



Craylands Lane Swanscombe, Kent

Pleistocene Geoarchaeological Watching Brief



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Summary

Wessex Archaeology was commissioned by RPS to undertake a geoarchaeological watching brief monitoring the vegetation removal from a cliff face and the excavation of several trial holes and soakaways, at a decommissioned chalk quarry at Craylands Lane, Swanscombe, Kent, centred on NGR 559785 174922. The watching brief was undertaken 08-09/10/2018, 17/10/2018, 24/10/2018, 25/01/2019, 24/07/2019, 30/07/2019 – 01/08/2019, 12/08/2019, 30/08/2019 and 05 – 09/09/2019.

This final phase of work follows previous phases of investigation including a Desk-Based Assessment, trial trench evaluation and Pleistocene Geoarchaeological test pitting to investigate the Quaternary deposits present at the site (where they survived). No archaeological features of Holocene date were found during the trial trench evaluation.

The Pleistocene Geoarchaeological test pitting established that Quaternary deposits were confined to two areas in the south-west portion of watching brief area. The deposits preserved in these areas consist of material infilling a valley cut through the chalk; this ran approximately south-west to north-east through the watching brief area prior to quarrying. The sequence reflects material deposited by slope process over an extended period, likely from the late Pleistocene to the Holocene.

The potential for the deposits to preserve artefacts and ecofacts was assessed. Gravelly horizons within the Holocene colluvium contained reworked lithic artefacts; such evidence was absent from all other deposits. Based on the results of the test pitting investigation the Pleistocene and Palaeolithic potential of the deposits across the watching brief area was regarded as low to none.

The watching brief monitored works identified sporadic and truncated occurrences colluvial deposits overlaying the chalk bedrock. Specifically, these colluvial deposits identified particularly along an exposed section beneath the quarry cliff face, and within a trial hole, Soakaway 2 and the Tank Pit. Soakaway 1 identified made ground overlaying the chalk bedrock.. The colluvial deposits identified during the watching brief are the same as those identified during previous evaluation. During the course of the watching brief no finds of any period were found.

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The fieldwork was directed by Lance Lewis, Jon Sanigar, Emilia Seredynska, Lisa McCaig and Charlotte Porter. This report was written by Jon Sanigar and edited by Rob De'Athe. The project was managed by Rob De'Athe on behalf of Wessex Archaeology.



Craylands Lane, Swanscombe, Kent

Pleistocene Geoarchaeological Watching Brief

1 INTRODUCTION

1.1 Project and planning background

1.1.1 Wessex Archaeology was commissioned by RPS, to undertake a Pleistocene geoarchaeological watching brief during groundworks associated with a new housing development in a decommissioned chalk quarry. The monitored works were centred on NGR 559785 174922, at Craylands Lane, Swanscombe, Kent (**Figure 1**).

1.1.2 Outline planning permission was granted at the site for the construction of up to 110 mixed tenure residential units, including a new vehicular access to Craylands Lane, emergency access and the creation of a development platform and associated works including the demolition of existing buildings.

1.1.3 Outline planning permission was granted on 16/02/2018 (14/01689/OUT). The outline planning permission has been varied and the current consent has ref: EDC/17/0146. Condition 12 attached to the outline planning permission relates to archaeology:

1.1.4 Condition 12:

No work on site shall take place, other than the demolition of existing buildings, until the applicant or their agents or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written specification and timetable which has been submitted to and approved by the Local Planning Authority.

Reason: To ensure that features of archaeological interest are properly examined and recorded.

1.1.5 The proposed Pleistocene geoarchaeological watching brief comprised the monitoring of a reduced dig of the development platform, to a depth of 6.8m below Ordinance Datum (OD), and drainage associated with the development (**Figure 2**). Remedial works to artificial cliffs within the site were also monitored in order to inspect and record surviving Quaternary deposits.

1.1.6 This watching brief is the final phase of a staged approach in determining the Pleistocene geoarchaeological potential of the site and will inform on the nature and distribution of Quaternary deposits. It follows non-intrusive geoarchaeological work, including a Desk-Based Assessment (DBA) and Walkover Survey (ASE 2005), a Historic Building Recording (ASE 2016) and trial trench evaluation and Pleistocene and Geoarchaeological test pit evaluations (WA 2018b).

1.1.7 The watching brief was undertaken in accordance with a written scheme of investigation (WSI) which detailed the aims, methodologies and standards to be employed (Wessex Archaeology 2018a). The County Archaeologist for KCC approved the WSI, on behalf of the Local Planning Authority (LPA), prior to fieldwork commencing. The watching brief was



undertaken 08 - 09/10/2018, 17/10/2018, 24/10/2018, 25/01/2019, 24/07/2019, 30/07/2019 – 01/08/2019, 12/08/2019, 30/08/2019, 05/09/2019 – 09/09/2019.

