

**IMPLEMENTATION OF ARCHAEOLOGICAL MITIGATION SCHEME REQUIRED BY
CONDITION 23 (ARCHAEOLOGY) OF PLANNING PERMISSION F/2010/05/CM.
PROPOSAL BY HANSON BUILDING PRODUCTS TO CONTINUE THE IN-SITU
PRESERVATION OF THE BURIED TIMBER PLATFORM SITE
LAND AT: MUST FARM QUARRY & KING'S DYKE, PETERBOROUGH ROAD,
WHITTLESEY, PETERBOROUGH
LPA REF: F/2010/05/CM**

To: Planning Committee

Date: 12 June 2014

From: Head of Growth and Economy

**Electoral
division(s): Whittlesey South**

Purpose: To consider this report

Recommendation: That the proposal by Hanson Building Services Limited to supplement and continue with the mitigation strategy aimed at the preservation in situ of the preserved occupation deposits of a nationally important Late Bronze Age piled timber settlement platform at Must Farm Quarry be refused and the Company asked to submit a strategy for its excavation to conserve the historic interest of the site by record within the next three months.

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1.0 INTRODUCTION

- 1.1 This proposal by Hanson Building Services Limited seeks approval for a revised strategy to ensure that the buried archaeological deposits associated with a nationally important Bronze Age site (a timber settlement platform) are maintained in an environment considered to be conducive to their continuing survival. In preparing the revised strategy the applicant has had regard to the results of past monitoring of the scheme since its inception in 2007

2.0 THE SITE

- 2.1 Must Farm Quarry is located approximately 2km to the south-east of Peterborough on the western edge of Whittlesey and forms part of the wider Must Farm and King's Dyke development which includes mineral extraction, mineral storage and processing, and a concrete block manufacturing facility. The boundary of the quarry is defined by the Peterborough to March railway line to the north, by the King's Dyke drain and the A605 to the south, by Funtham's Lane to the east, and by agricultural land to the west.
- 2.2 Oxford clay excavated from the quarry is used to manufacture Fletton bricks in the adjacent King's Dyke brickworks. The quarry and the associated brickworks are operated by Hanson Building Products Limited (Hanson).
- 2.3 The remains of a preserved Late Bronze Age timber settlement platform was discovered during site preparation works for quarrying in 2005. The area of land in question lies in an elevated location 30 metres above the quarry floor along part of the south eastern boundary of the site overlooking part of an area that had been previously been worked for brick clay (see para 3.1 below). The site extends over an area of 50m x 15m E-W being bisected by pipe trenches and backfilled cuts from events undertaken at the site before it was discovered. Further details of the archaeological finds encountered and their significance is included as Appendix 1 of this report.

3.0 PLANNING HISTORY

- 3.1 The Must Farm and King's Dyke area has a long and complex planning history. The eastern part of Must Farm was originally granted consent, along with other parts of the Whittlesey brickworks complex, in 1947 as part of an Interim Development Order (IDO ref: F/1015/91). A pit, known as Old Must Pit, was excavated for clay in 1960 and occurs at the eastern edge of the application area. The IDO consent was registered as a valid permission in accordance with the requirements of the Planning and Compensation Act 1991 and a new schedule of planning conditions was approved in 1993 (Ref: F/321/93).

3.2 Following the process of environmental impact assessment planning permission was granted on 2 January 2007 under LPA ref F/2010/05/CM, subject to conditions, for the extraction and processing of sand and gravel from areas where mineral (clay) was already consented; extraction of clay, sand and gravel over areas to the west of the consented area; export of surplus soils from the extraction area; conveyors to transport the material to the King's Dyke brick works; a clay store, sand and gravel processing plant and a concrete block manufacturing plant at King's Dyke.

