



LEADER WATER PIPELINE DIVERSION, LAUDER

SCOTLAND

Watching Brief Report



Oxford Archaeology North

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SUMMARY

Oxford Archaeology North was commissioned by Mark Whittaker, National Grid, to undertake an archaeological watching brief during the excavation of a service trench at Leader Water near Edinburgh (centred at approximately NGR 355752 645497). National Grid appointed Jacobs UK Ltd to manage the works on their behalf.

The fieldwork was undertaken by Oxford Archaeology North between the 19th April 2016 and 24th June 2016 and comprised an archaeological watching brief associated with the groundworks. No significant archaeological remains were observed and no further archaeological work is recommended.

ACKNOWLEDGEMENTS

Oxford Archaeology North would like to thank National Grid for commissioning the project and Conrad Rees for his on-site assistance. Thanks are also due to Alisdair Curtis the consulting archaeologist at Jacobs UK Ltd and to Dr Christopher Bowles Archaeology Officer for Scottish Borders Council. The watching brief was undertaken by Phil Cook, Vickie Jamieson and Mike Birtles, the report was written by Ian Smith, and the drawings were produced by Anne Stewardson. The project was managed by Jamie Quartermaine, who also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

- 1.1.1 A written scheme of investigation was produced by Jacobs UK Ltd in relation to the proposed diversion of a National Grid high pressure gas pipeline crossing of Leader Water. The existing crossing was to be decommissioned after the new crossing had been installed. Oxford Archaeology North were commissioned to conduct an archaeological watching brief during the removal of topsoil and overburden associated with the construction of compounds, access routes and the pipeline replacement. The following report documents the results of the archaeological watching brief, and discusses them within their historical and archaeological context.

1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

- 1.2.1 The development site is located at approximately NGR 355760, 645490, near Lauder in the Scottish Borders. The site is adjacent to a steel bridge crossing of Leader Water (Plate 1 (NGR 355784 645501)) to the south east of St Leonards Farm (and the site is 410m directly east of the A68).



Plate 1: The steel bridge crossing of Leader Water

- 1.2.2 The underlying solid geology of the development area comprises Devonian and Silurian sandstone and conglomerates of the Reston Group formed by riverine and alluvial processes. The local superficial sediments include Quaternary till (diamicton) outwash sands and gravels, as well as silt, silty clay and peat (British Geological Survey). A series of palaeochannels, aligned with Leader Water, are visible to the west of the present course as crop marks via satellite imagery (Google Maps) and are reflected clearly in the nineteenth century maps between Whinny Braes and Leader Water. Historical changes to the course of this channel are

illustrated in Ainslie's Map of the Southern Part of Scotland (1821) which (when compared with the modern course) appears to indicate that a much more meandering channel (near St Leonard's Farm) has subsequently been canalised. Similarly, the OS one-inch map of 1926 illustrates a more meandering course of Boondreigh Water just to the north east of the site. In addition, there is evidence on the Ordnance Survey six inch first edition map (1862) of considerable works to manage water for St Leonards Mill (NGR 355584 645983). This took the form of a weir and mill race (Mill Lead) which was bordered by flood control banks (or 'bunds') with the mill race rejoining the main channel just to the north of the site at NGR 355783 645573. Both the topography and the sinuous line of higher ground defined by Whinny Braes (at NGR 355385 645250; close to and just east of the A68) and continuing through Crow Wood northwards to the east of St Leonards Farm, appear to delineate a probable extent of regular or seasonal flooding across the low lying ground to the west of the watching brief area. Whilst the considerable network of palaeochannels across the same area is undated, the mid-channel islands (NGR 355800 645555 and NGR 355767 645473), and adjacent eroding banks at present both to the north and in the centre of the investigated area, demonstrate the continuing dynamic nature of the watercourse that bisects the site. It is probable that any abraded artefacts recovered from such sediments have been transported from areas upstream. Riverine sediments should be expected to occur across the site and the reworking of sediments associated with the shifting river channels are likely to be a highly significant factor involved in the transport (downstream) of any ancient artefacts.