1.2 Scope of the report

- 1.2.1 The purpose of this report is to provide the results of the watching brief, to interpret the results within their local or regional context (or otherwise), and to assess their potential to address the aims outlined in the WSI, thereby making available information about the archaeological resource (a preservation by record).

1.3 Location, topography and geology

- 1.3.1 The watching brief area is located 1.6km northwest of Ebbsfleet International Station and 1.6km northeast of Bluewater Shopping Centre. The site is bounded to the north by London Road and vacant land, to the east by Craylands Lane and vacant land, to the south by woodland and the North Kent Line railway, and to the west and southwest by residential development.
- 1.3.2 The landscape within the watching brief area has been heavily impacted by quarrying carried out in the early 20th century. Before quarrying a dry valley ran south west-north-eastern part of the watching brief area. This was filled to a maximum depth of at least 3m of “rubbly brickearth” (Bromehead 1920).
- 1.3.3 Modern ground levels in the eastern half of the watching brief area varies from north to south between 6.0-10m AOD, whilst they are at 1.5m AOD at the base of the most extensively quarried deposits in the west.
- 1.3.4 British Geological Survey data (BGS online viewer) indicates that the underlying solid geology belongs to the Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated). In the eastern and southern portions of the watching brief area Quaternary Head deposits consisting of clay sands and gravels are recorded. Head deposits are poorly sorted cold-climate slope deposits formed through solifluction processes (alternate freeze-thawing). They are often encountered on the sides and within the base of dry valleys, the latter a landform feature typical in areas of permeable bedrock, such as chalk. These Quaternary deposits are the equivalent of the ‘rubbly brickearth’ recorded by Bromehead (1920).
- 1.3.5 A walkover survey (ASE 2005) demonstrated that the western half of the watching brief area is quarried through chalk bedrock and that chalk is present in this area to almost the top of all the exposed quarry faces; although the uppermost 2m of the westernmost face was obscured by scrub.
- 1.3.6 This western focus of quarrying activity was originally accessed via a tunnel from the east under Craylands Lane and through a tramway cutting that extended across the eastern portion of the watching brief area; this cutting is still preserved. The walkover survey (ASE 2005) indicated that areas to the immediate north and south of the tramway cutting have been less extensively quarried. Coombe rock was exposed in sections on the northern side of the cutting; these are deposits formed through solifluction processes and composed of a mix of chalk and flint contained within a chalky sediment matrix. Additionally, at least 1m deep of friable loam with common flint and chalk pebbles was visible in south side of the tramway cutting.



2 GEOARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Introduction

2.1.1 The archaeological and historical background was assessed in a prior desk-based assessment and walkover survey (ASE 2005) and the existing structures related to the former cement works were recorded in a Historic Building Recording (ASE 2016), which considered the recorded historic environment resource within a 0.25km study area of the proposed development. Information relevant for assessing the geoarchaeological potential of the watching brief area is summarized below. Additional sources of information are referenced as appropriate.

2.2 Geoarchaeological and historical context

2.2.1 The watching brief area is located immediately to the north of Barnfield Pit, Swanscombe. This locale is associated with an internationally important suite of Middle Pleistocene deposits. These have produced extensive Lower Palaeolithic archaeological assemblages, an early human fossil skull and extensive environmental datasets (Conway *et al.* 1996). The Barnfield Pit deposits form part of the Boyn Hill/Orsett Heath Member of the River Thames terrace sequence. These are thought to have aggraded between 450,000 and 350,000 BP (Bridgland 1994). The current watching brief area is mostly located below the lowermost level of the Boyn Hill/Orsett Heath deposits in the area; only the western most edge of the watching brief area had the potential to preserve such deposits. However, a walkover survey (ASE 2005) demonstrated that this area has been quarried through Chalk bedrock, whilst chalk bedrock was present to almost the top of all visible quarry faces in this area.

2.2.2 The desk-based assessment and walkover survey (ASE 2005) identified Quaternary deposits preserved in the less extensively quarried eastern and southern portions of the watching brief area (see section 1.4.6). The deposits recorded consist of slope deposits infilling the preserved portions of the dry valley which ran through the area prior to quarrying. The potential for such contexts to preserve suites of deposits associated with significant Palaeolithic archaeology and environmental datasets is demonstrated by those in the Ebbsfleet Valley, 1.75km south-east of the watching brief area. Here a complex series of slope deposits, interbedded with coarse- and fine-grained fluvial sediments have produced nationally significant Lower, Middle and Upper Palaeolithic archaeology and environmental datasets (CgMs 2015, Scott 2011; Scott *et al.* 2010; Wenban-Smith 1995, 2013).

2.2.3 There are also indications that post-Boyn Hill/Orsett Heath later Middle Pleistocene fluvial deposits may be present in the region of the watching brief area. This is based on presence of Levallois material, something which is not associated with the Boyn Hill/Orsett Heath Member, in artefact collections from nearby localities, including Dierden's Pit, New Craylands Lane Pit and Galley Hill Pit. Furthermore, lower level, post-Boyn Hill fluvial deposits that have been identified at the north side of New Craylands Lane (Wenban-Smith 1999).