3.3 The planning permission granted in 2007 included a condition to safeguard the archaeology resource as set out below:

No development shall take place until the applicant has secured the implementation of an approved scheme of archaeological investigation and mitigation, which shall have been submitted by the applicant and approved in writing by the Mineral Planning Authority. The approved scheme shall be based upon the details provided in Section 15 Volume 2 Environmental Statement March 2005 and paragraphs 8.1 to 8.67 of the supplementary information document January 2006 and include the following components:

a) Mitigation details for the preservation in situ of the prehistoric timber site situated at the southern shore of the existing Must Farm Pit.

b) Fieldwork in accordance with an approved scheme of investigation.

c) Post-excavation assessment to be submitted within six months of the completion of the fieldwork unless otherwise approved in writing with the Mineral Planning Authority.

d) Completion of post-excavation analysis, preparation of site archive ready for deposition at a store approved by the Mineral Planning Authority, Completion of an archive report, and submission of a publication report either as a referred monograph or an academic journal to be completed within 2 years of the completion of the fieldwork unless otherwise previously approved by the Minerals Planning Authority.

3.4 A scheme of archaeological mitigation for the quarry was submitted by the developer which was subsequently approved in writing by the Mineral Planning Authority (MPA) on 24 August 2007. This scheme encompassed a mitigation strategy for a monitored "preservation in situ scheme" for the Timber Platform

Site (TPS), with the flexibility to accommodate variation if conditions are not conducive for long-term preservation, and strategies for the excavation of the archaeological sites within the quarry's extraction areas where preservation is not an option.

- 3.5 Attempts to preserve such remains in situ, to conserve their interest for future generations, are always considered as a first option, and this was the case when the site gained consent in 2007 (Planning Policy Guidance: Note 13 Archaeology & Planning). If this cannot be achieved, or if a site's environment is found to be unable to sustain appropriate water and geochemical conditions, such sites require excavation to remove fragile remains from processes of decay, thereby conserving their interest "by record" through publication.
- 3.6 The approved scheme of mitigation has been implemented following re-burial in 2007 and sensitive monitoring equipment installed thereafter to record soil and water conditions within the site. Arrangements for allowing ground water to enter the deposit sequence of the site meant that the quarry's encircling cut-off wall (formed by cutting a deep vertical trench and pumping bentonite clay into it, designed to prevent water entering the extraction pit and thus enabling dry working conditions) was stopped to either side of the TPS and replaced by a clay bund around its northern edge. This was keyed into the bentonite wall. However, difficulties with the insertion of the bentonite wall through the fen clay deposits to the correct Oxford clay depth meant that it required re-engineering on two occasions: water was not contained behind the wall and leaked out from the TPS.
- 3.7 Hanson later extended the site's clay bund northward, without archaeological agreement or acknowledgement, in order to build a haul road upon it for internal transportation within the quarry.

4.0 HYDROLOGICAL & GEOCHEMICAL MONITORING

- 4.1 The groundwater surrounding the TPS has been monitored since 2007 to see if the deposits were subject to hydrological change since quarrying began and to determine whether preserving conditions prevailed at the site. Hanson's advisors, SLR Consultants, and a conservator from York Archaeological Trust analyse readings taken by Hanson staff from monitoring points installed at the

Site and present twice yearly reports which are reviewed by an Advisory Panel (AP). English Heritage science advisers, the Inspector of Ancient Monuments, a geomorphological specialist from the University of Cambridge and CCC's archaeologist are contributing members of the Advisory Panel.