1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

- 1.3.1 ***Prehistoric Period (10,000BC-AD70):*** artefact evidence relating to this period appears to be scarce locally although Jacobs (2016, 2) have drawn attention to two re-touched flints that were recovered on St Leonards Farm (Fig 1). These artefacts (Asset 5; Canmore ID 55828) are currently held in the Wilton Lodge Museum, Hawick (Jacobs 2016, 2). The latter could either be casual losses or might relate to settlement activity in the Leader Water area. In addition, however, there is some intriguing topographic evidence from St Leonards Farm in the form of two potentially prehistoric linear features (Assets 3 and 4; Canmore IDs:91681 and 83703 respectively (Jacobs 2016, 2)). These landscape features, and a possible enclosure to the east of Leader Water at Boon Bridge (Asset 2; Canmore ID: 84432), were both revealed by aerial photography and are currently undated (Jacobs 2016, 2) but do suggest the possibility of a settled prehistoric landscape.
- 1.3.2 ***Roman Period (cAD70-410):*** Jacobs (2016, 2) noted that there is no known archaeological evidence of the Roman Period from within the immediate study area. However, they also drew attention to the fact that the A68 follows the route of Dere Street, a Roman road, and that the temporary camp to the west of the site at St Leonards Hill (Canmore ID:55839) at 70ha is the largest so far recorded in the Roman Empire (Jacobs 2016, 2).
- 1.3.3 ***Medieval Period (AD410-1700):*** Jacobs (2016, 2) drew attention to the site of St Leonards Chapel and Hospital (Asset 1; Canmore ID: 55795) which date to the medieval period and were typically located near to roads. Although the precise location for the site is not known there exists the possibility that associated contemporary features could potentially be located close to the ford crossing of Leader Water.

- 1.3.4 ***Post Medieval Period (AD1700-1900)***: deposition of artefactual evidence might be expected from this period from St Leonards Farm (NGR 355399 645795) and from the adjacent roads, tracks and the Leader Water ford (and later from the crossing at Boon Bridge (NGR 355759 645502)) and from St Leonards Mill.

2. METHODOLOGY

2.1 INTRODUCTION

- 2.1.1 A Written Scheme of Investigation (WSI) was produced by Jacobs (2016) (*Appendix 1*) defining the works required in relation to an archaeological watching brief during construction. The work was carried out in accordance with relevant Chartered Institute for Archaeologists (CIfA 2014a; CIfA 2014b) guidelines.

2.2 WATCHING BRIEF

- 2.2.1 The watching brief followed the methodology set out by Jacobs in the Written Scheme of Investigation (Jacobs 2016, 4; *Appendix 1*). An archaeological presence was maintained during the groundworks between April and June 2016. All topsoil removal was machine excavated using a toothless ditching bucket. Stripping of topsoil and other overburden was undertaken by the Contractor operating under the continuous observation of a member of Oxford Archaeology North. Stripping of all topsoil and other overburden was subject to the oversight of archaeological staff and work proceeded under the conditions set out by Jacobs (2016, 4; *Appendix 1*). Work proceeded under the condition (Jacobs 2016, 4; *Appendix 1*) that Oxford Archaeology North staff were satisfied that no remains of archaeological interest were present in the specified area. A daily record of the nature, extent and depths of groundworks was generated, together with a digital photographic record.

2.3 ARCHIVE

- 2.3.1 A full professional archive has been compiled in accordance with the Written Scheme of Investigation (Jacobs 2016, 6; *Appendix 1*). Oxford Archaeology North ensured that adequate resources were provided during fieldwork to ensure that all records were checked and internally consistent. Archive consolidation was undertaken immediately following the conclusion of fieldwork. The site record was checked, cross-referenced and indexed as necessary. The archiving and post-excavation work was compiled in accordance with the requirements of the Chartered Institute of Field Archaeologists' Standard and guidance for an archaeological watching brief (CIfA 2014a). The integrity of the primary field records has been preserved and Oxford Archaeology North has created security copies in digital format of all primary field records.

3. WATCHING BRIEF RESULTS

3.1 INTRODUCTION

- 3.1.1 The objective of the watching brief was to identify, investigate and record any archaeological remains encountered during the groundworks for the new crossing, and the following is a summary of the findings. The location of the watching brief area is identified in Figure 1 and the topsoil stripped and excavated areas are shown in Figure 2.