2.2.4 Holocene slope deposits have been suggested to be present in the watching brief area (ASE 2005). These have the potential to contain eroded and redeposited artefacts and seal underlying stratigraphy in the form of buried former land surfaces

2.3 Recent investigations

2.3.1 Wessex Archaeology recently undertook a Pleistocene geoarchaeological evaluation through a program of test pitting at the site (WA 2018b).



- 2.3.2 The geoarchaeological evaluation comprised the excavation of 13 machine-excavated test pits. The investigations were designed to investigate the sub-surface deposits, establish their stratigraphy, their extent, and to evaluate their potential to contain Palaeolithic remains.
- 2.3.3 The evaluation established that Quaternary deposits are confined to two areas in the south-west portion of watching brief area. The deposits preserved in these areas consist of material infilling a valley cut through the chalk; this ran approximately south-west to north-east through the watching brief area prior to quarrying. The sequence reflects material deposited by slope process over an extended period, likely from the late Pleistocene to the Holocene.
- 2.3.4 The potential for the deposits to preserve artefacts and ecofacts was assessed. Gravelly horizons within the Holocene colluvium contained reworked lithic artefacts; such evidence was absent from all other deposits. Environmental evidence was present in some deposits, in all cases this either results from, or has been heavily impacted upon, by recent bioturbation.
- 2.3.5 Deposits have been correlated with the upper part of a sequence identified 150m to the south-west in Craylands Gorge (Wessex Archaeology 2004) and with Phase V of a sequence previously identified 400m to the south-west at Knockhall Road, Greenhithe (ASE 2012, Wessex Archaeology 2016, 2017); the latter have been equated to the late Devensian and early Holocene.
- 2.3.6 Based on the results of the evaluation the Pleistocene and Palaeolithic potential of the deposits across the watching brief area can be regarded as low to none

3 AIMS AND OBJECTIVES

3.1 Aims

- 3.1.1 The aims of the watching brief, as stated in the WSI (Wessex Archaeology 2018a) and as defined in the ClfA's *Standard and guidance for an archaeological watching brief* (ClfA 2014a), were:
- establish with a high degree of confidence the nature, distribution and depth of Quaternary deposits across the site;
 - assess the Palaeolithic potential of the site, and establish its importance in the context of national and regional research priorities;
 - establish a robust model for the site's Palaeolithic archaeological remains.

3.2 Objectives

- 3.2.1 In order to achieve the above aims, the objectives of the watching brief, also defined in the WSI (Wessex Archaeology 2018a), were:
- To ascertain (where any Quaternary deposits are encountered) their extent, depth below ground surface, character, date and Palaeolithic potential.
 - To establish the extent to which previous development and/or other processes have affected Quaternary deposits at the site.
 - To establish the likely impact on any surviving Quaternary deposits of the proposed development.



- To determine the presence and potential of lithic artefact evidence and faunal remains in the sediments encountered.
- To determine the presence and potential of palaeoenvironmental evidence in the sediments encountered.
- To determine the presence of, or potential for, undisturbed primary context Palaeolithic occupation surfaces in the sediments encountered.

4 METHODS

4.1 Introduction

4.1.1 All works were undertaken in accordance with the detailed methodology set out within the WSI (Wessex Archaeology 2018a) and in general compliance with the standards outlined in ClfA guidance (ClfA 2014a). The methods employed are summarised below.

4.2 Fieldwork methods

General

4.2.1 The watching brief monitored five areas within the site. The removal of vegetation from the cliff face within the western part of the site, and the excavations of two soakaways, a trial hole and the position of a tank.

4.2.2 The watching archaeologist monitored all mechanical excavations within the specified area. Where necessary, the surface of uncovered archaeological deposits were cleaned by hand. A sample of archaeological features and deposits identified was hand-excavated, sufficient to address the aims of the watching brief.

4.2.3 Spoil derived from both machine stripping and hand-excavated archaeological deposits was visually scanned for the purposes of finds retrieval. Where found, artefacts were collected and bagged by context. All artefacts from excavated contexts were retained

4.3 Recording

4.3.1 All exposed archaeological deposits and features were recorded using Wessex Archaeology's pro forma recording system. A complete drawn record of excavated features and deposits was made including both plans and sections drawn to appropriate scales (generally 1:20 or 1:50 for plans and 1:10 for sections) and tied to the Ordnance Survey (OS) National Grid. The Ordnance Datum (OD: Newlyn) heights of all principal features were calculated, and levels added to plans and section drawings.

4.3.2 A full photographic record was made using digital cameras equipped with an image sensor of not less than 10 megapixels. Digital images have been subject to managed quality control and curation processes, which has embedded appropriate metadata within the image and will ensure long term accessibility of the image set.

