

HyNet North West Hydrogen Pipeline

Delivering clean growth



Appendix 6G

Draft Outline Archaeological Written Scheme of Investigation (OWSI)

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1. Introduction

1.1. Scope

- 1.1.1. This Outline Archaeological Written Scheme of Investigation (OWSI) has been produced to set out the archaeological response to the disturbance of remains resulting from construction of the HyNet North West Hydrogen Pipeline Project ('the Project'). The delivery of the works described in this OWSI will be secured through a DCO Requirement.
- 1.1.2. The OWSI sets out the overarching archaeological mitigation strategy that will be followed before and during construction of the Project. This document is intended to provide an introduction to the Project, archaeological background, and regional research agenda, along with setting out the overarching procedures and standards for archaeological works.
- 1.1.3. Individual site-specific written schemes of archaeological investigation (SSWSIs) applicable to the pre-construction and construction phase works will be produced to describe in detail the measures for individual phases of investigation within defined areas (Sites) within the Draft Order Limits in accordance with this OWSI.
- 1.1.4. Measures are defined on the basis of available desk study and survey information including geophysical survey. Where required to inform the details of mitigation further surveys will be completed post-consent, and SSWSIs will be provided setting out proposals for such survey. SSWSIs will also be produced for mitigation which may be required following completion of evaluation surveys. Development of appropriate mitigation strategies will be undertaken, as appropriate, with input from experienced specialists (e.g., geoarchaeologist and environmental archaeologist). The SSWSIs will be based on the detailed design to be progressed post-consent.
- 1.1.5. An updated version of this OWSI will be submitted with the Final ES.

1.2. Project Roles

- 1.2.1. Project roles relevant to the implementation of this OWSI are set out below. The SSWSIs will set out the project roles and responsibilities in detail for relevant individual works.

The Applicant – Cadent Gas Ltd

- 1.2.2. Cadent Gas Ltd (Cadent) (with their appointed contractors to the roles described in this OWSI) will be responsible for implementing the OWSI (and subsequent SSWSIs). Cadent will ensure that all relevant project personnel understand the archaeological requirements.

Archaeological Clerk of Works (ACoW)

- 1.2.3. The ACoW will be appointed by and act on behalf of Cadent.
- 1.2.4. The ACoW will be suitably qualified and experienced, commensurate with the responsibilities of this role as outlined. All archaeological works will be monitored by the ACoW. The ACoW will ensure, on behalf of Cadent that this OWSI (and subsequent SSWSIs) are implemented, will review any archaeological method statements, sampling/finds policies and reporting, and will lead consultation with Archaeological Curators, as advised by Cadent.. The ACoW will ensure that consultation with Archaeological Curators will be maintained throughout the different stages of archaeological works.
- 1.2.5. The ACoW will report to Cadent and will provide advice to Cadent to inform communication with stakeholders and contractors in relation to the implementation of the OWSI and SSWSIs.

Archaeological Curators

- 1.2.6. The curatorial responsibility for the historic environment of the Project post-consent resides with the relevant Local Planning Authorities (LPA). Archaeological Curators will be provided with copies of all relevant project documentation and will be consulted in all aspects of the historic environment.
- 1.2.7. As required, SSWSIs, reports and deliverables will be submitted to the Archaeological Curators by Cadent Archaeological Curators may attend site visits and/or meetings where requested/required during monitoring of archaeological works.
- 1.2.8. Archaeological fieldwork will require signing off by the relevant Archaeological Curator for each stage of the scheme.

Main Works Contractor

- 1.2.9. The Main Works Contractor will be appointed by Cadent. Where the appointed Main Works Contractor has responsibility for the construction phase of work, any archaeological works undertaken during this phase will be managed by them.
- 1.2.10. The Main Works Contractor will ensure that all relevant project personnel understand the archaeological requirements and will ensure that these are complied with.
- 1.2.11. The Main Works Contractor will inform the ACoW and Archaeological Contractor of any environmental constraints or matter relating to health, safety and welfare of which they are aware that is relevant to the archaeological works.

Archaeological Contractor

- 1.2.12. Archaeological works (carrying out the fieldwork, post-excavation reporting, deposition of the archive and dissemination) will be undertaken by an Archaeological Contractor, appointed by Cadent or the Main Works Contractor. Completion of archaeological works will be under the supervision of the ACoW. The Archaeological Contractor will have appropriate experience and be able to maintain appropriate staffing for the proposed work. The Archaeological Contractor shall be a Registered Organisation of the Chartered Institute for Archaeologists (CIfA) or have equivalent experience and expertise. The Archaeological Contractor shall be responsible for supplying any specialist technical or analytical services required for specific archaeological procedures.
- 1.2.13. Attendance at site visits and meetings will be required by the Archaeological Contractor during the archaeological works, as appropriate, with Cadent, the ACoW, Archaeological Curators and/or Main Works Contractor in attendance.

2. Archaeological and Historic Background

2.1. Chronological Summary

- 2.1.1. The historic and archaeological background of land within the Draft Order Limits has been documented in a Historic Environment Desk-based Assessment (DBA) (Appendix 6A). This document defines the Study Areas used to develop the historic and archaeological background to the Project and assesses levels of archaeological potential and sensitivity from this. To provide context for the chronological summary that follows, the historic environment Study Area covers an area of 1km from the Draft Order Limits.

Prehistoric

Mesolithic to Neolithic

- 2.1.2. Relatively little evidence of early prehistoric activity is recorded within the Study Area. No palaeolithic activity is currently recorded, but Mesolithic and Bronze Age peat layers have been recorded (MCH25132) close to the Draft Order Limits east of the village of Ince in the West Corridor. Other parts of the Draft Order Limits contain similar geological conditions, such as Sink Moss and Partington Moss, both in the East Corridor.
- 2.1.3. Excavations within Helsby Iron Age hillfort have recovered evidence relating to a long occupation of the promontory upon which it sits, with the earliest evidence dating to the Mesolithic period in the form of flint scatters (MCH22371).
- 2.1.4. Evidence of a possible Neolithic stone circle is recorded north-west of Partington in the East Corridor (MGM8959). This location has since been extensively developed.
- 2.1.5. The majority of recorded evidence of human activity in the Mesolithic and Neolithic period across the Draft Order Limits exists in the form of isolated archaeological artefacts recovered from plough soil such as a flint scatter close to Aston (MCH13413).

Bronze Age

- 2.1.6. The earthwork remains of a bowl barrow at Moultonbank Farm (NHLE 1011123) is representative of Bronze Age mortuary activity close to the South Corridor. Further similar low earthworks have been identified on LiDAR LRM imagery between 250 and 700m to the north of the scheduled monument, which may represent further bowl barrows which have largely been ploughed out (LDr_199-204). These are all located beyond the Draft Order Limits.
- 2.1.7. A scheduled earthwork of a bowl barrow occupied agricultural land between Higher Whitley and Lower Whitley in close proximity to the East Corridor (NHLE 1011166), and ring ditches identified as cropmarks are recorded east of Sutton

Hall (MCH8218; MCH8219) are likely to be the remains of Bronze Age round barrows within the West Corridor. Evidence of further features of this type have been identified on LiDAR (LDr_005) and satellite imagery (for example CPm_025; 043; 065) close to these recorded sites.

- 2.1.8. Evidence of Bronze activity has been discovered during excavations of Wilderspool Roman settlement close to the North Corridor, including the remains of a barrow (MCH8617) and a cremation urn (MCH8608). Numerous finds of Bronze Age features and artefacts are recorded in the area of Grappenhall and Thelwall, most of which were identified prior to housing developments.

Iron Age

- 2.1.9. Extensive areas of cropmarks have been recorded within and close to the North Corridor both on the HER and through the research related to the current project. Some of these, such as a large complex immediately west of Whalton Superior (CPm_023; 163; 190), may relate to late prehistoric settlements and field systems.
- 2.1.10. Cropmarks of probable late prehistoric enclosures representing evidence of settlement and land-use have been recorded close to the Draft Order Limits in the East Corridor. These include enclosures at Caldwell Brook (MGM2062; MGM2061) and a cluster of features around Legh Oaks Farm (MCH6927; MCH6698; MCH9346; MCH9347).
- 2.1.11. Cropmarks identified on Google Earth between Sutton Weaver and Aston may relate to late prehistoric field boundaries and trackways (CPm_038; 043; 072; 194; 265), while the Iron Age hillfort at Helsby (NHLE 1013292) stands testament to the hierarchy of settlement in the region during this period.
- 2.1.12. Isolated small finds recovered from plough soil dating to this period are recorded across the Draft Order Limits.

