

**WRITTEN SCHEME OF INVESTIGATION FOR
ARCHAEOLOGICAL EVALUATION**

**WYKEHAM QUARRY
NORTH YORKSHIRE**

NGR SE 990 825

APPENDIX 1

**Prepared by MAP Archaeological Consultancy Ltd
on behalf of Hanson Ltd**

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1. Summary

1.1 This Written Scheme of Investigation has been prepared by MAP Archaeological Consultancy Ltd in advance of a Planning Application to extend Wykeham Quarry. Previous evaluation has been carried out on the proposed extraction areas, but as part of the proposals an area has recently been identified for a Silt Lagoon measuring 1.35 hectares. The evaluation technique proposed is archaeological trial trenching. The area has been recently cleared of trees and is rough ground. It is understood that the area has been planted and felled on previous occasions and fieldwalking or geophysical survey would therefore not be informative evaluation techniques.

1.2 The aim of this work is to establish the nature, location, extent and state of preservation of archaeological remains within the development area. The results of this work will enable the archaeological impact of the development to be fully appreciated and an appropriate design mitigation, and/or further archaeological work, to be agreed to preserve archaeological deposits either *in situ*, or by record. This Scheme of Investigation has been prepared by MAP Archaeological Consultancy at the request of Andrew Josephs acting on behalf of Hanson Ltd.

2. Purpose

2.1 This written scheme of investigation represents a summary of the broad archaeological requirements to enable an assessment of the impact of development proposals upon the archaeological resource. This is in accordance with policies within the Scarborough Borough

Local Plan, those of North Yorkshire County Council and the guidance of Planning Policy Statement PPS5.

3. Location and Description (centred at NGR SE 990 825)

- 3.1 The extent of the area to be evaluated is indicated on a site location plan (Fig. 1). The proposed Silt Lagoon comprises an area measuring 1.35 hectares and has recently been cleared of trees. It is understood that the area has been planted and felled on previous occasions.
- 3.2 The site lies on soils of the Burlingham 2 Association (572o), which are "deep fine loamy soils with slowly permeable subsoils that are affected by seasonal waterlogging (SSEW 1983) over a solid geology of Kimmeridge clay (BGS 1998).

4. Historical and Archaeological Background (see Fig 2)

- 4.1 Excavation and fieldwork have demonstrated that at Star Carr, Flixton Carr and Seamer Carr Later Upper Palaeolithic and extensive Mesolithic landscape survives partially buried beneath accumulated peat deposits. All of these sites were located along the former shoreline of the lake close to the 24m to 25m OD subsurface contour where dry land provided an excellent base from which to exploit the rich wetland resource of the swamps, carr and open water.
- 4.2 Records of stray Palaeolithic, Neolithic and Bronze Age finds within the Vale (Sites 18 to 24) indicate that the area supported a population throughout earlier prehistory and that occupation and settlement was not just confined to the Mesolithic period. The nomadic nature of this population, however, makes it difficult to identify their settlement or occupation sites although it is considered that camp-sites may have favoured the slightly elevated sand hills around the margins of the lakes.

- 4.3 Within 1km of the proposed extensions, cropmark evidence from aerial photography record several enclosure, field system and trackway complexes (Sites 2 - 7). These complexes appear to be concentrated on the higher ground associated with the Wykeham moraine and the higher glacial ridges extending into the Vale. They probably have their origins in the Iron Age and Roman period, but as excavations at Wykeham (Site 11) and Crossgates (Site 12) have demonstrated these sites could also incorporate Anglo-Saxon remains. Site 6 lies 250m north-east of the northern extension area and this may be part of a ladder settlement extending southwards along defined ridges of glacial deposits from more extensive ladder settlement running east to west along the northern edge of the Vale (Sites 3, 4, 5 and 9). The ridge on which Site 6 is situated is at 30.25m AOD.
- 4.4 The proposed extensions lie within the former township of West Ayton that formed part of the Manor of Hutton Bushel. There is no cartographic or documentary evidence to suggest any settlement within the proposed extensions during either the Medieval or post-Medieval periods. A Plan of the Manor of Hutton Bushel dated 1838 (NYCRO ZDS M 3/3) suggests the land was probably owned at this date by Lady Hewley's Trustees and shows the extensions being unenclosed. Some fields are shown to the west and east of the northern extension, but none near the southern extension. This suggests that the areas were marginal, boggy carr in the Medieval and post-Medieval periods, and prone to seasonal flooding.
- 4.5 Desk-based assessment, geophysical survey, fieldwalking and auger surveys were undertaken during 2003 as part of an EIA for the currently permitted working area (which extends to 19ha). The geophysical survey did not identify any definitive archaeological targets, but anomalies indicative of palaeochannels indicate that the technique was effective when using a 1m gradiometer. Fieldwalking recovered two flint artefacts at about 26.60m AOD: an end scraper and a serrated edge blade. Both implements could be found in later Mesolithic assemblages but an early to middle Neolithic date was