4.4 Artefactual and environmental strategies

4.4.1 Appropriate strategies for the recovery, processing and assessment of artefacts and environmental samples were in line with those detailed in the WSI (Wessex Archaeology 2018a). The treatment of artefacts and environmental remains was in general accordance with: *Guidance for the collection, documentation, conservation and research of archaeological materials* (ClfA 2014b) and *Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation* (English Heritage 2011).



4.5 Monitoring

- 4.5.1 The County Archaeologist for KCC, on behalf of the LPA, monitored the watching brief. Any variations to the WSI, if required to better address the project aims, were agreed in advance with both the client and the County Archaeologist for KCC.

5 ARCHAEOLOGICAL RESULTS

5.1 Introduction

- 5.1.1 A total of four excavations and one vegetation removal exercise along the cliff tops were monitored during the course of the watching brief. The deposits encountered are discussed by area of excavation below (**Figure 2**).

5.2 Soil sequence and natural deposits

Cliff face

- 5.2.1 The removal of vegetation from the cliff face (**Plate 1**) revealed a small section of head deposit overlaying the natural geology on the north facing face. This section comprised a dark greyish brown silty topsoil, measuring 0.33m in thickness, and a subsoil of mid-brown silty clay, measuring 0.5m in thickness, overlying two distinct silt units, above chalk bedrock..
- 5.2.2 The subsoil overlay 0.55m of reddish brown fine sandy silt, above 0.45m light brown fine sandy silt. **Figure 3** demonstrates that these silts form part of the Holocene colluvium and colluvial valley fill sequences identified during previous test pitting evaluation in the Site (WA 2018b). The colluvial and valley fill deposits overlay chalk, the contact with which was irregular/undulating. No artefacts were retrieved during the monitoring of the vegetation clearance.

Trial Hole

- 5.2.3 An excavation of a trial hole was excavated measuring 4m in length, 0.75m in depth and 4.4m in depth (**Plate 2**) was monitored. The uppermost deposits encountered consisted of made ground measuring 1.5m in thickness. This overlay a sequence consisting of 1m of a yellowish-brown silty clay with rare chalk flecks throughout, 1.3m of mid-greyish brown silty clay and a mid-yellowish-brown sandy silt measuring 0.6m+ in thickness. The relationship between these deposits and those identified elsewhere in the Site are illustrated in **Figure 4**. The clays and silts are a continuation of Holocene colluvium and colluvial valley fill sequences identified in the southern part of the Site (WA 2018b)
- 5.2.4 The chalk bedrock was not encountered during the excavation. No artefacts were retrieved during the monitoring of the excavation.

Tank Pit

- 5.2.5 The position for a tank was excavated to a depth of 1.9m bgl (**Plates 3, 4 and 5**). Monitoring record 1m of made ground measuring 1m overlying yellowish-brown sandy clay. The sandy clay was colluvial deposited and correlates with Holocene colluvium identified previously in this area (**Figure 3**).
- 5.2.6 Chalk bedrock was not reached in this excavation and no artefacts were retrieved during the monitoring.



Soakaways

- 5.2.7 Two soakaways were monitored during the course of the watching brief. Soakaway 1 measured 6m by 6m and was excavated to a depth of 6m bgl (**Plates 6, 7 and 8**). The excavation identified multiple layers of recently laid made ground measuring 4.6m in thickness. Made ground overlay chalk bedrock at 4.6m bgl. This sequence of made ground reflects the results of previous work in this areas of the Site (**Figure 4**). No artefacts were retrieved during the monitoring of the excavation.
- 5.2.8 Soakaway 2 measured 10m by 10m and was excavated to a depth of 8m bgl (**Plates 9 and 10**). The excavation identified a layer of made ground measuring 0.3m in thickness. The made ground overlaid a layer of colluvium comprised of yellowish-brown sandy clay measuring 0.9m in thickness, which overlaid the natural chalk bedrock. The colluvium was only observed along the southern section of the excavation. The colluvium observed in this intervention is a heavily truncated remnant of material found along the margins of a tramway cutting, which runs through the Site (**Figures 2 and 3**) No artefacts were retrieved during the monitoring of the excavation.

6 SUMMARY DISCUSSION

- 6.1.1 The geoarchaeological watching brief monitored four individual excavations and the removal of vegetation from a cliff face during the course of the proposed works. Three of the monitored excavations and vegetation removal identified surviving layers of undisturbed natural deposits comprised of colluvial sandy silts along the cliff face and within the Trial Hole, Soakaway 2 and the position of a Tank Pit. These were observed overlaying the chalk bedrock.
- 6.1.2 Soakaway 1 identified layers of made ground and contaminated/disturbed clay overlaying the natural geology comprised of chalk bedrock. Therefore, the northeast area of the site had been heavily disturbed by modern activity, and no undisturbed deposits have survived.
- 6.1.3 This watching brief recorded Holocene and Pleistocene colluvial deposits that correlate with those identified during a prior geoarchaeological test pitting evaluation within the Site (WA 2018b). This evaluation concluded that these deposits have low potential to preserve significant archaeology or geoarchaeological datasets. No archaeological evidence or palaeoenvironmental remains were recovered from these colluvial deposits during the watching brief. Additionally, no stabilization horizons with potential to preserve minimally disturbed archaeology were identified within the colluvial sequences recorded.