Romano-British

- 2.1.13. The scheduled remains discovered through excavation of a Roman settlement at Wilderspool (NHLE 1006769), south of Warrington, provides extensive evidence for Roman occupation and land-use close to the Draft Order Limits in the North Corridor.
- 2.1.14. Roman roads are present within and close to the Draft Order Limits. These include North Cheshire Ridge Roman Road in the East Corridor (MCH9506) King Street in the South Corridor (MCH8684) and the Chester to Wilderspool Roman Road (MCH1449).
- 2.1.15. Settlement and land-use in the form of cropmarks which could also be late prehistoric in date. Recorded evidence for this is most plentiful in the East, West and North Corridors, but this may be a result of the weight of investigation compared to that within the South Corridor.
- 2.1.16. Despite large-scale evidence for extensive Roman salt working and settlement within the nearby towns of Northwich and Middlewich, relatively little evidence of Roman settlement activity has been recorded across the Study Area, with the exception of Wilderspool. Most recorded heritage assets dating to this period are isolated small finds from across the Study Area.

Early Medieval

- 2.1.17. Relatively little evidence for early medieval activity is recorded within the Study Area, and where known, evidence is sparse and difficult to contextualise in terms of settlement and land-use in the period.
- 2.1.18. Part of cross shaft (MCH1162) found during excavations close to St Mary's Church, Thornton-le-Moors in the West Corridor, is believed to date to the early medieval period. The presence of this find is suggestive of an early medieval church in or close to the present location of the 14th century church.
- 2.1.19. Numerous logboats have been recovered from the historic River Mersey south of Warrington in the North Corridor and East Corridor. These have been variously radiocarbon dated to the 9th to 11th centuries AD and should be seen as indicative of settlement and trade along the River Mersey in this area during the early medieval period.
- 2.1.20. The medieval manor or grange of Ince, the remains of which are a scheduled monument (NHLE 1009635) is thought to have its origins in the early medieval period due to its inclusion in Domesday as a manor or grange belonging to the Church of St Werburgh Abbey, Chester. No physical remains are recorded which could testify to the early origins of the manor.
- 2.1.21. Place names with early medieval name elements are in abundance throughout the Study Area. Many existing settlements which were included in the Domesday Survey of 1086 contain old English place name elements, including Frodsham (*ham*), Higher and Lower Whitley (*ley* or *leah*), and Daresbury (*Bury* or *Burh*).
- 2.1.22. Isolated small finds comprise most of the recorded evidence for early medieval activity across the Study Area. These include pin heads, brooches, harness fittings and lead weights. These are all chance finds and are not in themselves indicative of early medieval settlement or land-use in the area in which they were discovered.

Medieval

- 2.1.23. Villages with medieval origins are scattered across the whole Study Area, many of which are now Conservation Areas. Many contain historic churches with origins in at least the medieval period.
- 2.1.24. Moated sites are commonly found throughout the Study Area, at Elton in the West Corridor (NHLE 1012122), Drakelow Hall in the South Corridor (NHLE), Micklehead in the North Corridor (NHLE 1012329) and Swineyard Hall in the East Corridor (NHLE 1009585). These all survive as earthworks in various states of preservation, with some currently containing water within their moats.
- 2.1.25. The scheduled remains of Vale Royal Abbey in the South Corridor (NHLE) and Monastic Grange at Ince (NHLE 1009635) survive as buried deposits. These are testament to religious and economic organisation during the medieval period, with their demise indicative of the changes which occurred from the 16th century onwards.
- 2.1.26. Existing buildings dating to the medieval period are mostly churches such as the Grade I listed St Mary's at Thornton-le-Moors,

- 2.1.27. Evidence of former medieval field systems in the form of relict furlong boundaries re-used as enclosure boundaries, and a small amount of known evidence for ridge and furrow which survives as either buried or upstanding remains, most notably close to the River Weaver east of Frodsham (LDr_003).
- 2.1.28. Numerous township boundaries are located within the Draft Order Limits, some of which are defined by historic hedgerows which may meet the criteria to be considered important under the Hedgerow Regulations.
- 2.1.29. Isolated small finds discovered in ploughsoil or during archaeological excavations.

Post-medieval

- 2.1.30. Evidence of piecemeal enclosure is abundant throughout the Study Area, evidenced through existing hedgerows which form field boundaries created throughout the post-medieval period. Evidence of Parliamentary Enclosure is also present in numerous areas of the Study Area, characterised by very straight and regular hedgerows which are commonly located on areas of former open moorland or marsh, such as Carrington Moss in the East Corridor, and Ince Marsh in the West Corridor.
- 2.1.31. Industrial development characterises large areas of the Study Area, with plentiful surviving sites standing testament to this. The most tangible are the Bridgewater, Trent and Mersey and Manchester Ship canals, which intersect the Draft Order Limits at various points.
- 2.1.32. Salt working has been practiced in the area since late prehistory, but evidence within the Study Area and its vicinity largely dates to the post medieval period. Substantial industrial development is evidenced within and close to the towns of Northwich, Warrington, Runcorn and St Helens
- 2.1.33. Three Registered Parks and Gardens are located within 1km of the Draft Order Limits: Frodsham (Castle Park) (NHLE 1001622) in the West Corridor, and Arley Hall (NHLE 1000637) and Dunham Massey (NHLE 1000853) in the East Corridor.

Modern

- 2.1.34. World War II gun placements at Sutton Hall (NHLE 1019849) in the West Corridor and close to Penketh (NHLE 1019531) in the North Corridor. These are both scheduled monuments containing upstanding structural remains. Other World War II sites include bombing decoys close to Ince in the West Corridor (MCH9993; MCH9994) and Bostock in the South Corridor (MCH9768), a searchlight battery close at Aston Heath (MCH10617), anti-aircraft battery at Moore in the North Corridor (MCH9854).
- 2.1.35. The site of Fiddler's Ferry Power Station, now demolished, represents the continued industrial development prevalent across the Study Area, but most notably in the North Corridor.

3. Research Context

- 3.1.1. As mitigation by investigation and recording primarily mitigates loss of archaeological significance, it is important to set the results of any archaeological fieldwork into a wider framework for archaeological research and investigation, in order to advance understanding of the historic environment and the lives of human communities in the past.
- 3.1.2. The North West England Regional Research Agenda (NWERRA) was updated in 2020 from the original work undertaken in 2006-2007. It contains numerous overarching questions along with period specific agendas. SSWSIs will provide further detail and set out how the research potential of individual Sites will be realised against the NWERRA. **Table 6G 3.1** sets out how mitigation works for this project will relate to the NWERRA.

Table 6G 3.1 Archaeological research agenda

Anticipated Remains	Mapping to North West Regional Research Framework
Ridge and Furrow and removed Post-medieval boundaries	- LM05: How can we recreate the medieval-land use patterns within townships - LM12: How do we improve our knowledge of the region's various agricultural practices, plant and animal husbandry, and how did these change and develop over time? - Ensure a full range of appropriate archaeological techniques are applied, such as palaeoenvironmental analysis, landscape survey, place name and documentary evidence. - PM10: Where does pre-18th century enclosure survive in the region? - PM15: How well recorded and understood are farming landscapes, field patterns, distributions of buildings and building types? - IND15: How well recorded and understood are farming landscapes and field patterns?
Late-prehistoric/Romano-British settlements and field systems	- PH12: How can we apply more widespread dating for prehistoric sites? - PH23: How can we identify previously unknown prehistoric sites? - PH25: How can we better understand the distribution of prehistoric archaeology across the landscape? - PH35: How can we identify whether there is a settlement hierarchy for prehistoric lowland settlements? - PH37: What is the evidence for new building types in the Iron Age? - R01: How can we refine the dating of Romano-British sites to clarify the period of transition? - R04: What evidence is there for the survival of regional and tribal identities throughout the Roman period? - R18: What were the locations, density, chronology, economy and character of rural settlement sites and patterns? - R20: How can we identify regional types and patterns of distribution, despite low levels of material culture across the region?

Anticipated Remains	Mapping to North West Regional Research Framework
Buried remains of prehistoric mortuary monuments	• PH38: How can re-excavation or new excavation inform our understanding of the constructional sequence and chronology of Prehistoric funerary monuments? • PH39: How can advances in scientific dating techniques be used to enhance our understanding of Bronze Age funerary practices? • PH42: How can an inter-regional study of the distribution of monument complexes help us to understand Neolithic and Bronze Age monuments in a wider landscape context?
Remains of structures relating to former industrial use including salt works	• PM27: How do the industries associated with the North West evolve and develop during this period? • PM29: How do the extractive industries develop during this period?
Artefacts and ecofacts within peat layers	• PH02: How effective has the North West Wetlands Survey been as a planning tool? • PH04: How can we enhance existing datasets for Prehistory in the region? • PH13: Where there are sealed secure groups of microliths, how can we obtain relative radiocarbon date associations? • PH17: How can a programme of sampling and investigation help to characterise landscape use of the wetlands during the prehistoric period? • PH18: What can palaeoenvironmental analysis of buried soils tell us about prehistoric environments? • PH19: How can we best capture data for the palaeoenvironment in prehistory?