3.2 RESULTS

- 3.2.1 Initial removal of the turf line extended to a variable depth but was generally between 0.20m and 0.50m. No artefacts were recovered other than, from the topsoil, and included a recent fish paste jar which was not retained.
- 3.2.2 **Summary:** topsoil, **001**, across the site was generally 0.1 to 0.3m (although in places up to 0.6m) in depth and often comprised a dark brown loose sandy silt with abundant poorly sorted rounded stones and river gravels. The topsoil overlay a layer which was 0.1m (minimum) in depth and comprised a mid-orange-brown loose sandy silt, **002**, with abundant rounded stones. In excavations to depths of 1.7m to locate existing pipes, this layer (**002**) was shown to overlie a red-brown-grey loose sandy silt, **003**, with a large proportion of rounded and sub-rounded small to medium river gravels and occasional large rounded to sub-rounded (0.25m x 0.15m x 0.1m) stones. Across all of the stripped areas below the topsoil are sediments (**002** and **003**) characterised by well sorted undulating bars of sand, gravel and rounded pebbles and stones.
- 3.2.3 **On the west bank of Leader Water:** topsoil stripping (19-20/05/16) on the west side of Leader Water (NGR 35700 64565) to the north of the existing gas pipe (600NB No 10 FEEDER) revealed layer **002** to a depth of 0.40m. Beneath this layer, **002**, in this part of the western side of the site, the sandy silt deposit, **003**, was revealed and was identified as naturally occurring (Plate 2). The area stripped was approximately 65m x 45m at its greatest extent. Subsequently (23-24/06/16) this topsoil stripped area was further extended by 30m northwards to the west of the access road (NGR 355718 645582) (Plate 3). The topsoil of mid-brown-red sandy silt, **001**, was here up to 0.6m in depth and was seen to overlie alluvial gravel and sand bars.



Plate 2: Topsoil stripping on the west side of Leader Water to the north of the existing gas pipe facing north-west (at c NGR 35700 64565). Layer **002** is visible across much of the area and the underlying deposit, **003**, comprises the large stones in the middle of the image



Plate 3: A topsoil stripped area extended northwards revealing riverine sediments, facing north-west (at c NGR 355718 645582)

- 3.2.4 Topsoil stripping (20/05/16) across an area 6m x 35m to the south of the existing gas pipe (600NB No 10 FEEDER) revealed no archaeological features although layer **002** was exposed.
- 3.2.5 On the west side of the site, excavations were undertaken (05/05/16) to reveal the current gas pipe (600NB No 10 FEEDER) (Plate 4); problems with water ingress were encountered as the trench reached the level of the water table. The work revealed the same stratigraphic sequence as elsewhere on the site but with the disturbance of sediments relating to the original cut for the gas pipe.



Plate 4: Excavations on the west side of the site (at c NGR 355694 645531) to reveal the existing gas pipe (600NB No 10 FEEDER) facing north-north-east

- 3.2.6 To the east of the latter excavations, more topsoil stripping had been undertaken (19-20/04/16) across linear areas bounded by the existing field boundary fence and track to the west of Leader Water (Fig 2; Plate 5) at NGR 355708 645432. As elsewhere the topsoil inclusions comprised abundant stones and river gravels and the ground surface was noted to be undulating.



Plate 5: Topsoil stripped from an area to the west of Leader Water (at c NGR 355708 645432) facing north-eastwards

- 3.2.7 These linear areas, stripped of topsoil, were extended southwards (21/04/16) to c NGR 355680 645404, and then (06/05/16) to circa NGR 355665 645380 to form a working car park and compound. Topsoil stripping across this western area revealed sandy river sediments [context (002)] and no archaeological features were identified (Plate 6).



Plate 6: Stripping of the topsoil (06/05/16) prior to extending the car parking area at the south west side of the site (at c NGR 355665 645380) facing north-eastwards

- 3.2.8 **On the east bank of Leader Water:** to the north of the existing pipe (600NB No 10 FEEDER) and to the south, and approximately parallel, to the road, an area some 40m x 15m (NGR 355825 645449) was stripped (17/05/16) of topsoil. The topsoil across this strip was generally 20-25cm deep although slightly deeper in the north-west corner (NGR c 355842 645439) (Plate 7). No archaeological features were revealed.



Plate 7: On the east bank of Leader Water facing westwards across a 40 x 15m area stripped of topsoil (at c NGR 355842 645439) with the steel bridge in the background

- 3.2.9 To the south of the latter area, work was centred at c NGR 355814 645432 (Fig 2) and was undertaken (04/05/16) across a 10m x 3m area to locate the existing pipe; these excavations extended to a depth of 1.7m. The trench revealed the same basic riverine stratigraphic sequence (**001**, **002** and **003**) as seen for the corresponding exploratory excavations on the west side but again with disturbance of sediments relating to the original cut for the gas pipe (Plate 8).