7 ARCHIVE STORAGE AND CURATION

7.1 Museum

- 7.1.1 The archive resulting from the watching brief is currently held at the offices of Wessex Archaeology in Maidstone. The site is located within the collecting area of Dartford Museum and Wessex Archaeology will endeavour to see that the archive is deposited. Deposition of any finds with the museum will only be carried out with the full written agreement of the landowner to transfer title of all finds to the museum.

7.2 Preparation of the archive

- 7.2.1 The archive, which includes paper records, graphics, artefacts, ecofacts and digital data, will be prepared following the standard conditions for the acceptance of excavated archaeological material by Dartford Museum, and in general following nationally recommended guidelines (SMA 1995; ClfA 2014c; Brown 2011; ADS 2013).



7.2.2 All archive elements are marked with the **site code**, and a full index will be prepared. The physical archive will be combined with the archives for previous phases of work undertaken by Wessex Archaeology, and currently comprises the following:

- 1 files/document cases of paper records and A3/A4 graphics;

7.3 Selection policy

7.3.1 Wessex Archaeology follows national guidelines on selection and retention (SMA 1993; Brown 2011, section 4). In accordance with these, and any specific guidance prepared by the museum, a process of selection and retention will be followed so that only those artefacts or ecofacts that are considered to have potential for future study will be retained. The selection policy will be agreed with the museum and is fully documented in the project archive.

7.4 Security copy

7.4.1 In line with current best practice (e.g., Brown 2011), on completion of the project a security copy of the written records will be prepared, in the form of a digital PDF/A file. PDF/A is an ISO-standardised version of the Portable Document Format (PDF) designed for the digital preservation of electronic documents through omission of features ill-suited to long-term archiving.

7.5 OASIS

7.5.1 An OASIS online record (<http://oasis.ac.uk/pages/wiki/Main>) has been initiated, with key fields and a .pdf version of the final report will be submitted following approval by the KCC County Archaeologist on behalf of the LPA.. Subject to any contractual requirements on confidentiality, copies of the OASIS record will be integrated into the relevant local and national records and published through the Archaeology Data Service ArchSearch catalogue.

8 COPYRIGHT

8.1 Archive and report copyright

8.1.1 The full copyright of the written/illustrative/digital archive relating to the project will be retained by Wessex Archaeology under the *Copyright, Designs and Patents Act 1988* with all rights reserved. The client will be licenced to use each report for the purposes that it was produced in relation to the project as described in the specification. The museum, however, will be granted an exclusive licence for the use of the archive for educational purposes, including academic research, providing that such use conforms to the *Copyright and Related Rights Regulations 2003*. In some instances, certain regional museums may require absolute transfer of copyright, rather than a licence; this should be dealt with on a case-by-case basis.

8.1.2 Information relating to the project will be deposited with the Historic Environment Record (HER) where it can be freely copied without reference to Wessex Archaeology for the purposes of archaeological research or development control within the planning process.

8.2 Third party data copyright

8.2.1 This document and the project archive may contain material that is non-Wessex Archaeology copyright (e.g., Ordnance Survey, British Geological Survey, Crown Copyright), or the intellectual property of third parties, which Wessex Archaeology are able to provide for limited reproduction under the terms of our own copyright licences, but for