considered most probable. The results of the auger survey showed that the deposits at Wykeham are very different from those at the eastern end of the Vale, and that the site was periodically covered by deep water associated with a former lake. No areas of outcropping gravels were identified and there were no thick deposits of post-glacial peat. The assessment showed that the deposit was laid down in varying depths of open water between about 10,000 bc and 8,000 bc and that although the lake water level fluctuated, there were periods when it exceeded 26m OD, considerably higher than that recorded to the east around Seamer.

- 4.6 The results of the above evaluation techniques accurately predicted the findings of post-consent investigations. No archaeological features have yet been discovered, but the palaeoenvironmental work funded by Hanson has already made a significant contribution to the palaeoenvironmental reconstruction of the Vale providing a high-resolution record of environmental change, as summarised below.

- 4.7 Since consent Northern Archaeological Associates have been co-ordinating the recording of quarry sections as part of each phase of development in fulfillment of the planning conditions. This has involved a multi-disciplinary approach to sampling using a combination of sediment physical properties, assessment for pollen, plant and insect remains and C14 dating.

- 4.8 Archaeological Trial Trenching was carried out by MAP Archaeological Consultancy Ltd during October, November and December 2009 on the two blocks of land that form the proposed extension to Wykeham Quarry. The work followed three previous stages of field evaluation that comprised an auger survey, geophysics and fieldwalking. A total of 108 trial trenches were excavated (c. 10,700m²): 51 in the northern area,

and 57 in the southern. Trenches 1-51 were excavated in the northern area and recorded two post-medieval linear features and two possible prehistoric pits. In the southern area (Trenches 52-108) a complex of Late Iron Age/Romano-British linear features and pits representing a settlement were identified on a low sand-hill, along with further post-medieval linear features. A significant assemblage of pottery was recovered, along with two fragments of rotary quern, a copper-alloy fibula-type brooch and animal bone fragments.

- 4.9 The depositional sequence reflects a complex sequence of palaeoenvironmental change during the later late glacial into the early Holocene. The work done to date clearly demonstrates that this is an important palaeoenvironmental site both regionally and nationally.
- 4.10 It commences with diamict/gravel deposition in association with deglaciation and meltwater discharge through the Forge Valley. This material could have been deposited in a lake or outwash fan.
- 4.11 The lower organic clays/peat above this layer indicates wetland conditions dating to the Windermere Interstadial (Zone II). In some parts of the quarry the preservation of these deposits has been excellent and is showing two bands of shallow organic sediments separated by a shallow layer of silts. They indicate marginal lake deposits with the presence of fresh straps of *Phragmites* and plenty of seeds indicating that hydroseral development was occurring in Zone II. The pollen, plant and insect remains indicate warm climatic conditions much like today. This is probably the earliest hydroseral development sequence found in the Vale.
- 4.12 The overlying thick laminated clays date to the Loch Lomond Stadial (Zone III). They indicate deposition in standing water conditions, most

likely a lake with a considerable extent and depth. These deposits were laid down in a periglacial environment over a period of about 1,000 years.

- 4.13 As the Loch Lomond Stadial came to an end, the deposits indicate that climatic warming led to the re-establishment of vegetation across the catchment with the formation of peat across the wetland. During this period lake levels fell and by the Mesolithic period this was an area of active river channel activity as the Derwent established itself across the floodplain. The river appears to have crossed the current quarry several times, some of the ancient channels also being visible in both aerial photographs and the geophysical survey results.
- 4.14 Unfortunately, the post-glacial deposits within the current quarry have been heavily eroded through the effects of drainage and agriculture and only survive as a fragmentary, very thin layer overlying the Late-glacial deposit.