Plate 8: Excavations to locate the existing gas pipe on the east bank of Leader Water (at c NGR 355814 645432) facing westwards

- 3.2.10 To the south of the latter area a further c30 x 8m at c NGR 355811 645422 was stripped (18/05/16) of topsoil followed by further stripping (22-23/06/16) southwards across an area (NGR 355833 645330) that was approximately 55m x 70m (Plate 9) to the west of the tree fringed escarpment that delineates the easterly side of the Leader Water valley. The topsoil here was described as a mid-grey-brown sandy silt with occasional poorly sorted, rounded pebbles (<100mm). No archaeology was revealed and, as elsewhere, sediments of fluvial origin were described.



Plate 9: Topsoil stripping of an area (45m x 70m) adjacent to the escarpment on the eastern side (at c NGR 355833 645330) facing south-south-west

4. CONCLUSION

4.1 DISCUSSION

- 4.1.1 A watching brief was maintained during all top-soil strip operations undertaken during the laying of the pipeline diversion across Leader Water. The topsoil stripping was undertaken between the 19th April 2016 and 24th June 2016 and was intended to reveal the routes of existing services and the intended replacement. It was excavated using a 360° excavator with a toothless ditching bucket. A close examination was maintained of all deposits and potential features during these operations, but despite this no archaeological remains or deposits were observed during the topsoil stripping. The work suggests that riverine sediments extend across the excavated area and the impact of undated shifting river channels largely accounts for the stratigraphic sequence observed.
- 4.1.3 **Recommendations:** given that no archaeological features have been identified during this continuous presence watching brief, it is recommended that no further mitigation is necessary.

5. BIBLIOGRAPHY

5.1 CARTOGRAPHIC SOURCES

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Ordnance Survey, 1926, 1" map popular edition, Edinburgh, Sheet 74

Ordnance Survey, 1862 (Surveyed 1857), 6" to 1 mile first edition map, Berwickshire: Edinburgh, Sheet XX.13 (Lauder)

5.2 SECONDARY SOURCES

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English Heritage, 2011 *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation*, Portsmouth

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APPENDIX 1: WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL MONITORING, PREPARED BY JACOBS 2016

1. Introduction

A Detail Design Study (DDS) has been carried out for the proposed diversion of a National Grid high pressure gas pipeline crossing of Leader Water. The proposed option is to install the new crossing parallel to the existing pipeline using an open cut technique. The existing pipeline crossing would be decommissioned and removed following commissioning of the new diversion. The river is to be dammed during this time with connectivity maintained by flume pipes. The works will be carried out as a Permitted Development.

1.1 Purpose and Scope of this Written Scheme of Investigation

This Written Scheme of Investigation (WSI) defines the works required in relation to an archaeological watching brief during construction. Please note that this WSI provides a specification for an archaeological watching brief (Section 4). A method is also provided in Section 4.4 should archaeological remains be identified that cannot be investigated and recorded under the archaeological watching brief.

1.2 Roles

The roles relevant to this WSI are identified in Table 1 below:

Table 1: Roles

The Employer means National Grid.

The Consultant means a named individual from Jacobs UK Ltd appointed by the Employer to manage the Contractor on their behalf

Archaeological Contractor means Oxford Archaeology North

The Curator(s) means Scottish Borders Archaeology Service

The Contractor means Murphy the principal contractor as defined in CDM Regulations 2015.

1.3 Provisional Programme

Topsoil stripping is due to commence 18th April 2016 and is estimated to last for a total of eight days.

2. Background

2.1 Geological Background

The superficial deposits are fluvial deposits of Flandrian Age and typically comprise soft to firm consolidated, compressed silty clay but may contain layers of silt, sand, peat and basal gravel.

The bedrock geology is sedimentary and was formed during the Devonian and Silurian periods and comprises red and purple conglomerates that are fine to coarse grained and chiefly composed of rounded greywacke pebbles and boulders in a red-brown sandstone matrix with some interbedded pebbly sandstones and thin red brown siltstones and mudstones (British Geological Survey(<http://mapapps.bgs.ac.uk/geologyofbritain/home.html> accessed March 2016).

2.2 Archaeological and Historical Background

2.2.1 Prehistoric Period (10,000BC – AD500)

Evidence of activity during this period is attested by the discovery of two re-touched flints on St Leonards Farm; stone being used for tool production throughout the prehistoric period (10,000BC to AD500) (Asset 5; Canmore ID: 55828) and currently held in the Wilton Lodge Museum, Hawick.

Possible further evidence of settlement activity during this period is attested by the possible enclosure at Boon Bridge (Asset 2; Canmore ID: 84432) and two linear features at St Leonards Farm (Assets 3 and 4; Canmore IDs: 91681 and 83703 respectively) revealed by aerial photography of which no further information is available. While undated, it is possible that the features recorded on the photographs date to this period.