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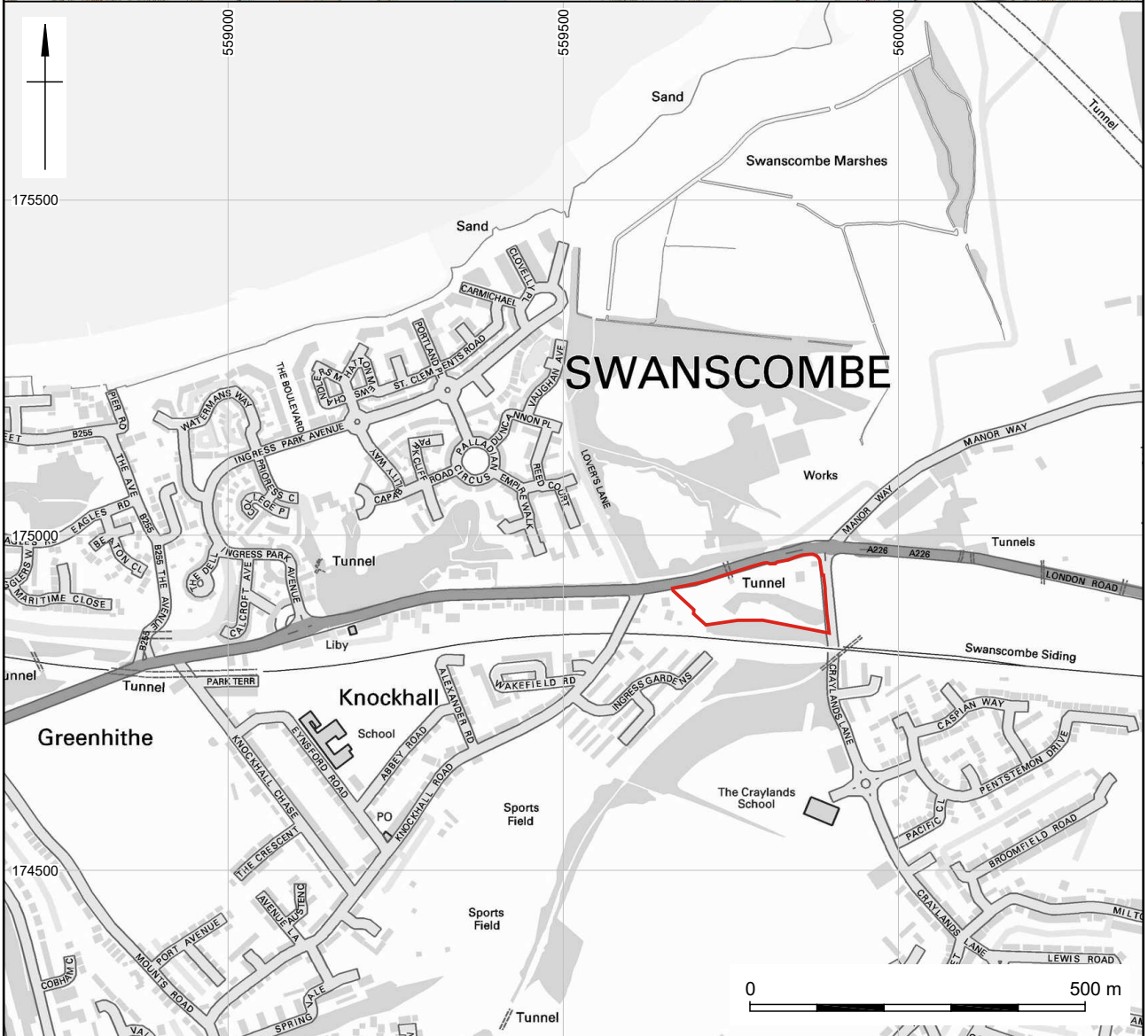
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 Site boundary



Coordinate system:
OSGB36
(OSTN15/OSGM15)

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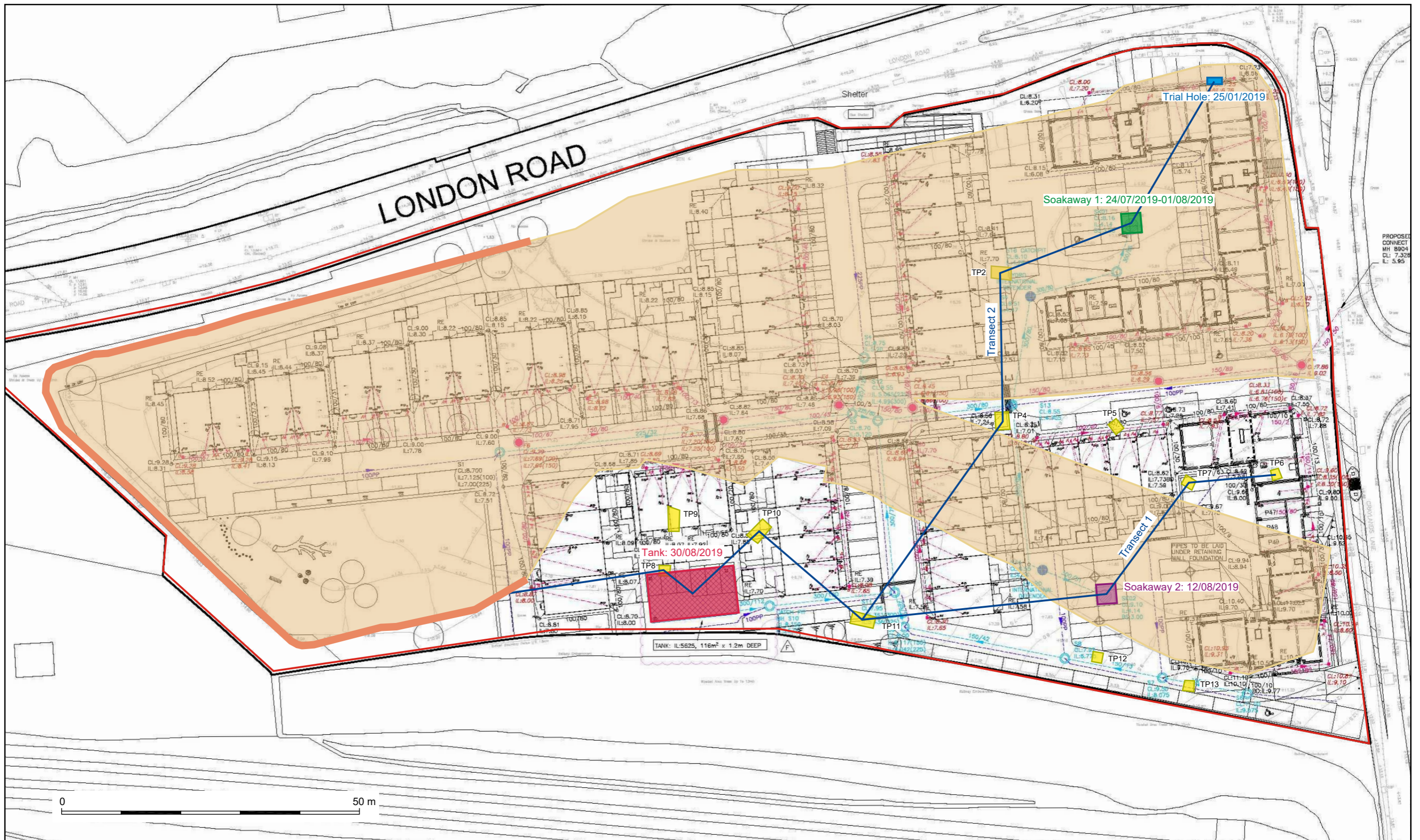
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Site location

