlogged preservation, shown for instance by the presence of wood and other organic or wet material, then a 5 to 10litre size sample should be taken (GBA sample, Dobney *et al* 1992). This material is to be retained for later processing using laboratory methods to enable the recovery of waterlogged plant material and insects. For assessment purposes a 1litre sub-sample of the organic sediment from each potential waterlogged sample shall be processed using laboratory wash-over methods, and once processed **kept wet**. All waterlogged samples awaiting processing should be kept damp, preferably stored in plastic sealable tubs, and in cool conditions. Where large waterlogged timbers are recovered these should be stored under refrigerated conditions and an appropriate conservator consulted.

There is the possibility that the waterlogged deposits may require parasite egg analysis. It is proposed that the 'squash' technique is adapted, this would require small lumps of raw sediment approximately 3mm in diameter taken from three separate points from within the sample and homogenised in a little water by

shaking. After allowing coarse particles to settle for a few moments, a drop of the supernatant was removed. This work would be undertaken by either John Carrott or Harry Kenwood if necessary.

If sediment suitable for pollen analysis is encountered, for instance rich organic peaty deposits, or deep ditch sections with organic preservation, the archaeobotanical specialist is to be consulted prior to any sampling taking place. These deposits would require sampling with large kubiena tins and require the specialist to be on-site. Pollen analysis, even at assessment level, would subsequently impose a considerable cost implication should it be carried out.

The specialist is available to provide consultation and advice on the environmental sampling strategy throughout the course of the excavation and during post-excavation processing if required.

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