2.2.2 Roman Period (cAD70 - 410)

Whilst there is no known archaeological evidence of the Roman Period (cAD70 – 410) from within the immediate study area the A68 follows the route of Dere Street, a Roman road. The temporary camp at St Leonards Hill (Canmore ID:55839) at 70ha is the largest so far recorded in the Roman Empire.

2.2.3 Medieval Period (AD500 – 1700)

Evidence of the Medieval Period includes the site of St Leonards Chapel and Hospital (Asset 1; Canmore ID: 55795). Hospitals were founded throughout the Medieval Period by the Church to support their aims of charity and piety, by caring for the poor and needy. Although as the Latin root *hospitum* suggests they also provided lodgings for travellers and as such were often sited close to roads.

2.2.4 Post Medieval Period (AD1700 – 1900)

The 18th and 19th centuries marked a period of agricultural improvement in three areas across Scotland. Yields were significantly increased through changes in manuring practices, the widespread use of enclosure, the introduction of new crops and a greater understanding of the principals of crop rotation. The quality of livestock improved as new breeds, selective breeding techniques and the beginnings of specialisation were introduced. This was also a period of increased mechanisation and technological change with the introduction of reaping, binding and threshing machines and the swing plough.

3. Aims and Objectives

3.1 Objective

All work shall be planned, managed and carried out in accordance with the requirements and standards set by the Chartered Institute for Archaeologists (CIfA) in their Standard and guidance for an archaeological watching brief (CIfA, 2014a). The latter guidance defines the purpose of a watching brief as follows:

“...to allow, within the resources available, the preservation by record of archaeological deposits, the presence and nature of which could not be established (or established with sufficient accuracy) in advance of development or other potentially disruptive works;

to provide an opportunity, if needed, for the watching archaeologist to signal to all interested parties, before the destruction of the material in question, that an archaeological find has been made for which the resources allocated to the Watching Brief itself are not sufficient to support treatment to a satisfactory and proper standard.” (CIfA, 2014a, 2).

3.2 Aims

The Conceptual Design Study (Jacobs, 2015) recommended that an archaeological watching brief be maintained during any ground breaking works associated with the pipeline replacement, provision of access routes and compound construction. The aim of the archaeological watching brief is to ensure that any archaeological remains are identified during the course of construction, and to mitigate the impact of the construction of the scheme on any such remains by making a record of them. More specific aims and objectives are:

- to identify, investigate and record any such archaeological remains to the extent possible by the methods put forward in this WSI;
- to determine (so far as possible) the stratigraphic sequence and dating of features identified; and
- to disseminate the results through deposition of an ordered archive at Historic Environment Scotland (HES), the deposition of a detailed report at the Scottish Borders Council Archaeology Service, and the report made available through the Online Access to the Index of Archaeological Investigations (OASIS) Project website.

4. Specification for an Archaeological Watching Brief

4.1 Scope of Work

The Archaeological Contractor shall undertake the following:

- Undertake a watching brief on the removal of topsoil and overburden associated with construction compounds, access routes and pipeline replacement; and
- Preparation of an Archaeological Report detailing the results of the watching brief on the removal of topsoil and overburden.

The archaeological watching brief shall be undertaken in accordance with this WSI and with best practice guidance including but not limited to the examples provided in the references.

4.2 Methodology for Archaeological Watching Brief during topsoil removal

All topsoil removal shall be undertaken using a toothless ditching bucket.

Stripping of topsoil and other overburden shall be undertaken by the Contractor operating under the continuous observation of a member of the Archaeological Contractor's archaeological staff. Sufficient archaeologists shall be present to ensure that all stripping is properly monitored.

Stripping of topsoil and other overburden shall remain subject to the oversight of the Archaeological Contractor and no further construction operations may commence until they have issued in writing a 'clearance to proceed' to the Contractor. The Archaeological Contractor may issue such clearance in any of the following circumstances:

- they are satisfied that no remains of archaeological interest are present in the specified area;
- they are satisfied that all remains of archaeological interest in the specified area have been identified, investigated and recorded in accordance with the requirements set out below; or
- they are satisfied that, although there remains a possibility that unidentified archaeological remains are present in the specified area, no further ground disturbance will take place that would result in the exposure or disturbance of those remains.