4. Development Impacts and Archaeological Response

- 4.1.1. Any works which disturb the ground, such as groundworks associated with construction of the pipeline and associated infrastructure such as Hydrogen Above Ground Installations (HAGIs) and Block Valve Installations (BVIs) have potential to damage or destroy archaeological features, structures and deposits that may be present. Archaeology is a non-renewable resource. Where impacts cannot be avoided through exclusion from the project area or design modification, a programme of archaeological works (appropriate to the significance of the archaeological remains) is required to mitigate impact through thorough investigation and recording of the archaeology that will be damaged or destroyed.
- 4.1.2. Desk-based research as set out in the DBA (**Appendix 6A**) has established that the land affected by the Project has archaeological potential, indicated by data held by the HERs for Cheshire, Merseyside and Greater Manchester, and from analysis of historic mapping, LiDAR and aerial and satellite imagery; and through geophysical survey (**Appendix 6E**) and geoarchaeological desk-based research (**Appendix 6F**).
- 4.1.3. For each area of land affected by the development, evaluation of the archaeological potential will be undertaken to establish the presence or absence, and character and significance of archaeological remains.
- 4.1.4. The principal investigation methods to undertake this evaluation phase are:
- Evaluation trenching
 - Rapid Identification Earthwork Survey
- 4.1.5. The results of the archaeological evaluations will inform a programme of archaeological mitigation. The purpose of which is to construct a detailed record of the archaeological remains that will be lost or damaged as a result of the Project. The principal investigation methods to undertake this mitigation phase are:
- Archaeological monitoring
 - Strip, map and sample excavation
- 4.1.6. The mitigation method used for each area of archaeological interest will reflect the archaeological potential identified at evaluation and the level of impact. The type of investigation initiated may change if significant archaeological remains are identified during the mitigation works which were not indicated at evaluation. For example, Archaeological Monitoring may be upgraded to Strip Map and Sample if important archaeological sites or features are identified at this stage.
- 4.1.7. The detail of evaluation and mitigation proposals, including the most appropriate methodology, and the exact extent of any intervention, will be agreed with the relevant Archaeological Curators (for Cheshire, Merseyside or Greater Manchester), and will be set out within the SSWSIs.

5. Archaeological Response

5.1. General Principles

Aims

- 5.1.1. Archaeology is a non-renewable resource. Where impacts cannot be avoided through exclusion from the project area or during detailed design, a programme of archaeological works (appropriate to the significance of the archaeological remains) is required to mitigate impact through thorough investigation and recording of the archaeology that will be damaged or lost during construction of the Project.
- 5.1.2. Archaeological work is intended to:
- Mitigate loss of archaeological interest of at-risk heritage assets; and
 - Inform planning of non-archaeological (i.e avoidance and design) mitigation.

Objectives

- 5.1.3. All archaeological mitigation will be proportionate to the significance and extent of the potential effects on archaeological remains and will be designed to address the specific research agenda set out in **Section 3**.
- 5.1.4. The objectives of the archaeological evaluation and mitigation strategy are to:
- identify archaeological remains (extent, condition, character, and significance) which may be disturbed by the Project;
 - where reasonably practicable, ensure that such remains are appropriately protected from disturbance during works (preservation through avoidance);
 - ensure that any remains which are disturbed are appropriately investigated and recorded (preservation by record);
 - carry out appropriate post-excavation analysis to allow site records and analysis of archaeological material to be synthesised into an appropriate interpretative report; and
 - disseminate the findings of the archaeological investigations at a level commensurate with their significance.

Standards

- 5.1.5. The following professional standards apply:

- Chartered Institute for Archaeologists 2020 Standards and Guidance for Archaeological Excavation;¹
- Chartered Institute for Archaeologists 2020 Guidelines for the Collection, Documentation, Conservation and Research of Archaeological Materials;²
- Chartered Institute for Archaeologists 2022 Code of Conduct;³

5.2. Proposed Methodology and Application

5.2.1. This section provides an overview of the proposed evaluation and mitigation strategy to be used in developing the SSWSIs established in response to meeting the aims and objectives in **Section 5.1**. The proposed application of each method is described in **Section 5.3**, whilst the professional standards by which all archaeological work will be undertaken are listed for each method or activity within **Section 5.4: Standards for archaeological work**. The work outlined by this OWSI relate to works within the Draft Order Limits, and to works that take place prior to, during and after construction.

Evaluation Phase

- 5.2.2. Targeted further evaluation will be undertaken prior to construction in selected areas identified as anomalies in the geophysical survey and features identified from analysis of aerial photographs and LiDAR, as well as other areas of high archaeological potential identified in the DBA (**Appendix 6A**) or high geoarchaeological potential (**Appendix 6F**).
- 5.2.3. The principal investigation methods to undertake this evaluation phase are:
- evaluation trenching;
 - geoarchaeological investigations; and
 - geoarchaeological monitoring of ground investigation works, where required.
- 5.2.4. Where relevant, the evaluation phase will inform the development of archaeological mitigation (avoidance by design or preservation by record).

¹Chartered Institute for Archaeologists (2020) Standards for Archaeological Excavation. (Online). Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GExcavation_2.pdf (Accessed July 2024)

² Chartered Institute for Archaeologists (2020) Guidelines for the Collection, Documentation, Conservation and Research of Archaeological Materials. (Online). Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26G Finds_2.pdf (Accessed July 2024)

³ Chartered Institute for Archaeologists (2022) Code of Conduct. (Online) Available at: <https://www.archaeologists.net/sites/default/files/Code%20of%20conduct%20revOct2022.pdf> (Accessed July 2024)

Mitigation phase

- 5.2.5. All archaeological mitigation will be proportionate to the significance and extent of the potential effects on archaeological remains and will be designed to address the specific research agenda set out at **Section 3: Research context**.
- 5.2.6. The results of the archaeological investigations in the evaluation phase will inform a programme of archaeological mitigation..
- 5.2.7. The need for, feasibility, location, extent and methodology of any additional non-intrusive surveys will be agreed with the Archaeological Curators and will be set out within the SSWSIs.

Preservation by record

- 5.2.8. Where archaeological remains will be lost or damaged as a result of the Project, these will preserve by record. The principal investigation methods to undertake this mitigation phase are:
- Archaeological Monitoring (watching brief)
 - Strip, Map and Sample
 - Set Piece Excavation;
 - Geoarchaeological monitoring and investigation; and
 - Recording of Historic Boundaries
- 5.2.9. The mitigation method used for each area of archaeological interest will reflect the archaeological potential identified at evaluation and the level of impact. The type of investigation initiated may change if significant archaeological remains, not indicated at evaluation, are identified during the mitigation works, e.g., Archaeological Monitoring may be upgraded to Set Piece Excavation, if important archaeological sites or features are identified.
- 5.2.10. The detail of evaluation and mitigation proposals, including the most appropriate methodology, and the exact extent of any intervention will be agreed with the relevant Archaeological Curators, and will be set out within the SSWSIs. Any amendments which may be required to SSWSIs will need to be agreed with the relevant Archaeological Curators.

5.3. Evaluation and Mitigation Techniques

Evaluation Trenching

- 5.3.1. The objective of trial trench evaluation as defined by the ClfA is to '*determine and report on, as far as is reasonably possible, the nature of the archaeological resource within a specified area using appropriate methods and practices*' (Ref.). The results of the evaluation will inform an appropriate mitigation strategy for any archaeological remains, if required.

- 5.3.2. Trial trenching will be carried out in areas to be identified as outlined in **Section 5.2**. Proposed trench locations will be set out in a plan to be included in an updated OWSI to be submitted with the Final ES. The detailed location and extent of evaluation trenching will be proportionate to the potential and significance of the archaeological interests and will be determined on the basis of desk study and survey information and in consultation with the Archaeological Curator(s).
- 5.3.3. Evaluation trenching will comprise the excavation of a sample of the area to be affected by construction of the Project, to be agreed on a Site-by-Site basis, typically using 30m or 50m by 2m trenches unless otherwise agreed with the relevant Archaeological Curator for each stage of the scheme. Any sampling strategy will have regard to the results of geophysical survey or walkover and to the extent of prior disturbance.
- 5.3.4. In evaluation trenching, there is the presumption of the need to cause minimal disturbance to the Site; and that significant archaeological features (e.g. building slots or postholes) should be preserved intact even if fills are sampled.
- For linear features, 1m wide slots (min.) should be excavated across their width.
 - For discreet features (eg pits or postholes), 50% of their fills should be sampled.
 - Any natural subsoil surface revealed should be hand cleaned and examined for archaeological deposits and artefacts. Sample excavation of any archaeological features revealed may be necessary to gauge their date and character, and to determine whether earlier features are sealed by these deposits.
- 5.3.5. Human remains will be left in situ during evaluation work, unless considered at risk or there is value in lifting the human remains to guide future mitigation.
- 5.3.6. Metal detecting will be conducted during evaluation trenching by a named and experienced detectorist under archaeological supervision, before trenches are opened, during the excavation of features within the trenches, and of the spoil.