Figure 1



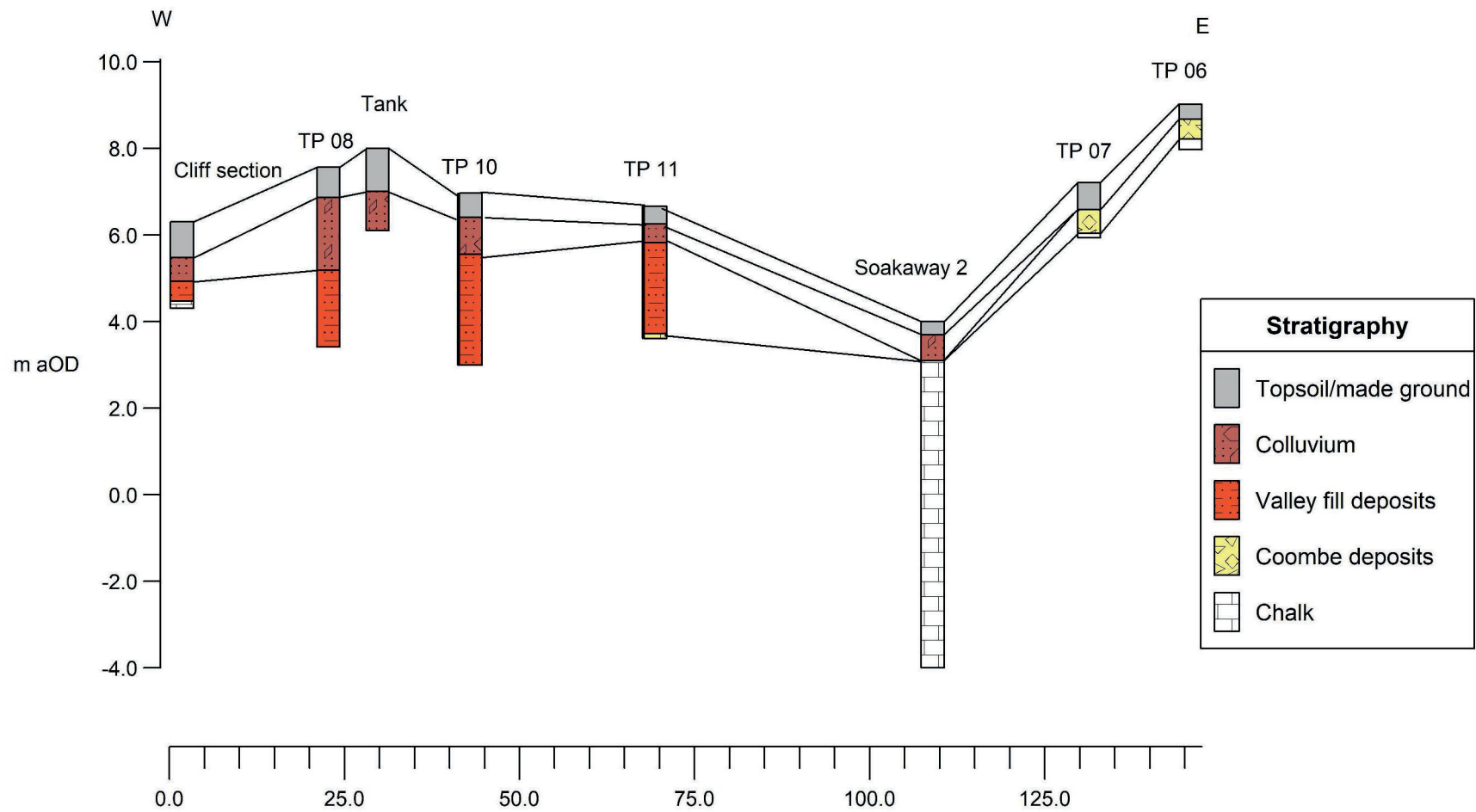
Coordinate system:
OSGB36 (OSTN15/OSGM15)