- 4.2 The data has been of variable quality for various reasons, but, significantly, groundwater level data shows that the deposits that contained the highly sensitive cultural horizon were dry for prolonged periods in each year between 2008 and 2011, whereas they should have been fully saturated to ensure the exclusion of oxygen from the deposits and the preservation of fragile organic remains within them. The change in the groundwater water levels has been caused by various quarry operational activities and has allowed oxygen to enter the cultural horizon and introduce unwanted oxidising conditions.
- 4.3 In 2012 a water sample was taken from a pond of water that appeared above the surface of the TPS from an unknown source. The sample contained extremely high concentrations of sulphate and a small amount of nitrate. Nitrates and sulphates are oxidants which increase the rate of decay of organic material should they come into contact with them. Monitoring data in 2012 recorded high groundwater conditions and saturation conditions at the site for the first time since the 2006-7 evaluation, although groundwater levels continued to fluctuate during the year. However, the very high sulphate levels are likely to have been harmful to fragile remains.
- 4.4 Despite the fluctuating data graphs shown in their reports, Hanson's consultants have argued that the monitoring results indicate suitable conditions are present within the deposits that enable long-term preservation in situ. This has been challenged by other members of the AP. Although measures have been periodically built into the monitoring regime to refine data gathering and interpretation, these enhancements have not convinced the AP that suitable preservation conditions exist at the site.
- 4.5 Monitoring data between 2012 and the end of 2013 indicated that dry periods prevailed at the site.
- 4.6 Hydrological change within the sequence, the presence of soft ancient river deposits and vehicular vibrations on the unengineered haul road, combined with its weight, caused repeated collapse of the southern pit edge in the area of the TPS.

- 4.7 The weight of ponded water from numerous sources (including an Anglian Water mains pipe leak), and several old pipe trenches cut through the TPS and elsewhere along the southern pit edge, have created instability in this localised area contributing to further collapse and an ingress of oxidative water.
- 4.8 A slip of the pit edge occurred near the TPS in February 2014 following which Hanson have suspended use of the haul road (now re-located elsewhere) and re-graded the quarry edge to form a more stable, 1:3 slope. The following combination of factors are believed to have led to the rotational failure of the quarry edge:
- ☐ the excess weight of the haul road, the brick bat surface and the bund;
 - ☐ the angle of the slope and the positive pore water pressures generated by the very high (perched) water in the area of the TPS; and
 - ☐ water entering and expanding surface cracks.

5.0 INDEPENDENT ADVICE

- 5.1 Because there was cause for concern in 2013 the MPA commissioned hydrological monitoring specialists from the National Museum of Denmark to review the hydrological monitoring data from the TPS monitoring programme and the associated interim monitoring reports produced on behalf of Hanson. The opinion, entitled *Independent opinion on the results of a hydrological and geochemical monitoring programme for the timber platform site, Must Farm Quarry*, was published on 8th February 2013 and was shared with Hanson and their specialists, English Heritage and the AP. The report concluded that:
- The preservation conditions in the occupation zone in the period 2008-11 were not conducive to the preservation of organic archaeological remains due to a low water level and low water content of the soil. Conditions improved in 2012 but it was likely that some degradation continued as oxidized species in the soil had accumulated in previous years and/or because sulphate rich water flowing through the site.
 - It was difficult to evaluate if the long term preservation in situ is viable, as the current conditions were not fully evaluated (specialist equipment had not been calibrated to reflect the site specific conditions, despite

requests from the AP to do so) and it was not known how stable they were. If groundwater levels remained [permanently] above the cultural horizon further monitoring would be required to fully evaluate if degradation was taking place and at what rate. However, if groundwater conditions similar to these recorded between 2008 and 2011 occurred again preservation in situ would not be viable.

- Monitoring data between 2012 and the end of 2013 indicated that dry conditions prevailed at the site.

6.0 RE-WETTING STRATEGY

- 6.1 In response to the concerns expressed about the monitoring results and the views of the independent opinion the advice from Hanson's archaeological consultants was that an alternative approach to re-wet the site would provide conditions necessary for the preservation of organic remains in perpetuity. Three versions of a re-wetting strategy have been presented to the MPA since 2011 with the revised strategy (re-wetting and trial excavation) being submitted in May 2013.

7.0 CONSULTATION RESPONSES ON RE-WETTING STRATEGY

- 7.1 Consultations have been undertaken on the submitted re-wetting strategy and the views of stakeholders are summarised below :

- 7.2 **English Heritage**— consider that the monitoring programme has failed to provide confidence that the site has been stabilised to an extent that ensures the future conservation of its significance. Furthermore the data suggest that preservation conditions have deteriorated during the period of monitoring.