Archaeological Monitoring (Watching Brief)

- 5.3.7. Archaeological monitoring (watching brief) will be used:
- To provide opportunities for archaeological investigation and recording in circumstances where investigation would otherwise be impractical;
 - where archaeological remains of limited value or extent are suspected within a working area; and
 - it will comprise an archaeologist being present, either continuously or on an agreed schedule of inspection-based visits, during intrusive groundworks so that the presence, or absence, of archaeological remains can be confirmed, and any such remains can be appropriately recorded.

- 5.3.8. The risk that archaeological remains might be present will be well established on the basis of previous stages of evaluation and/or mitigation works, and the areas identified within the SSWSIs. Any site-specific requirements will be set out in the individual SSWSIs.
- 5.3.9. The need to monitor construction works will be predictable, and appropriate arrangements for Archaeological Curator inspection visits will be acceptable in most instances.
- 5.3.10. Where archaeological deposits are encountered, sufficient excavation will take place to allow appropriate records to be compiled, as might be reasonably achieved. Provision will be allowed for access in keeping with health and safety considerations.
- 5.3.11. Should extensive and/or important or well preserved archaeological remains be found which cannot be addressed within the scope of a watching brief, the requirements for any further excavation will be discussed with the client and relevant Archaeological Curator.
- 5.3.12. Archaeological monitoring and recording will be undertaken to the standards set out at **Section 5.4**.

Strip, Map, Sample

- 5.3.13. Strip, map and sample mitigation will be undertaken to identify specific archaeological foci within an extensive area of potential, or to expose the spatial characteristics of extensive archaeological landscape elements, such as field systems, prior to selecting locations for targeted sample excavation. The work is to be undertaken within a framework of evidence-based research objectives.
- 5.3.14. Following initial machine overburden strip, which will be directed and monitored by the Archaeological Contractor, the area should be examined, and a plan of identified and potential archaeological features and deposits prepared at an appropriate scale. This will inform proposals for sample excavation, to be agreed with the relevant Archaeological Curator.
- 5.3.15. Where necessary to allow construction works to continue, the release of a part of an area may be agreed with the relevant Archaeological Curator once and appropriate agreed level of investigation has been completed. In this situation, areas which have not been released will be clearly demarcated.
- 5.3.16. Key stages in strip, map, and sample are:
- Careful overburden strip of topsoil and subsoil, using a back-acting excavator, to the uppermost deposit which may contain archaeological features;
 - Immediate planning/mapping of the area while the uncovered surface is fresh and un-weathered. The area should be subsequently checked to see if weathering reveals further features and if so, the plan should be updated; and
 - Sampling, concentrating on establishing a relative chronology through investigations of feature intersections, and by attempting to establish more precise chronologies.

- 5.3.17. Areas for strip, map, and sample will be identified following geophysical survey and/or evaluation trenching and will be agreed with the relevant Archaeological Curator. Individual areas and the justification for their selection will be set out within the individual SSWSIs.
- 5.3.18. Following the planning stage, an appropriate sample of identified features will be investigated. Key areas and nodes will be investigated in sufficient detail to understand them both in respect of their individual characteristics and in relation to their surroundings. This work will focus on adding to the spatial, chronological, functional and environmental context of the investigated area, drawing on the standards set out in **Section 5.4**. Any Site-specific variations will be set out within the individual SSWSIs and/or agreed with the relevant Archaeological Curator.
- 5.3.19. This requirement to sample and record identified features will be continually monitored during fieldwork and amended according to its effectiveness in meeting research objectives. Consideration of strip, map and sample operations will be discussed with the relevant Archaeological Curator, with a view to extending these operations where significant archaeological remains have been observed, or scaling back operations where the potential presence of archaeological features is demonstrably low, based the following criteria:
- Identified prior truncation/disturbance;
 - Absence of observed features; or
 - Confirmation of prior survey results which suggest poor survival of archaeological features.
- 5.3.20. Any decision to scale back the scope of strip, map and sample mitigation will be undertaken only after agreement with the relevant Archaeological Curator has been confirmed and this will be recorded in an amended SSWI.
- 5.3.21. Following completion of archaeological investigation to the satisfaction of the relevant Archaeological Curator, the relevant area, or agreed parts thereof, will be released to the Main Works Contractor to enable construction works to proceed.

Set Piece Excavation

- 5.3.22. Set-piece excavation will be undertaken where evaluation has identified the extent and character of significant archaeological remains, allowing for a definitive investigation area, sampling and finds recovery policy to be defined.
- 5.3.23. The individual defined areas identified for set-piece excavation will be set out in the individual SSWSI. This will include provision to extend areas if important archaeology continues beyond the defined extent.
- 5.3.24. Set-piece excavation and recording will be undertaken to the standards set out at **Section 5.4**. Any site-specific sampling requirements will be set out within the individual SSWSIs.

Geoarchaeological monitoring and investigation

- 5.3.25. Geoarchaeological mitigation, comprising further boreholes and/or test pitting will be undertaken prior to construction within areas of high geoarchaeological potential identified within the Geoarchaeological Desk-Based Assessment (**Appendix 6F**). This will include peat deposits (mosses) and alluvial deposits with potential for buried land surfaces.
- 5.3.26. Proposed areas of geoarchaeological mitigation will be set out in a plan to be included in an updated OWSI to be submitted with the Final ES.

Recording of Historic Boundaries

- 5.3.27. Historic township and parish boundaries will be recorded in cross-section to ensure there is a record of these historic boundaries.
- 5.3.28. Boundaries will be recorded by the Archaeological Contractor, and will include a description, digital photographs and measured profiles with the alignment, extent and location plotted onto an OS map base. A 360° machine fitted with a toothless ditching bucket will be deployed to cut a section through historic boundaries to enable a section to be recorded by drawing and photograph. If boundaries are sufficiently substantial a 360° machine will be deployed to remove overburden so as to recover buried soils for appropriate analysis. Each location will then be assessed for archaeological features. Should archaeological features be identified a record will be made of these to the standards set out at **Section 5.4**.
- 5.3.29. The location of all historic boundaries, together with a description of the element of the Project with which they would intersect, are listed in **Table 6G 5.1**.

Table 6G 5.1 Historic Boundaries

Boundary	Project element	Physical character	Estimated date	Corridor	Easting	Northing
Elton- Thornton le Moors	Access	Water course, but defined as a footpath on OS	Ancient	West	346181	376366
Ince-Frodsham Lordship	Access	Water course (Hoolpool Gutter)	Ancient	West	347619	376818
Clifton- Sutton	Pipeline (WP3/WP4)	Water course (Flood Brook)	Ancient	West	352852	379024
Sutton- Aston	Pipeline (WP3)	Field boundary/former water course (hedge)	Post Medieval	West	355160	378903
Aston Grange-Dutton Park	Pipeline (WP3)/ Access	Field Boundary	Post Medieval	West	357310	377498
Bostock- Moulton	Pipeline (SP2)/access	Road (Jack Lane)	Post Medieval/Modern	South	366288	368921
Moulton-Eaton	Pipeline (SP3)	Field boundary (bank)	Ancient/Post Medieval	South	364984	369747
Eaton-Hartford	Pipeline (SP1)/access	Water course (River Weaver) and hedgerow	Ancient/Post Medieval	South	364265	370708
Weaverham-Whitegate	Access	Road (Station Road)	Post Medieval	South	360623	374340

Boundary	Project element	Physical character	Estimated date	Corridor	Easting	Northing
Whitegate-Acton	Pipeline/access	Field boundary (hedge/bank)	Ancient/Post Medieval/Modern	South	360475	374092
Acton-Little Legh	Pipeline (SP2)Access	Water course (River Weaver)	Ancient	South	359710	376192
Little Legh-Bartington	Pipeline (SP2)/Access/crossing compound	Water course (River Weaver)/hedgerow	Ancient/post medieval	East	359872	376246
Carrington-Partington	Partington HAGI	Former field boundary, now road within industrial area (original context removed)	Modern	East	372873	391629
Carrington-Dunham Massey	Pipeline/Access	Water course	Ancient	East	373020	390506
Dunham Massey-Warburton	Pipeline/Access	Water course	Ancient	East	372058	388190
Dunham Massey-Warburton	Pipeline/Access	Water course (River Bollin)	Ancient	East	371716	387936
Agden-Lymm	Pipeline	Field boundary (bank, ditch)	Post-medieval	East	371742	387692
Agden-Lymm	Pipeline	Track	Post-medieval	East	371762	387000
Agden-Lymm	Pipeline	Former field boundary (no trace extant)	19th century	East	371692	386764