4.3 Investigation and Recording of Archaeological Remains

Where archaeological remains are identified which in the judgment of the Archaeological Contractor are of low density or complexity, and where they can reasonably do so without compromising the ongoing watching brief, the Archaeological Contractor shall investigate and record the remains according to the methodology set out below. Where this is not feasible because the remains are too complex or extensive to be investigated with the available resources or without compromising the ongoing watching brief, then the contingency arrangements set out at Section 4.4 below shall be implemented.

Unless otherwise agreed with the Curator, the Archaeological Contractor shall undertake archaeological excavation by hand of any archaeological remains identified in accordance with the following strategy:

- discrete negative features (less than 1m diameter): at least 50% by area in addition to all stratigraphic relationships;
- discrete negative features (more than 1m diameter): at least 50% by area in addition to all stratigraphic relationships;
- discrete negative features containing good assemblages: 100%;
- non-structural linear negative features: at least 20% by area in addition to all stratigraphic relationships and termini;
- structural negative features: 100%;
- other features: 25%;
- 100% of all inhumations and cremations; and
- All wall lines and other post medieval features shall be recorded by plan and section. A section through wall and foundation trenches should be excavated and recorded.

Hand-cleaning of features or selected areas shall be undertaken to clarify the extent of, or relationship between, features/deposits. Where deemed appropriate by the Consultant, linear features may be investigated by mechanical excavation of the section followed by cutting-back the exposed face by hand excavation. Relationships between intersecting features shall be determined by hand-excavation. All hand-excavation shall be carried out in a stratigraphic manner.

All excavated contexts shall be fully recorded by a descriptive written context record for each stratigraphic unit, together with full photographic records and drawn plans and sections at appropriate scales. All excavated features and deposits shall be recorded photographically using, as a minimum, 35mm black and white negative film and high resolution digital photography. Additional illustrative photographs shall be taken as appropriate using colour slide film, and/or digital photography. All black and white record photographs should be taken using silver based film only (such as Ilford FP4, HP5 or Delta 400 Pro). Chromagenic (dye-based) films are not acceptable because they are not archive stable. Black and white film should be processed to British Standard 5699 as this is recognised as being suitable for long-term storage (Brown 2011, 13). A high resolution digital camera with a minimum resolution of ten megapixels shall be used for the production of colour images. Digital images shall be supplied in uncompressed TIFF format for long-term storage and accessibility.

All finds shall be recorded by context as a minimum and significant finds shall be recorded individually. Soil or other samples for potential palaeoenvironmental analysis or scientific dating shall be collected

from suitable contexts, including any waterlogged deposits, deposits visibly rich in charred or other organic materials or other deposits as appropriate, in accordance with best practice.

If any human remains are encountered, the appropriate procedures shall be adhered to, including notification to the local Police and the Curator.

Small-scale hand-excavation shall be undertaken where necessary to clarify the nature or significance of features or deposits, or to facilitate recording, or for hand-cleaning of sections or other surfaces as part of the recording process.

All finds of potential archaeological value shall be retained and removed from the site; cleaned, catalogued and appropriately packaged. All recording, cleaning, storage and conservation of finds shall be in accordance with the Chartered Institute for Archaeologists' Standard and guidance for the collection, documentation, conservation and research of archaeological materials (CIfA, 2014b). The Archaeological Contractor should note that consultation will be required with the Treasure Trove Unit prior to the removal of finds from Scotland to England for conservation and analysis. For guidance please refer to http://www.treasuretrovescotland.co.uk/Information_for_excavators.html.

Should waterlogged remains be encountered during the investigations the strategies for their recovery and treatment will be in accordance with the appropriate national guidance, including English Heritage's guidelines on Waterlogged Organic Artefacts: Guidance on their Recovery, Analysis and Conservation (2012). The Archaeological Contractor shall also liaise with the Consultant who will liaise with the Curator about the treatment of waterlogged remains.

Should the need arise for environmental sampling to be undertaken, then all aspects of the collection, selection, processing, assessment and reporting on those environmental samples shall be undertaken in accordance with the principles set out in Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation (English Heritage 2011) and with reference to the Association for Environmental Archaeology's Working Paper No. 2, Environmental Archaeology and Archaeological Evaluation (1995).

Subject to this strategy and the agreement of the Consultant, samples to be collected from suitable deposits shall include:

- a sample of 40-60 litres (or, if the volume of the deposit is less than 40 litres, the whole deposit) for wet sieving, from all suitable deposits; and
- where deposits of particular potential interest are identified, and on the advice of the relevant specialist, additional special samples shall be collected. These could include additional monoliths, or other small samples for other special analyses. Where waterlogged deposits are identified, more intensive sampling shall be undertaken subject to the agreement of the Consultant and on the advice of the relevant specialist.