5. Objectives

5.1 The objectives of the archaeological evaluation work within the proposed silt lagoon area are:

1. to determine by means of trial trenching, the nature, depth, extent and state of preservation of any archaeological deposits and to identify the presence of palaeochannels that may cross the area. Trial trenches of sufficient size and depth to provide this information will be excavated, and archaeological deposits will be explicitly related to depths below existing surface and actual heights in relation to Ordnance Datum.
2. to prepare a report summarising the results of the work and assessing the archaeological implications of proposed development.
3. to prepare and submit a suitable archive to the appropriate museum.

6. Access, Safety and Monitoring

- 6.1 Access to the site will be arranged through the commissioning body.
- 6.2 It is the archaeological contractor's responsibility to ensure that Health and Safety requirements are fulfilled.
- 6.3 The project will be monitored by the Senior Archaeologist, North Yorkshire County Council, to whom written documentation should be sent before the start of the Evaluation confirming: a) the date of commencement, b) the names of all finds and archaeological science specialists likely to be used in the evaluation, and c) notification to the

proposed archive repository of the nature of the works and opportunity to monitor the works.

6.4 Where appropriate, the advice of the Regional Archaeological Science Advisor for Archaeological Science (Yorkshire & The Humber region) at English Heritage will be called upon.

6.5 It is the archaeological contractor's responsibility to ensure that monitoring takes place by arranging monitoring points as follows:

1. a preliminary meeting or discussion at the commencement of the contract to agree the locations of the proposed trial trenches.
2. progress meeting(s) during the fieldwork phase at appropriate points in the work schedule, to be agreed.
3. a meeting or discussion during the post-fieldwork phase to discuss the draft report and archive before completion.

6.6 It is the responsibility of the archaeological contractor to ensure that any significant results are brought to the attention of the Archaeologist, North Yorkshire County Council and the commissioning body as soon as is practically possible.

7. Scope of Work

7.1 The proposed silt lagoon area is 1.35 ha in size. It is suggested that 415m² of trial trenching should be excavated within this area representing just over 3% of the total area. The trial trenches will determine the nature, depth, extent and state of preservation of archaeological deposits across the site. It is proposed that there should be four trial trenches (Fig. 1) measuring 2 x 30m and seven boxes at 5 x 5m. The project should be undertaken in a manner consistent with

the guidance of MAP2 (English Heritage, 1991) and professional standards and guidance (IFA, 1999).

- 7.2 In case of query as to the extent of investigation, a site meeting shall be convened with the Senior Archaeologist, North Yorkshire County Council.
- 7.3 In the area of each trench, overburden such as crop, turf, topsoil, made ground, rubble or other superficial fill materials may be removed by machine using a back-acting excavator, which should be fitted with a toothless or ditching bucket. Mechanical excavation equipment shall be used judiciously, under archaeological supervision down to the top of archaeological deposits, or the natural subsoil (C Horizon or soil parent material), whichever appears first. Hand-excavation of all archaeological deposits will be necessary. Topsoil will be kept separate from subsoil or fill materials. The need for, and any methods of, reinstatement will be agreed with the commissioning body in advance of submission of tenders.
- 7.4 Once overburden/topsoil has been removed, the surface will be cleaned and an assessment made of any archaeological remains on the site. Using the information and artefacts collected to this stage, all features and deposits should be assessed as to their origin or function, probable date, and importance for further recording. Features and layers identified as having potential for further recording should be excavated by hand, sampled, and recorded as set out below. Further machining may be required to investigate the depth of any palaeochannels.
- 7.5 All deposits should be fully recorded on standard context sheets, photographs and conventionally scaled plans and sections. Each trench area should be recorded to show the horizontal and vertical distribution of contexts. Normally, all four sides of a trench should be recorded in section. Fewer sections can be recorded only if there is a

substantial similarity of stratification across the trench. The elevation of the underlying natural subsoil where encountered will be recorded. The limits of excavation will be shown in all plans and sections, including where these limits are coterminous with context boundaries.