Boundary	Project element	Physical character	Estimated date	Corridor	Easting	Northing
Agden (later agreement)	Material storage area/crossing compound	Former field boundary (low bank)	Post-medieval	East	371427	386382
Agden (later agreement)	Pipeline/Access	Field boundary (ditch/hedgerow)	Post-medieval	East	371608	386237
Agden-High Legh	Pipeline/Access	Road (Agden Lane)	Post-medieval	East	371063	385448
High Legh-Crowley	Pipeline/crossing compound/Access	Water course (Crowley Brook)	Ancient	East	367506	382729
Crowley-Antrobus	Pipeline/Access	Field boundary (hedge/ditch), partially removed	Post-medieval	East	365394	381220
Antrobus-Higher Whitley	Pipeline/Access/crossing compound	Road (A559 Northwich Road)	Post-medieval	East	363441	380066
Higher Whitley-Lower Whitley	Pipeline/Access	Field boundary (bank and hedgerow)	Post-medieval	East	361859	379295
Lower Whitley-Dutton	Pipeline/Access/crossing compound	Water course (Whitley Brook)	Ancient	East	360858	378355
Sutton-Rainhill	Pipeline (HWH2)/Access	Water course	Ancient	North	350185	391252
Sutton-Rainhill	Access	Water course	Ancient	North	350440	391216
Rainhill-Bold Heath	Crossing compound	Former field boundary (nothing visible)	Post-medieval	North	351265	390152

Boundary	Project element	Physical character	Estimated date	Corridor	Easting	Northing
Rainhill-Bold Heath	Clock Face HAGI construction Compound	Former field boundary (low earthwork bank)	Post-medieval	North	351181	390009
Bold Heath-Cuerdley	Pipeline (HWH2)/Access/Material storage area	Field boundary (hedgerow, possible bank)	Post-medieval	North	354650	387587
Norton-Moore	Pipeline (HWH2)/Access	Field boundary (hedgerow, ditch, possible bank)	Post-medieval	North	356968	385833
Moore-Acton Grange	Pipeline (dark blue)/Access	Former field boundary (hedgerow) (removed to the north through extensive modern disturbance)	Post-medieval	North	358096	385919
Moore-Acton Grange	Access	Modern road	Modern	North	358128	385575
Acton Grange-Walton Inferior	Pipeline (WSp1)/Access	Former Water course now completely disturbed	Modern	North	359335	386170
Acton Grange-Walton Inferior	Pipeline (Solvay)/Access	Former Water course now completely disturbed	Modern	North	359402	385868
Latchford-Grappenhall	Pipeline (WSP1)/Access	Modern road (Clearwater Quays)	Modern	North	363321	387204
Hatton-Newton by Daresbury	Pipeline/Access	Field boundary (hedgerow)	Post-medieval	North	359013	381547

Boundary	Project element	Physical character	Estimated date	Corridor	Easting	Northing
Hatton-Newton by Daresbury	Pipeline/Access/Crossing Compound	Undefined- possible former field boundary (no traces remain)	Post-medieval	North	359349	381622
Preston on the Hill- Dutton	Pipeline/Access	Field boundary (former water course) (hedgerow/bank)	Post-medieval	North	358841	380187
Dutton-Bartington	Pipeline/Access/Material storage area	Water course (Dean Brook)	Ancient	North	360116	377709
Whitegate-Weaverham	Pipeline/Access/crossing compound	Former boundary (ditch)	Post-medieval	south	360329	372822
Weaverham-Whitegate	Pipeline/crossing compound (SBV1)	Former boundary (completely removed)	Post-medieval	south	361656	371146
Bostock-Whatcroft	Pipeline (SP2)/Access	Water course (River Dean)	Ancient	south	367762	369368
Rudheath-Whatcroft	Pipeline (SP2)/crossing compound	Road (King Street Roman Road)	Ancient	south	369388	370076
Elton-Helsby	Pipeline (WP1)/Access	Water course (Hornsmill Brook)	Ancient	west	347801	375753
Helsby-Frodsham Lordship	Pipeline (WP1)	Field boundary (hedge/bank)	Post-medieval	west	349440	377238
Frodsham Lordship-Frodsham	Pipeline (WP1)/Access	Road (Lordship Lane)	Post-medieval	west	350220	377571

Boundary	Project element	Physical character	Estimated date	Corridor	Easting	Northing
Frodsham-Frodsham Lordship	Pipeline (WP1)/Access	Road (Lordship Lane)	Post-medieval	west	351044	378027
Frodsham-Frodsham Lordship	Pipeline (WP1)/Access	Field boundary/drain (bank/ditch)	19th century	west	351312	378217
Aston by Sutton-Aston Grange	Pipeline (WP3)/Access	Field boundary/footpath (hedge/bank)	Post-medieval	west	356261	378467
Acton-Dutton Park	Pipeline (WP3)/Access	Water course (former route of River Weaver)	Ancient	west	358274	377413
Acton-Dutton	Pipeline (WP3)/Access	former water course (channel low depression)	Ancient	west	358801	377280
Frodsham-Clifton	Pipeline (RSp1)	Water course (River Weaver)	Ancient	west	352484	379144
Frodsham-Clifton	Pipeline (WP1)	Water Course	Ancient	west	352500	379132

5.4. Standards for Archaeological Work

- 5.4.1. A parish code number will be obtained from the relevant county HER in advance of each phase of the works, and a unique site code will be assigned as agreed with the relevant Archaeological Curator. All elements of the Site Archive, including finds, samples, plans, photographs and excavation paperwork will be marked with this number. It will be printed on the cover of all reports and used as the accession number of deposition of the archive.

Machine overburden strip

- 5.4.2. For all areas identified as requiring intrusive archaeological work in SSWSIs, removal of topsoil or overburden to the first significant archaeological horizon will be undertaken by a back-acting excavator fitted with a wide (1.8m or 2m) toothless ditching bucket, under the continuous supervision of the Archaeological Contractor with the authority to halt and direct machine excavation.
- 5.4.3. Spoil will be temporarily stockpiled on-site at an identified location, at a safe distance from the stripped areas, and other archaeological constraints, to the satisfaction of the Main Works Contractor. Topsoil, subsoil, and archaeological deposits should be kept separate during excavation to allow for subsequent backfilling of the excavated area. Topsoil should be examined for archaeological material.
- 5.4.4. Areas stripped for, or under, archaeological investigation must be clearly marked and identified to the Main Works Contractor, so that the area is not tracked over, or otherwise disturbed, until the area is clear of archaeological remains. The Archaeological Contractor will confirm to the contractors when an area has been released from archaeological control, and vehicle can track over the specified area.
- 5.4.5. The first significant archaeological horizon, and all subsequent archaeological deposits, will be cleaned by hand. Excavation of any archaeological deposits identified will proceed by hand to the standards set out below, unless agreed with the relevant Archaeological Curator or to any site-specific requirements set out in the individual SSWSIs. If colluvial or alluvial deposits are identified sealing earlier archaeological horizons, the potential for machine stripping of these deposits will be discussed with the relevant Archaeological Curator, once any archaeological features cutting them have been fully excavated and recorded, and it has been established that these deposits are otherwise archaeologically sterile.
- 5.4.6. Following completion of archaeological investigation to the satisfaction of the relevant Archaeological Curator and the Main Works Contractor, each trench or excavation area will be backfilled with the spoil and compacted by machine to level the fill, unless otherwise instructed by the Main Works Contractor.

Hand excavation

- 5.4.7. There is the presumption that excavation of all archaeological deposits will be done by hand unless it can be shown there will not be a loss of evidence by using a machine.

- 5.4.8. Archaeological features will be hand cleaned prior to excavation, to provide accurate definitions. For linear features, such hand cleaning will be targeted at sample excavation points. Deposits interpreted as natural subsoil should be tested by hand, or machine excavation to determine the validity of this interpretation. Where features are interpreted as natural (e.g. tree throws), a percentage of these features, agreed with the relevant Archaeological Curator, will be hand excavated to establish the accuracy of the interpretation.