- Site boundary
- Quarried Area
- Cliff Face: 8-24/10/2018
- Soakaway 1: 24/07/2019-01/08/2019
- Soakaway 2: 12/08/2019
- Trial Hole: 25/01/2019
- Tank: 30/08/2019
- Previous test pit location
- Transect location

Site plan supplied by client.
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NGR Easting/Northing:

Tank; 559783.182, 174879.054
Soakaway 2; 559852.686, 174879.022

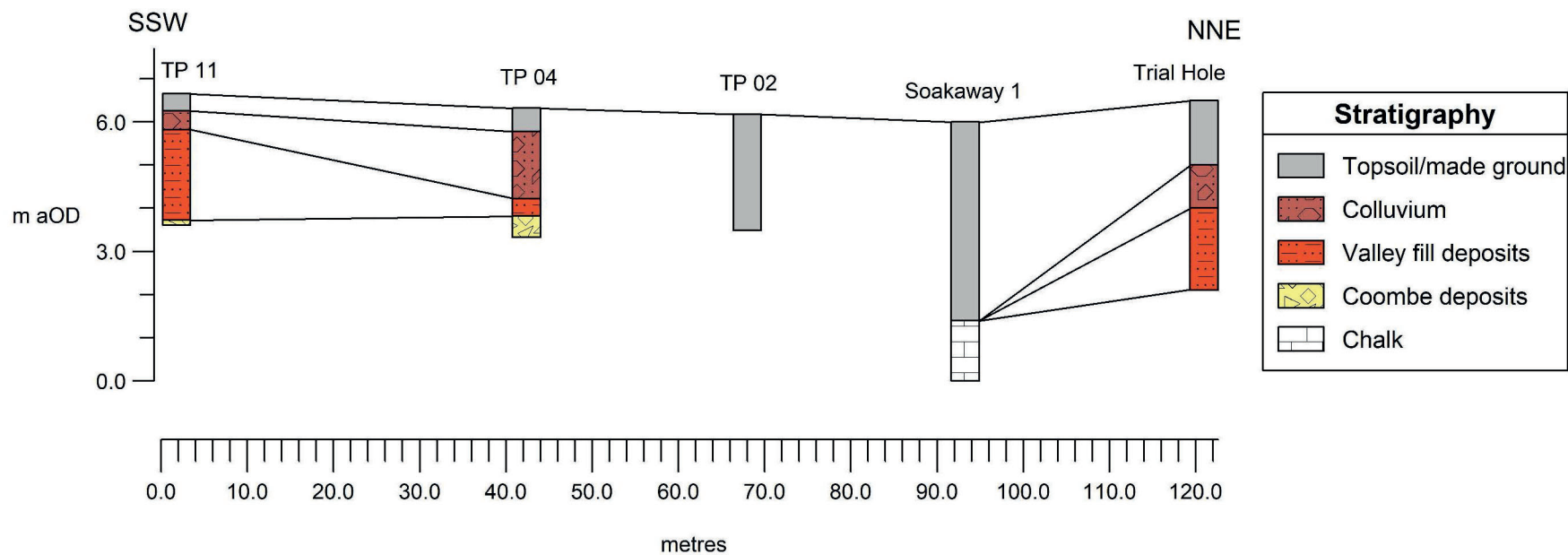
Date: 16/03/2020

Revision Number: 0

Scale: NTS at A4

Illustrator: KJF

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NGR Easting/Northing:

Trial Hole; 559870.840, 174965.200

Soakaway 1; 559856.885, 174941.308

Date: 16/03/2020

Revision Number: 0

Scale: NTS at A4

Illustrator: KJF

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Plate 1: Cliff Face



Plate 2: Trial Hole


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Plate 3: Tank Strip – Start of strip



Plate 4: Tank Strip – Section showing made ground


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Plate 5: Tank Strip – Near completed strip



Plate 6: Soakaway 1 – Initial Strip


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Plate 7: Soakaway 1 – Second strip



Plate 8: Soakaway 1 – Brick from Made Ground



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Plate 9: Soakaway 2 – Colluvium



Plate 10: Soakaway 2 – Made Ground

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