- 7.6 Should any human remains be encountered, these will be left *in situ* following the determination of the extent of the remains and grave cut(s).
- 7.7 Metal detecting, including the scanning of topsoil and spoil heaps, will only be permitted subject to archaeological supervision and recording so that metal finds are properly located, identified, and conserved. All metal detection should be carried out following the Treasure Act 1996 Code of Practice.
- 7.8 Due attention will be paid to artefact retrieval and conservation, ancient technology, dating of deposits and the assessment of potential for the scientific analysis of soil, sediments, biological remains, ceramics and stone. All specialists (both those employed in-house and those sub-contracted) should be named in project documentation, their prior agreement obtained before the fieldwork commences and opportunity afforded for them to visit the fieldwork in progress.
- 7.9 Finds should be appropriately packaged and stored under optimum conditions, as detailed in *First Aid for Finds* (Watkinson & Neal, 1998).
- 7.10 The character, information content and stratigraphic relationships of features and deposits should be determined and a running section along the excavation area, from highest to lowest point, should be recorded to show the vertical distribution of layers. All linear features, such as ditches, should have their shape, character, and depth determined by hand excavation of sections. A minimum sample of 20% of each linear feature of less than 5m in length and a minimum sample of 10% of each linear feature greater than 5m in length (each section

will be not less than 1m wide) should be excavated. All junctions of linear features should have their stratigraphic relationships determined, if necessary using box sections. A 100% sample of all stake-holes should be excavated, and all pits, post-holes and other discrete features should be half-sectioned by hand to record a minimum of 50% of their fills, and their shape. Any other unknown or enigmatic features should be investigated similarly. Large pits, post-holes or deposits of over 1.5m diameter should be excavated sufficiently to define their extent and to achieve the objectives of the investigation, but should not be less than 25%. All intersections should be investigated to determine the relationship(s) between features.

- 7.11 Scientific investigations should be undertaken in a manner consistent with the English Heritage best-practice guidelines (2003).
- 7.12 Where there is evidence for industrial activity, macroscopic technological residues (or a sample of them) should be collected by hand. Separate samples (c. 10ml) should be collected for micro-slugs hammer-scale and spherical droplets). In these instances, the guidance of English Heritage (2001) and Jones (*ed* 2006) should be followed.
- 7.13 Samples should be collected for scientific dating (radiocarbon, dendrochronology, luminescence dating, archaeomagnetism and/or other techniques as appropriate), following an outline strategy presented to the Senior Archaeologist, NYCC.
- 7.14 Where appropriate, buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Samples may be collected for analysis of chemistry, magnetic susceptibility, particle size, micromorphology and/or other techniques as appropriate, following an outline strategy presented to the Senior Archaeologist, NYCC, and in consultation with the geoarchaeologist. The guidance of Canti (1996) and English Heritage (2002) should be followed.

- 7.15 Deposits should be sampled for retrieval and analysis of all biological remains. The sampling strategy should include a reasoned justification for selection of deposits for sampling, and should be developed in collaboration with a recognised bioarchaeologist. Sampling methods should follow the guidance of the Association for Environmental Archaeology (1995) and English Heritage (2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should 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.
- 7.16 All securely stratified deposits should be sampled, from a range of representative features, including pit and ditch fills, postholes, floor deposits, ring gullies and other negative features. Positive features should also be sampled. Sampling should also be considered for those features where dating by other methods (for example pottery and artefacts) is uncertain. Bulk samples should be collected from contexts containing a high density of bones. Spot finds of other material should be recovered where applicable.
- 7.17 Coarse sieved samples for the recovery of animal bones and other artefact/ecofact categories should be 100 litres plus. Flotation samples, for the recovery of charred plant remains, charcoal, small animal bones and mineralised plant remains, should be between 40 and 60 litres in size, although this will be dependent upon the volume of the context. Entire contexts should be sampled if the volume is low. Whenever possible, coarse sieved samples (wet or dry) and flotation samples should be processed during fieldwork to allow the continuous reassessment and refinement of sampling strategies. Samples from waterlogged and anoxic deposits, which might contain plant macros and entomological evidence, taken for General Biological Analysis (GBA), should normally be 20 litres in size. The English Heritage guidance should be consulted for details of sample size for other

specialist samples which may be required. Allowance should be made for a site visit from the contractor's environmental specialists/consultants where appropriate.