Excavation

- 5.4.9. Features will be excavated according to the following sampling strategy:

- Features which are, or could be, interpreted as structural must be fully excavated.
- Post holes and pits must be examined in section. Full excavation may be appropriate for specific problem solving, complex depositional sequences and finds recovery. Full excavation may also be appropriate if pits or postholes are small.
- Fabricated surfaces (e.g. yards and floors) must be fully exposed and cleaned, and representative sections excavated, to determine their construction and whether they seal earlier deposits. Where earlier features are suspected of underlying surfaces, the surface will be hand-lifted once it has been fully recorded. The collection of spatially distinct samples will be considered to investigate the use/function of an area and if different activity zones can be identified.
- All burial deposits and associated remains will be subject to 100% excavation and recorded in accordance with an agreed methodology. Spatially distinct samples from the head, torso and feet will be taken in accordance with guidance (Historic England 2018) and may require a licence from the Ministry of Justice.
- Other features must be sufficiently examined to establish, where possible, their date and function. In general: 50% of the representative non-structural linear cut features; and 10% of the fills of substantial linear features (e.g. ditches) in order to establish the feature's character, date and morphology and to provide information on activities taking place in close proximity to the feature. These samples may be varied with the agreement of the relevant Archaeological Curator to reflect specific site conditions observed during excavation.
- Any stratified layers should be subject to hand excavation in 2.5m or 1.0m systematic and gridded squares based on the complexity and extent of the layers. The details of which will be agreed with the relevant Archaeological Curator and set out within SSWSIs where required.
- Where complex sequences are observed during the excavation, an amended excavation strategy will be agreed with the relevant Archaeological Curator.

- 5.4.10. The sampling excavation strategy will be reviewed continuously throughout the course of fieldwork and, if necessary, amended to take account of changing circumstances and understanding. Any changes or amendments will be agreed in advance of implementation with the relevant Archaeological Curator and confirmed in writing. For any complex remains, a sampling strategy will be discussed and agreed with the relevant Archaeological Curator.
- 5.4.11. Where insufficient dating material or information has been retrieved from a partially sectioned feature, further sampling may be undertaken, subject to consideration of residuality, or other factors that might limit the integrity of archaeological data, with reference to the research objectives, and in consultation and agreement with the relevant Archaeological Curator. This may include bulk or column sampling for scientific dating, and/or environmental analysis (e.g. grain or faunal species) which may provide broad dates.
- 5.4.12. Guidelines for developing Site-specific sampling strategies will be set out in the individual SSWSIs. The sampling strategy will be kept under review during the excavation work, and will consider the following:
- A robust spatial framework of excavation to provide an understanding of the distribution of past activities across the investigated area. This will include any 'special' deposits and any patterning in artefact distribution. Such a framework will consider the inter-relationships of major features.
 - The investigation of the intersections of features of archaeological fate to obtain a phasing of the Site.
 - Structural remains and other areas of significant and specific activity (domestic, industrial, religious, hearths, 'special'/patterned deposits etc.) will be excavated and recorded to a degree whereby their extent, date, form and function, and relationship to other features and deposits can be established.
- 5.4.13. Metal detector searches must take place during excavation, including the scanning of areas before they are stripped. Detecting must be undertaken by named, experienced metal detector users, with the SSWSI including reference to their relevant experience. This must be done under archaeological supervision. Detecting equipment should be high specification.

Survey

- 5.4.14. Surveying will be undertaken using a survey-grade GPS (e.g. Leica CS20/GS08 or Leica 1200).
- 5.4.15. The Site grid will be accurately tied into the OS National Grid and located on the 1:2500 or 1:1250 map of the area. Elevations will be levelled to the Ordnance Datum.

Recording

- 5.4.16. A full and proper record (written, graphic and photographic, as appropriate) will be made for all work. A register of all trenches, features, photographs, survey levels, small finds and human remains will be retained.

5.4.17. Unique context numbers will be issued for all features, layers and deposits. Each will be individually documented on a context sheet and drawn in section and plan.

- Plans of any archaeological features on site are to be drawn at 1:20 or 1:50 depending on the complexity of the feature being recorded.
- Sections should be drawn at 1:10, or 1:20 depending on the complexity of the feature being recorded.
- All levels should relate to Ordnance Datum.
- A photographic record of the work will comprise digital images (minimum file size of 6MP) taken on a high-resolution digital camera.
- Photographs will include general site shots and photographs of specific features. Photographs will include a scale, north arrow, site code and feature number (where relevant), and will be listed on the photograph register.

Environmental sampling

5.4.18. The on-site sampling policy will be inclusive, as the significance of individual features may not be fully understood, until wider patterns of spatial distribution and phasing are understood. As set out in the general methods above, arrangements for the processing of bulk samples taken for the recovery of environmental materials should be confirmed. The minimum bulk sample size will normally be 40 litres or 100% of the deposit if the deposit does not amount to 40l, though the final sampling and discard policy for individual Sites will be agreed in consultation with the Project environmental specialist, the relevant Archaeological Curator, and the Regional Scientific Advisor, and set out within the SSWSI. Processing of samples should be undertaken while evaluation excavations are being undertaken in order that information can be fed back and inform the ongoing strategy.

5.4.19. Archaeological deposits will be sampled systematically in bulk samples. All samples will be collected from the fills of cut features, and from any other securely stratified deposits that have the potential to provide environmental or economic information, such as occupation layers or material accumulating on use surfaces. Particular emphasis will be placed on contexts that may supply material suitable for scientific dating of potential early medieval and prehistoric features. Decisions on sampling must also take account of stratigraphic factors, and consider the opportunity to employ chronological, and spatial controls, in the recovery of samples in order to generate environmental information of sufficient quality to meet the research objectives.

- 5.4.20. Provision will be made for column and other appropriate samples to be taken for geoarchaeological assessment, and analysis as appropriate and in line with technical guidance including Historic England guidance.⁴ Due consideration will be given to the collection of samples suitable for microfossil analysis, and other specialised analysis from suitable deposit sequences, that might inform the pattern of changing environmental conditions over time. Waterlogged and cess deposits will be specifically sampled for microfaunal and invertebrate analysis. Bulk samples will also be taken from any waterlogged deposits present for assessment of organic remains. Any organic artefacts that are retrieved during the excavation will be stored in appropriate conditions and assessed by a qualified archaeological conservator.
- 5.4.21. Industrial residues and waste from craft, and manufacturing processes will also be routinely sampled in line with guidance provided by Historic England.⁵
- 5.4.22. If required, a detailed site-specific sampling policy in line with regional and national guidance will be set out in the individual SSWSI in consultation with the Historic England Regional Advisor for Archaeological Science (North West England). This will detail specific categories of material that are of interest for the individual Sites and identify a programme of work to support the research objectives. Revised as appropriate throughout the excavation and post-excavation phases.

Artefact recovery and conservation

- 5.4.23. The recovery of material that can adequately date major archaeological phases is a key requirement. It is recognised that the incidence of artefacts may limit the quality of datable assemblages, and measures for scientific dating are also set out below. However, artefacts remain a key source of dating information.
- 5.4.24. All finds will be collected and processed unless variations are agreed with the relevant Archaeological Curator during the excavation.
- 5.4.25. Ceramic finds should be processed, and initial assessment undertaken for dating and significance, concurrently with the excavation, to allow immediate assessment and input into decision-making.
- 5.4.26. Bulk finds such as pottery and animal bone will normally be collected by context. Where it is appropriate, and following additional instruction, enhanced recovery techniques and sampling strategies for the recovery, and recording of waterlogged wood and timber, will be set out in respect of specific Sites in the individual SSWSIs as appropriate.

⁴ Historic England (English Heritage) (2011) *Environmental Archaeology: A Guide to Theory and Practice of Methods, from Sampling and Recovery to Post-excavation* (2nd Edition). (Online). Available at: <https://historicengland.org.uk/advice/technical-advice/archaeological-science/environmental-archaeology/> (Accessed July 2024)

⁵ Historic England (2015) *Archaeological and Historic Pottery Production Sites: Guidelines for Best Practice*. (Online). Available at: <https://historicengland.org.uk/images-books/publications/archaeological-and-historic-pottery-production-sites/> (Accessed July 2024); Historic England (2017) *Organic Residue Analysis and Archaeology: Guidance for Good Practice*. (Online). Available at: <https://historicengland.org.uk/images-books/publications/organic-residue-analysis-and-archaeology/> (Accessed July 2024).

- 5.4.27. Finds will be temporarily stored on-site and removed from site to a secure location as required. Waterlogged organic finds, such as wood and leather, should be removed from site on the day that they are excavated and transferred to a suitable location with facilities to maintain them without degradation of the material.
- 5.4.28. Finds and samples will be exposed, lifted, cleaned (except for organic remains), conserved, marked, bagged, boxed and stored in line with the standards in:
- Watkinson & Neal (1988) First Aid for Finds;⁶
 - Chartered Institute for archaeologists (2014) Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials;⁷
 - Historic England (2017) Organic Residue Analysis and Archaeology: Guidance for Good Practice;⁸ and
 - The requirements of the recipient museum (the receiving museum will be identified in the relevant SSWSI).
- 5.4.29. A discard policy acceptable to the relevant recipient museum will only be implemented following quantification, assessment, and recommendation from artefactual and environmental specialists. Certain classes of material, such as post-medieval pottery and building material, may be discarded after recording if a representative sample is kept, but no finds will be discarded without the prior approval of the relevant Archaeological Curator and associated Archive.
- 5.4.30. Where finds require conservation, this will be done in accordance with the guidelines of the Institute for Conservation.