4.4 Contingency Arrangements

Where archaeological remains are identified which, for whatever reason, cannot be properly investigated and recorded with the resources available on site, without compromising the ongoing watching brief, then the Archaeological Contractor shall mark-out the relevant area in an appropriate manner and notify the Contractor and Consultant. Plant or vehicles shall not be permitted to enter the marked-out area except if given clearance to do so by the Archaeological Contractor. All construction works within the marked-out area shall be suspended until completion of the archaeological investigation in that area.

Notification of discoveries as set out above shall be made within one working day of the discovery, and shall include a brief outline of what has been discovered.

After such notification, the Archaeological Contractor will initiate a meeting between the Curator, the Consultant and the Employer (or their representatives) to determine the need for, nature and scope of any further archaeological investigation and recording works. Following this meeting and within 5 working days of receipt of a written instruction from the Consultant to do so, the Archaeological Contractor shall submit to the Consultant for approval a Project Design detailing how these features/sites are to be mitigated in accordance with the requirements of this specification. The Consultant shall seek the Curators approval for the Project Design prior to the works taking place.

4.5 Site Archive

The Archaeological Contractor will ensure that adequate resources shall be provided during fieldwork to ensure that all records are checked and internally consistent.

Archive consolidation shall be undertaken immediately following the conclusion of fieldwork.

The site record shall be checked, cross-referenced and indexed as necessary.

All retained finds shall be cleaned, conserved, marked and packaged as necessary to maintain the archive prior to transfer.

All retained finds shall be assessed and recorded using pro-forma recording sheets, by suitably qualified and experienced staff. Initial artefact dating shall be integrated with the site matrix.

The archiving and post-excavation work shall be undertaken in accordance with the requirements of the Chartered Institute of Field Archaeologists' Standard and guidance for an archaeological watching brief (CIfA, 2014a).

The integrity of the primary field records shall be preserved and the Archaeological Contractor shall create security copies in digital format of all primary field records.

5. Post Excavation Assessment and Reporting

5.1 Post-Fieldwork Assessment

It is possible that very few archaeological remains will be recorded in which case a summary report will be adequate. In this case the structure of, and timescales for, this summary report will be confirmed with the Curator.

Each category of data and material recovered by the fieldwork (site records/stratigraphic data, each category of artefact or other find and any other data shall be examined, quantified, catalogued and assessed by suitably qualified and experienced archaeologists or specialists.

The report shall be prepared in line with the principles set out in the Chartered Institute for Archaeologist's Standard and guidance for archaeological watching brief (CIfA, 2014a). The report shall clearly acknowledge the role of the Curator, and shall show the logo of National Grid, and shall include as a minimum:

- A non-technical summary;
- Introductory Statements;
- Background to the project;
- Archaeological background;
- Methodology;
- Results;
- Discussion and Conclusion;
- A specialist assessment of any artefacts or environmental material recovered with a view to their potential for further study. Allowance should be made for preliminary conservation and stabilisation of all objects and an assessment of long-term conservation and storage needs;
- Supporting drawings, photographs etc.;
- Supporting data;
- Index to/location of archive;
- References; and
- Photographic references as an appendix identifying the subject, position and direction of each shot;

The report shall include the following reference information:

- Title page;
- Full site name;
- Site code;
- OASIS reference;
- OS National Grid Reference;
- Author;
- Organisation/contractor;

- Dates of fieldwork (date/month/year);
- Names of fieldwork staff;
- Date report written; and
- Commissioning body.

The report shall be illustrated with relevant plans, sections and a selection of digital photographs.

A draft report will be required no later than 6 weeks following completion of fieldwork.

One copy of a complete draft post-fieldwork assessment report shall be submitted in the first instance for review/checking by the Consultant, who will supply a copy to the Curator for their review. In finalising the report, the Archaeological Contractor shall take into account any comments made by the Consultant and remedy any faults identified by the Curator. The finalised report shall be submitted to the Consultant within five working days of receipt of the Consultant's and Curator's comments on the draft report.

One digital copy in PDF format of the final report will be deposited with the Curator. Digital data derived from the report will be provided in a format suitable for inclusion into the Scottish Borders HER for record enhancement purposes, and the Archaeological Contractor shall liaise with the Curator to discuss the nature and format of the material required.