They consider that the scheme to re-wet the site and the proposed trial excavation to be inappropriate responses to the evidence provided in the analysis of the monitoring data and the conclusions of the independent opinion.

They are of the view that the results of the monitoring programme already suggest that the immediate excavation of the cultural horizon is required in order to conserve the significance of these deposits.

They do not consider that there is a viable long term preservation solution , since the scheme was put in place in 2007, that can maintain high-water and low contaminant levels. In their view the monitoring programme shows that preservation in situ , as a mitigation strategy which conserves its significance, is

no longer sustainable. Immediate action, through excavation, is needed to prevent further loss of significance.

- 7.3 **County Archaeologist** – concurs with the advice provided by English Heritage (see para 7.2 above) and also has no confidence in the efficacy of the proposed re-wetting strategies on engineering and compaction grounds.
- 7.4 **University of Cambridge, Division of Archaeology** – there is inadequate evidence to suggest that preservation conditions have been enhanced over the monitoring period. Consequently it cannot be demonstrated that the preservation in situ scheme is viable and working.

Concerns expressed about land stability issues from raising the land levels; chemical and source composition of water to be used for re-wetting ;practicality of installing a deep HDPE barrier ; the need for pre-treated water and related sustainability and viability; uncertainties that overturning the oxygen-rich environment in the cultural horizon at the TPS would have any effect since the site has suffered decay since first encountered in 2006; cost of and mechanism for future long term monitoring.

The trial investigation proposed as part of the re-wetting scheme was rejected by the Advisory Panel some years ago for a number of reasons encompassing the subsection of the site to air ingress on an incisive scale; the poorly chosen location to determine the state of preservation; where the site has been already compromised through earlier excavations and occurs outside the area of occupation. The trial excavation is regarded as inappropriate and a waste of resources.

Overall the proposed re-wetting scheme is judged inadequate and cannot guarantee the long term preservation of all the organic components in the Must Farm cultural horizon in a very compromised edge of the quarry. The recommendation from the Division of Archaeology is that the occupation area should now be excavated in its entirety to remove any vulnerability and salvage what remains of a nationally and internationally significant monument.

8.0 PLANNING CONSIDERATIONS

- 8.1 In the consideration of the submitted proposed re-wetting strategy due regard should be taken of the policies within the National Planning Policy Framework (NPPF), notably paragraphs 132,139, 141 and 144. These policies highlight the

need for the MPA to conserve historic assets, safeguard their survival and to record such assets if there is a risk they will be lost.

- 8.2 Policy CS 36 of the adopted Cambridgeshire and Peterborough Minerals and Waste Core Strategy (2011) states that planning permission will not be granted for schemes where there is an adverse impact on any heritage asset of national importance. Approval for mineral extraction may be granted where satisfactory mitigation measures have been agreed. This can involve preservation in situ through appropriate, monitored arrangements where it is possible to do so.
- 8.3 Significant weight should be attached to the views of English Heritage as they are the government's advisers on cultural heritage and have been heavily involved in discussions on this particular site.
- 8.4 It is undeniable that great weight has been given to this heritage asset's conservation since its discovery in 2006, with a mitigation strategy orientated towards the preservation of the site remains. Monitoring data indicates that preserving conditions have not occurred at the since 2007 and owing to the importance of the remains their recovery is now considered to be necessary.
- 8.5 Having regard to the comments made by consultees and in relation to Policy CS 36 it is considered that the proposal to re-wet the archaeological deposits, undertake a trial excavation and instigate a scheme of on-going monitoring and review is not acceptable and should therefore be refused. The site is too important to risk the loss of such rare remains through inappropriate strategies and avoidable operational impacts.