Scientific dating

- 5.4.31. Achieving coherent intra and inter-site chronologies across all phases of activity is a key objective as this may help resolve problems in the identification of cultural activity during period when ceramics were not generally available to communities, or where features do not contain readily datable artefacts. A strategy for the selection of samples for scientific dating will be set out for each Site in the relevant SSWSI, taking into consideration statistical procedures designed to enhance the accuracy of site chronologies.

⁶ Watkinson & Neal (1988) First Aid for Finde. (Online). Available at: <https://www.icon.org.uk/groups-and-networks/archaeology/first-aid-for-finds.html> (Accessed July 2024)

⁷ Chartered Institute for archaeologists (2014) Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials. (Online). Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26G Finds_2.pdf (Accessed July 2024)

⁸ Historic England (2017) Organic Residue Analysis and Archaeology: Guidance for Good Practice. (Online). Available at: <https://historicengland.org.uk/images-books/publications/organic-residue-analysis-and-archaeology/> (Accessed July 2024)

- 5.4.32. Samples of material suitable for scientific dating techniques including Accelerator Mass Spectrometry (AMS) Carbon 14 dating, archaeomagnetism (for example, charred seeds or in situ burnt clay from appropriate contexts), or thermoluminescence will be collected where available in accordance with individual SSWSIs. Where a specialist may be required to visit the Site and collect samples this will be identified at the earliest opportunity.
- 5.4.33. Scientific dating will be a significant consideration during the post- excavation assessment and the assessment of the chronology within a Bayesian framework should be considered if significant remains or sequences are identified.
- 5.4.34. Scientific dating, undertaken concurrent with the excavation fieldwork, may be required to inform levels of sampling of certain features or structures, such as wooden trackways. If there is the potential for significant waterlogged wooden remains to be found, a wood specialist may be required on site to records and sample remains, and dendrochronology specialists be used to support the dating of remains where necessary.

5.5. Procedures in Respect of Statutory Designated Remains

Human remains

- 5.5.1. In the event of archaeological human remains being encountered they will be left in situ, covered and protected and the Coroner, and the relevant recipient museum will be informed. Human remains will be left in situ during evaluation work, unless considered at risk or there is value in lifting the human remains to guide future mitigation. During the mitigation phase of works, it is expected that all human remains will be fully excavated, and that this will be done at the earliest opportunity following their discovery.
- 5.5.2. The Archaeological Contractor will arrange receipt of the appropriate documentation and License from the Ministry of Justice, to enable the legal removal of any human remains encountered in the works. The Archaeological Contractor is to comply with the conditions of any issued License.
- 5.5.3. If removal is agreed, all subsequent work will comply with relevant regulations (including local authority environmental health regulations) and technical guidance.⁹
- 5.5.4. The Archaeological Contractor will have available within the team, or on call, an appropriately qualified and experienced osteo-archaeologist, to supervise the excavation and removal of human remains from the Site. The Archaeological Contractor will use an appropriately qualified and experienced archaeological conservator to assist where appropriate in the lifting of human remains, and grave goods/cremation vessels.

⁹ Historic England (2018) *The Role of the Human Osteologist in an Archaeological Fieldwork Project*. (Online). Available at: <https://historicengland.org.uk/images-books/publications/role-of-human-osteologist-in-archaeological-fieldwork-project/> (Accessed July 2024).

Protected military remains

- 5.5.5. The Protection of Military Remains Act 1986 applies to any aircraft which have crashed while in military service, and to certain wrecks of vessels which were wrecked while in military service. Protection of Military Remains Act 1986 makes it an offence to disturb, move, or unearthen military remains which have been designated.
- 5.5.6. There are no designated protected areas or controlled sites within the Site boundary, and there are no records of military vessels or aircraft having been lost within the Site boundary.
- 5.5.7. Where remains are observed during archaeological investigation or construction work, intrusive work should cease, and the Site be secured while consultation with the Ministry of Defence is undertaken.

Treasure

- 5.5.8. Any items which are recovered which could be deemed as treasure will be subject to the provisions of the Treasure Act 1996, and the Treasure (Designation) Order 2002. Such material shall normally be removed from site to a secure location at the end of the working day on which it is found. In addition to the statutory authorities, the relevant Portable Antiquities Officer should be informed.

5.6. Post-excavation Work, Reporting and Dissemination

Finds

- 5.6.1. All finds processing, conservation work and storage of finds must be carried out in compliance with the Chartered Institute for Archaeologists Guidelines for the collection, documentation, conservation and research of archaeological materials. Finds should not be left unprocessed on site during the completion of the fieldwork.
- 5.6.2. The deposition and disposal of artefacts must be agreed with the legal owner and the relevant recipient museum prior to the work taking place.
- 5.6.3. All retained artefacts must be cleaned and packaged in accordance with the requirements of the recipient museum.

Site Archive

- 5.6.4. Before the commencement of fieldwork, contact should be made with the landowners and relevant recipient museum to make the relevant arrangements. Details of land ownership should be provided by the Applicant.
- 5.6.5. The Archaeological Contractor will specify the relevant recipient museum, and confirm that arrangements for receipt of archaeological material, and site archives, have been agreed before the commencement of fieldwork.
- 5.6.6. The archive and the finds must be deposited in the relevant recipient museum within six months of completion of the post-excavation work and report.

- 5.6.7. The relevant Archaeological Curator will require confirmation that the archive has been submitted in a satisfactory form.

Reporting

- 5.6.8. Reports will be produced for all archaeological survey and fieldwork undertaken. The type of report produced will reflect the nature of the investigations, as detailed below. Reports must also be produced for all archaeological investigations undertaken.

Evaluation Trenching

- 5.6.9. Where evaluation trenching is undertaken, an initial assessment of the results of the works will be undertaken, and an interim report will be made available the relevant Archaeological Curator within two weeks of completion of trenching, except where agreed otherwise with the Archaeological Curator.
- 5.6.10. The purposes of the interim report are to:
- Confirm the completion of the fieldwork;
 - provide an indicative timetable for detailed post-excavation assessment and reporting; and
 - signpost any project findings to inform research and development management pending the production of the full report.
- 5.6.11. This interim summary reporting will incorporate the following:
- Mapping of the works undertaken;
 - Key findings set out as bullet points highlighting any key observations and implications for the agreed Research Agenda;
 - An updated project design with indicative timetable compiled and agreed for post-excavation assessment and full reporting; and
 - Indicative scope of Post Excavation Assessment.
- 5.6.12. It is intended that the interim report presents only a very brief synthesis of the results of the fieldwork to allow for early dissemination of summary results and project planning. Tables or bullet points should be used to provide a concise but intelligible summary. Detailed plans and maps or analysis of stratigraphic, artefactual or ecofactual material should not be included.
- 5.6.13. Full and detailed reporting of the results of the trial trenching should be produced within six weeks of the completion of fieldwork, except where agreed otherwise by the relevant Archaeological Curator (e.g. where further works are carried out immediately and reporting of trial trenching is more logically deferred to the production of the final reporting of archaeological fieldwork).
- 5.6.14. A draft of the full illustrated report will be compiled on the results of the fieldwork and assessment of the artefacts, palaeoenvironmental samples etc. The report will include: a non-technical summary; an introduction to the project; an archaeological and historical background; an objective text account of the archaeological results,

supported by tabulated data that enables appropriate re-assessment of the results by other parties without recourse to the project archive; a quantification and assessment of the finds and environmental materials; and an interpretative conclusion regarding the archaeological content of the Site. The report will include appropriate illustrations of the Site, its context and individual trenches, features and contexts where appropriate.

- 5.6.15. A single hard copy, and a digital version of the revised report will be submitted upon receipt of comments on the draft report.
- 5.6.16. A project CD will be submitted containing image files in JPEG or TIFF format, digital text files in Microsoft Word format, and illustrations in an up-to-date AutoCAD format. A fully collated version of the report will be included in PDF format.
- 5.6.17. A hard copy of the report will be lodged with the relevant local planning authority, as directed by the Archaeological Curator upon completion.
- 5.6.18. The Archaeological Contractor will submit a digital version of the report with Online Access to the Index of Archaeological Investigations at <http://www.oasis.ac.uk/>. A copy of the full summary sheet shall be included as an appendix to the report.
- 5.6.19. The archive will consist of the report, within which documentary and raw and processed digital data records generated during the fieldwork, will be presented. This will include a georeferenced .dxf or GIS shapefile copy of the interpretation of the results for the relevant Historic Environment Register.
- 5.6.20. This report will be part of the larger project archive.