Scottish Borders Historic Environment Record (HER) supports the OASIS Project. 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. On completion of the report, the archaeological Contractor will make a copy accessible to the wider research community by submitting it to the OASIS Project.

5.2 Publication

The Archaeological Contractor shall also prepare a summary of the work undertaken to Archaeology Scotland's annual publication, *Discovery and Excavation in Scotland*. One copy of the complete draft of the summary shall be submitted in the first instance for review/checking by the Consultant who shall also consult the Curator during the review period. In finalising the summary, the Archaeological Contractor shall take into account any comments and remedy any faults identified by the Consultant and the Curator.

5.3 Archive Deposition

On the completion of the post-excavation assessment and when the assemblage is ready for uplift finds shall be reported to the Treasure Trove Unit by the Archaeological Contractor, and the Consultant and the Curator shall be copied into any correspondence between the Treasure Trove Unit and the Archaeological Contractor. For guidance please refer to http://www.treasuretrovescotland.co.uk/Information_for/excavators.html.

Immediately upon completion of the reviewed post-fieldwork report, the post-fieldwork report and any data or other documentation produced during the post-fieldwork reporting shall be integrated into the site archive.

The Archaeological Contractor shall store the archive in suitable conditions in a secure location until instructions are received from the Curator for the deposition of the archive.

The archive shall be transferred to HES. A fully ordered and indexed archive from the recording works will be prepared in accordance with the Royal Commission on the Ancient and Historic Monuments of Scotland 'Guidelines for Archiving of Archaeological Projects' (2013) and will be deposited with HES. The Site Archive shall contain all the data collected during the investigation, including all primary written documents, plans sections and photographs. It shall be quantified, ordered, indexed and internally consistent.

The Archaeological Contractor shall supply the Curator with written confirmation of the acceptance of the archive by HES.

6. Health and Safety Requirements

6.1 General Health and Safety Requirements

The Archaeological Contractor shall ensure full compliance with all Health and Safety legislation and the requirements of the Contractor.

Welfare facilities will be provided by the Contractor.

The Contractor shall supply all suitable plant for the topsoil removal. All such plant shall operate under the direct and continuous supervision of the Contractor.

All Archaeological Contractor's site staff shall be Construction Skills Certification Scheme (CSCS) cardholders.

The Archaeological Contractor shall bring to the attention of the Consultant any actions by site staff or third parties that may endanger site operatives or the investigations. If these actions are considered to be of an immediate danger or compromise the safety of the investigation then the Archaeological Contractor may act accordingly.

The Contractor shall be responsible for maintaining the safety of the public.

The number of personnel shall be kept to a minimum at all times. The number of personnel required to safely and efficiently conduct the works determines the limit.

The Archaeological Contractor or the Contractor shall have the right, in the interests of safety, to halt investigations on the approach of any non-essential personnel.

The Employer, Contractor and/or the Consultant shall have the right to halt investigations in the interests of health and safety and/or to exclude the Archaeological Contractor's personnel from site in the event of a breach of health and safety policy or observance of unsafe practices or other unacceptable behaviour.

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ILLUSTRATIONS

FIGURES

Figure 1: Site location map (showing locations of Lauder and Leader Water).

Figure 2: Site plan illustrating the stripped and excavated areas observed during the watching brief.

PLATES

Plate 1: The steel bridge crossing of Leader Water

Plate 2: Topsoil stripping on the west side of Leader Water to the north of the existing gas pipe facing north-west (at c NGR 35700 64565). Layer **002** is visible across much of the area and the underlying deposit, **003**, comprises the large stones in the middle of the image

Plate 3: A topsoil stripped area extended northwards revealing riverine sediments, facing north-west (at c NGR 355718 645582)

Plate 4: Excavations on the west side of the site (at c NGR 355694 645531) to reveal the existing gas pipe (600NB No 10 FEEDER) facing north-north-east

Plate 5: Topsoil stripped from an area to the west of Leader Water (at c NGR 355708 645432) facing north-eastwards

Plate 6: Stripping of the topsoil (06/05/16) prior to extending the car parking area at the south west side of the site (at c NGR 355665 645380) facing north-eastwards

Plate 7: On the east bank of Leader Water facing westwards across a 40 x 15m area stripped of topsoil (at c NGR 355842 645439) with the steel bridge in the background

Plate 8: Excavations to locate the existing gas pipe on the east bank of Leader Water (at c NGR 355814 645432) facing westwards

Plate 9: Topsoil stripping of an area (45m x 70m) adjacent to the escarpment on the eastern side (at c NGR 355833 645330) facing south-south-west