9.0 RECOMMENDATION

- 9.1 It is recommended that the applicants be advised that the proposed revised re-wetting scheme submitted in May 2013 is considered to be contrary to the provisions of Policy CS36 in that the revised scheme of preservation in situ is not considered suitable or appropriate in the circumstances and refused.
- 9.2 It is further recommended that Hanson be advised that they should, within the next three months submit a further revised scheme of archaeological mitigation being a focused strategy to retrieve and record the vulnerable remains of the Late Bronze Age Timber Platform Site at the edge of Old Must Pit, in order to safeguard the remains from further damage or decay.

10.0 NEXT STEPS

- 10.1 In discussions between the MPA, Hanson and English Heritage English Heritage has encouraged Hanson to apply to their National Heritage Protection team for NPPF assistance funding for the excavation of the site (up to 50%), suggesting that an application to them sent early in the New Year would be strongly supported by the Inspector of Ancient Monuments and the Senior

Science Advisor, funding to be arranged and spent within the year. EH and Hanson have had one formal meeting to discuss this, but no decision has yet been made by Hanson regarding uptake of this offer. Hanson is studying the cost difference between an excavation and a re-wetting strategy.

- 10.2 A monitoring review point occurs in mid-June 2014, ahead of which recent acknowledgement by SLR of seasonally dry summer conditions has been made with a request for a temporary re-wetting measure for the TPS. No details as to how this will be achieved have been presented. The MPA, keen to prevent an inappropriate expenditure, will communicate to the applicant just prior to the review point that the proposed re-wetting strategy to safeguard these important remains is unacceptable to the MPA.
- 10.3 It is anticipated that an update report on this matter will be presented to a future Committee meeting in the autumn when progress will be reviewed.

ARCHAEOLOGICAL BACKGROUND

- A.1 A series of ash stakes eroding out of the edge of Old Must Pit were investigated for dating purposes during an evaluation of the Must Farm Quarry application area in 2005 to determine if they were part of the 1960's quarry pit revetment or something more ancient in origin. These were found to date between 1000-800 BC.
- A.2 Two short examination trenches were opened in 2006-7 after the planning determination period wherein the tightly spaced ash stakes were found to form a 40m oval palisade around an older oak piled structure dating to around 1250 BC, built over a channel. The piles had carried an elevated settlement platform and had been the subject of at least one major repair. The structure caught fire around 870BC and its burning timbers and occupation contents rapidly quenched as they fell into the river beneath. 30 complete pots were recovered that contained charred food remains and spoons, while partially charred, nationally rare woven textiles (already the subject of international academic attention), basketry, withies and fragments of rush matting, were found alongside coloured early glass beads and a wide array of bronze tools. Waterlogged and charred grain and legumes, cattle, pig and fish bones denoted the food sources of the inhabitants. Finely woven eel traps and fish weirs were found pegged within the river, while piles with perforated corners suggested tethering places for boats (8 log boats were found 300m upstream in the river in 2011).
- A.3 Similar sites are rare, but those known are from prehistoric Alpine Lake Villages preserved beneath lake silts, and from Japan where they were preserved under earthquake landslides or tsunami deluge deposits. Late Iron Age Glastonbury lake village (excavated in 1897) was constructed, crannog-like, in a mere, while Shinewater (Eastbourne) and Flag Fen (2km to the north) were Late bronze Age/Early Iron Age platforms constructed along trackways across a wetland and a fen embayment with votive offerings of twisted, or 'killed', bronze weaponry at the end points. Flag Fen is not a settlement platform, but is contemporary with the Must Farm Timber Platform Site (TPS). Together with other sites at the fen edge of Peterborough and Whittlesey, they allow the understanding of the character of settlement to be refined in a period of great environmental and climate change.

- A.4 This combination of preserved 3000 year old organic structural timbers and domestic artefacts alongside more typical archaeological objects (pots, bone metal equipment etc) is very rarely found but is able to widen the understanding of prehistoric life in a way that dry land sites cannot do. Consequently the site is classed of national importance and, under current planning policy of the National Planning Policy Framework (2012 para. 139), subject to the same treatment as sites with statutory protection, such as scheduled monuments.