Post-excavation Assessment (PXA)

Purpose

- 5.6.21. The intention of undertaking a Post Excavation Assessment (PXA) is to provide a summary of the results of the fieldwork and material recovered during the excavation, to consider its potential to address archaeological questions, and to allow costed recommendations to be made for further investigation of artefacts and environmental material recovered during excavation and final reporting, which will be carried out following the completion of all the archaeological fieldwork.
- 5.6.22. The PXA is intended to be a summary document rather than a detailed record. However, the level of reporting will provide sufficient detail to allow recommendations to be made, fully costed and justified.
- 5.6.23. Excavation plans for each Site will be supplied to the relevant Archaeological Curator in a georeferenced GIS compatible format, for example shapefiles.
- 5.6.24. Drafts of the PXA will be provided for review by the relevant Archaeological Curator, followed by a single hard master-copy, and a digital version of the final report, which will be submitted after the receipt of comments on the draft reports. The PXA will also include a completed OASIS form as an appendix.

Form

5.6.25. The PXA will comprise:

- Introduction
 - ▶ Scope of the Project;
 - ▶ Circumstances and dates of fieldwork and previous work; and
 - ▶ Comments on the organisation of the report.
- Original research aims;
- Summary of the documented history of the Site(s);
- Interim statement on the results of fieldwork;
- Summary of the site archive and work undertaken for assessment:
 - ▶ Site records: quantity, work done on records during post-excavation assessment;
 - ▶ Finds: factual summary of material and records, quantity, range, variety, preservation, work done during post-excavation assessment. All artefacts must be fully quantified by context, material type and date, and presented in tabular format;
 - ▶ Environmental material (recovered by hand): factual summary of quantity, range, variety, preservation, work done on the material during post excavation assessment including quantification by context and material type in tabular format, of human and animal bone, shell, wood etc;
 - ▶ Environmental material (recovered through sampling): factual summary of quantity range, variety, preservation, work done on the material during the PXA, including quantification by context, sample number, and type of sample (eg. Bulk, dendrochronological, monolith) in tabular format. The percentage of each sample that has a) been processed and b) analysed must be described; and
 - ▶ Documentary records: list of relevant sources discovered, quantity, variety, intensity of study of sources during post-excavation assessment.
- Potential of the Data:
 - ▶ An appraisal of the extent to which the site archive might enable the data to meet the research aims of the Project, sub-divided according to the research aims of the Project rather than the form of the data;
 - ▶ A statement of the potential of the data in developing new research aims, to contribute to other projects and to advance methodologies; and
 - ▶ Summary statement of the significance of the data.
- Additional information will normally include:
 - ▶ Supporting illustrations at appropriate scales;

- ▶ Sufficient supporting data, tabulated or in appendices, and/or details of the contents of the Project archive, to permit the interrogation of the stated conclusions; and
- ▶ Index, references and disclaimers.

Updated Project Design (UPD)

Purpose

- 5.6.26. An Updated Project Design for the whole HyNet North West Hydrogen Pipeline Project archaeological project will be prepared on completion of the PXA, providing a scope and programme for the analysis, reporting, publication and dissemination of the findings. It will bring together the results of all stages of the archaeological project and provide a framework for further investigation of the material recovered and results.
- 5.6.27. A draft of the UPD will be provided for review by the Archaeological Curators, followed by a single hard master-copy, and a digital version of the final report, which will be submitted after the receipt of comments on the draft report. The UPD will also include a completed OASIS form appended.

Form

- 5.6.28. The UPD will include:
- Proposals for the further recording, analysis or other work required on the stratigraphic data, artefacts and ecofacts;
 - Sufficient supporting data, tabulated or in appendices, and/or details of the contents of the Project archive, to permit the interrogation of the stated conclusions;
 - Proposed discard strategy;
 - Proposals for scientific dating (potentially an initial suite of dates and a second after provisional results from the artefact and ecofact analysis are received);
 - Proposals for a Bayesian analysis to refine chronologies, with regard to the selection of contexts and samples for scientific dating;
 - Proposals for comparative analysis of the geophysical survey and excavation results, particularly correlations of results by: size/type of features; archaeological period; and underlying geology and soil types;
 - Proposals for further research;
 - Proposals for final reporting and publication, including format/medium and a synopsis of the content;
 - Proposals for any further work required on the project archive, such as consolidation or conservation;
 - Task lists, programme, costings and timescale for the proposed further work, to include publication (both academic and popular) and archive deposition;

- Details of the proposed project team;
- Proposals for continuing liaison and communication with the relevant Archaeological Curator during the remaining post-excavation process.

Online Access to the Index of Archaeological Investigations (OASIS)

- 5.6.29. The overall aim of the OASIS project is to provide an online index to the mass of archaeological grey literature that has been produced as a result of the advent of large-scale developer funded fieldwork.
- 5.6.30. The archaeological consultant or contractor must therefore complete the OASIS form (available at <http://ads.ahds.ac.uk/project/oasis/>) in respect of the scope of works set out in each SSWSI.
- 5.6.31. Once a report has become a public document by submission to or incorporation into the relevant HER, the HER will validate the OASIS form, thus placing the information into the public domain on the OASIS website. The Archaeological Contractor must indicate that they agree to this procedure within the method statement submitted to the relevant Archaeological Curator.

Publication

- 5.6.32. Formal publication of the results of some or all of the fieldwork is likely to be required. The results of the works will be reviewed and decisions taken on the scope and level of any publication(s) following the submission of the PXA reports and review. This will consider the most appropriate route for dissemination, and the scope of any dissemination, including consideration of whether thematically or chronologically related Sites should be reported together. Details of publication will be addressed in the UPD.
- 5.6.33. Provision will be made for full grey literature research archive reports for all Sites that do not proceed to publication.
- 5.6.34. Provision to contribute to annual summaries relating to the relevant Archaeological Curator.

Public Outreach

- 5.6.35. It is recognised that the archaeological works will generate significant public interest. In response to this, a programme of public outreach will be instigated.
- 5.6.36. A detailed scope for outreach will be developed by the archaeological contractor, with support from Cadent and agreed with the relevant Archaeological Curator in advance of the commencement of the archaeological mitigation works, and may include some or all of the following as appropriate:
- A regularly updated social media presence reporting the important discoveries and promoting specific engagement events (e.g. talks, open days etc.) at an appropriate stage;
 - Press releases to local media where particularly significant remains are identified or where specific events are to be promoted and can appropriately be

communicated. These would be coordinated and issued through the wider Project communications programme.

- A series of publicly accessible talks, provided by the archaeological fieldwork contractor(s) to local interest groups, such as schools, Parish groups/councils, discussing the excavations, as they progress;
- An invitation to specialist broadcast media production(s), for example BBC *Digging for Britain*, to cover key findings or major set piece excavations in order to reach a national audience;
- A publicly accessible conference to be held at a suitable local venue, following the completion of fieldwork and post-excavation assessment, to bring together the most significant results of the archaeological project for a general audience;
- Where reasonably practicable in a safe manner, open days. This would be most relevant to the larger set-piece excavations; and
- Production of popular publications (additional to the formal publication of results) describing the significant discoveries for a general audience. Any popular publications will be linked to school curriculum at KS2, KS3, KS4.

6. Health, Safety and Environment

- 6.1.1. Health and Safety will take priority over all other requirements. A conditional aspect of all archaeological work is both safe access to the area of work, and a safe working environment. All relevant health and safety legislation, regulations, and codes of practice should be respected and adhered to. Site-specific risk assessments will be carried out in respect of each element of the mitigation fieldwork prior to commencement of the fieldwork, and copies sent to the representatives of the client for approval.
- 6.1.2. Where conflict between Health and Safety and progressing archaeological works is identified, every effort will be made by the client, in discussion with the Archaeological Contractor(s) and the relevant Archaeological Curator, to identify a safe way of completing the archaeological investigations to appropriate standards.
- 6.1.3. The Project will be carried out in accordance with safe working practices and under the defined Health, Safety and Environmental Policy.
- 6.1.4. Copies of the successful contractor's insurance policies will be required in advance by the client or their nominated representative.
- 6.1.5. The appointed Archaeological Contractor(s) will take responsibility for securing the excavation areas (eg. by fencing), provision of welfare, backfilling and reinstatement of the excavation areas and the removal of materials brought onto the Site during the excavation.
- 6.1.6. Service plans will be supplied by the appointed principal contractor. Any archaeological intervention must respect all requirements for safe stand-off distances and working practices in regard of these features.
- 6.1.7. Any specific Site security requirements will be set out within the individual SSWSIs, and these will be discussed and agreed with the Cadent and the Main Works Contractor.

7. Monitoring

- 7.1.1. The relevant Archaeological Curator must be informed of the start date and timetable in advance of the evaluation and mitigation phases commencing.
- 7.1.2. Reasonable access to the Site must be afforded to the relevant Archaeological Curator, or their nominee at all times, for the purposes of monitoring the archaeological excavations.
- 7.1.3. Regular communication between the Archaeological Contractor, the relevant Archaeological Curator, Cadent, Main Works Contractor and other interested parties must be maintained to ensure the Project aims and objectives are achieved.

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