7.18 The specialists that MAP Archaeological Consultancy Ltd. use are as follows:

Conservation	Ian Panter	YAT	01904 612529
Prehistoric Pottery	Terry Manby		01430 873147
Roman Pottery	Paula Ware	MAP	01653 697752
Pre-conquest Pottery	Mark Stephens	MAP	01653 697752
Medieval Pottery	Mark Stephens	MAP	01653 697752
Post Medieval Pottery	Mark Stephens	MAP	01653 697752
Clay Tobacco Pipe	Mark Stephens	MAP	01653 697752
CBM	Anne Finney	MAP	01653 697752
Animal Bone	Anne Finney	MAP	01653 697752
Small Finds	Hilary Cool		0116 981 9065
Leather	Ian Carlisle		
Textile	Penelope Walton Rogers	Textile Research in Archaeology	01904 634585
Slag/Hearths	Jerry McDonnell	Bradford University	01274 383 5131
Flint	Pete Makey		01377 253695
Environmental Sampling	David Berg/Diane Allitt	WYAS	0113 3837515

Human Remains	Malin Holst	York Osteology Ltd	01904 737509
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7.19 Upon completion of archaeological field recording work, an appropriate programme of analysis and publication of the results of the work should be completed. Post excavation assessment of material should be undertaken in accordance with the guidance of MAP2 (English Heritage, 1991).

7.20 Where appropriate, the advice of the English Heritage Regional Advisor for Archaeological Science, Yorkshire Region may be called upon to monitor the archaeological science components of the project.

8. Archive

8.1 A field archive should be compiled consisting of all primary written documents, plans, sections and photographs should be produced and cross-referenced. Archive deposition should be undertaken with reference to the County Council's *Guidelines on the Transfer and Deposition of Archaeological Archives*.

8.2 The archaeological contractor should liaise with an appropriate museum to establish the detailed requirements of the museum and discuss archive transfer in advance of fieldwork commencing. The relevant museum curator should be afforded to visit the site and discuss the project results. In this instance, the Malton Museum is suggested.

8.3 The archiving of any digital data arising from the project should be undertaken in a manner consistent with professional standards and guidance (Richards & Robinson, 2000). The archaeological contractor should liaise with an appropriate digital archive repository to establish their requirements and discuss the transfer of the digital archive.

8.4 The archaeological contractor should also liaise with the HER Officer, North Yorkshire County Council, to make arrangements for digital information arising from the project to be submitted to the North Yorkshire Historic Environment Record for HER enhancement purposes. The North Yorkshire HER is not an appropriate repository for digital archives arising from projects.

9. Report

9.1 A summary report shall be produced following the County Council's guidance on reporting: Reporting Check-List.

9.2 All excavated areas should be accurately mapped with respect to nearby buildings and roads.

9.3 At least five copies of the report should be produced and submitted to the commissioning body, North Yorkshire County Council Heritage Section HER, the Local Planning Authority, the museum accepting the archive and the English Heritage Regional Advisor for Archaeological Science.

9.4 Copyright in the documentation prepared by the archaeological contractor and specialist sub-contractors should be the subject of an additional licence in favour of the museum accepting the archive and North Yorkshire County Council to use such documentation for their statutory educational and museum service functions, and to provide copies to third parties as an incidental to such functions.

9.5 Under the Environmental Information Regulations 2005 (EIR), information submitted to the HER becomes publicly accessible, except where disclosure might lead to environmental damage, and reports cannot be embargoed as 'confidential' or 'commercially sensitive'. Requests for sensitive information are subject to a public interest test,

and if this is met, then the information has to be disclosed. The archaeological contractor should inform the client of EIR requirements, and ensure that any information disclosure issues are resolved before completion of the work. Intellectual property rights are not affected by the EIR.

- 9.6 If the archaeological fieldwork produces results of sufficient significance to merit publication in their own right, allowance should be made for the preparation and publication of a summary in a local journal, such as the *Yorkshire Archaeological Journal*. This should comprise, as a minimum, a brief note on the results and a summary of the material held within the site archive, and its location.
- 9.7 Upon completion of the work, the archaeological contractor should make their work accessible to the wider research community by submitting digital data and copies of reports online to OASIS (<http://ads.ahds.ac.uk/project/oasis/>). Submission of data to OASIS does not discharge the planning requirements for the archaeological contractor to notify the Senior Archaeologist, NYCC of the details of the work and to provide the Historic Environment Record (HER) with a report on the work.

10. References

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11. Additional Information

This brief was completed on 8th October 2010 by:

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