

Energy from Waste Facility, Eastern Creek

Aboriginal Heritage Test Excavation
Report

Report to Urbis
November 2014



 artefact

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EXECUTIVE SUMMARY

The Next Generation NSW (the Proponent), propose to develop an Energy from Waste (EFW) facility at Eastern Creek. The proposed EFW works will include the construction of an Electricity Generation Plant; with ancillary works related to the preparation and subsequent operation of the EFW. The works will be located within Lots 1 to 2 of DP1145808, in the Blacktown City Council Local Government Area (LGA). The subject site is bounded by the M4 Western Motorway, the Hanson Wallgrove Quarry, Transmission line easement and Archbold Road.

An Aboriginal Archaeological Technical Report (ATR) and Aboriginal Cultural Heritage Assessment Report (ACHAR) were prepared by Godden Mackay Logan (GML) in 2014 for the Eastern Creek EFT Facility Environmental Impact Statement (EIS). GML identified one area of moderate archaeological potential and two areas of high archaeological potential (2014a:40). However only one of these areas of archaeological potential will be directly impacted by the proposed works. The area is known as EFW South, and is located on an elevated area at the confluence of three waterlines in the southeast corner of the subject site. Therefore GML recommended that an archaeological test excavation to assess the nature, extent, condition and integrity of the site (2014a:49).

Artefact Heritage have been engaged by Urbis to complete the archaeological test excavation of Aboriginal site EFW South. The ATR report completed by GML (2014a) recommended that the test excavation be completed according to the *OEH Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (Code of Practice). As the project has been declared to be SSD by a State Environmental Planning Policy (SEPP); use of the Code of Practice is not required. However, the test excavation was completed in accordance with the Code of Practice; as a large number of previous archaeological test excavations in the region have been completed under the Code of Practice therefore it is an applicable framework to use for comparative analysis of archaeological findings. It also adheres to the recommendation provided by GML (2014a).

Test excavation at EFW South involved the excavation of thirty-seven 500 x 500 mm excavation units distributed in transects to sample the three areas of archaeological potential that make up the EFW South PAD. The excavation units consisted of thirty-three individual 500x500 mm test pits, and four 500x500 mm test pits combined to make up a 1x1 m test pit. In general, excavation units were based on a fifteen metre grid; however spacing between excavation units was altered in some areas, due to the presence of waterlines and vegetation. As the identification of EFW South as a PAD is based on the confluence of waterlines; the excavation unit locations targeted the raised areas of land in proximity to the confluence.

Test excavation of PAD site EFW South retrieved an assemblage of fourteen artefacts from nine of the thirty-seven 500x500 mm excavation units. The total area excavated 18.5m²; with an artefact density of 0.76 artefacts/m². The artefact assemblage was made up of stone artefacts composed entirely of silcrete (n=14, 100%); which ranged from orange to red in colour. Technological categories represented in the assemblage included: angular fragments (n=7, 50%), distal flakes (n=4, 29%), complete flakes (n=2, 14%) and a proximal flake (n=1, 7%). No tools, retouched artefacts or cores were noted in the assemblage. The assemblage is indicative of general stone reduction and casual discard. The artefacts identified during test excavation offer low research or educational value. All material recovered the same quality silcrete raw material and artefacts were waste flakes, with very little technical diversity.

The results reflect a mostly diffuse (slight concentration within north central portion of Area 2), low density artefact scatter which most likely reflect intermittent use of the area. While being located close to water sources, the area would be prone to flooding. There are higher slopes and crests in the nearby region that would be preferable camp sites; as they would offer a view of the terrain and drier camping place.

The test excavation results fit the predictive model based on information available in the local context on the distribution of artefacts in similar landscape settings. Previous surface and sub-surface archaeological investigations in the area identified high concentrations of artefacts adjacent to major waterlines in the area (Ropes Creek and Eastern Creek); with a drop in artefact density in the transitional land between them. The landscape located between the waterlines having mostly background scatter. The artefacts identified adhere to the local model; and are therefore common within the local context and have limited research potential.

The following recommendations were based on consideration of:

- Statutory requirements under the EP&A Act 1979.
- The requirements of the DGRs.
- The results of background research, archaeological test excavation and assessment.
- The likely impacts of the proposed development.
- The interests of Aboriginal stakeholders.

It was found that:

- EFW South is a low density artefact scatter – a site type that is common within a local and regional context on the Cumberland Plain is of low archaeological significance. The proposed EFW Facility will have a direct impact on site EFW South.

It is therefore recommended that:

- No further archaeological investigation of site EFW South is necessary as it is of low archaeological significance.
- The ACHAR prepared by GML would be updated outlining the results of the additional Aboriginal consultation, test excavations and proposed impacts to the significance of Aboriginal heritage values of all identified Aboriginal sites within the study area.
- The retrieved artefact assemblage should be reburied at a nearby location within the study area that will not be impacted by any future development works. Consultation regarding this will be conducted as part of the Aboriginal stakeholder review of the ACHAR. The reburial site would be determined through consultation with the proponent and the registered Aboriginal stakeholders. A site update card should be forwarded to the OEH AHIMS Registrar with information on the location and depth of reburial.
- An Aboriginal Site Impact Recording Form must be completed and submitted to the OEH AHIMS Registrar within four months of completion of the authorised development works.

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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

The Next Generation NSW (the Proponent), propose to develop an Energy from Waste (EFW) facility at Eastern Creek. The proposed EFW works will include the construction of an Electricity Generation Plant; with ancillary works related to the preparation and subsequent operation of the EFW. The works will be located within Lots 1 to 2 of DP1145808, in the Blacktown City Council Local Government Area (LGA). The subject site is bounded by the M4 Western Motorway, the Hanson Wallgrove Quarry, transmission line easement and Archbold Road (Figure 1)

An Aboriginal Archaeological Technical Report (ATR) and Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared by Godden Mackay Logan (GML) in 2014 for the Eastern Creek EFT Facility Environmental Impact Statement (EIS). GML identified one area of moderate archaeological potential and two areas of high archaeological potential (2014a:40). However, only one of these areas of archaeological potential will be directly impacted by the proposed works. The area is known as EFW South, and is located on an elevated area at the confluence of three waterlines in the southeast corner of the subject site (Figure 2). Therefore GML recommended that an archaeological test excavation was required to assess the nature, extent, condition and integrity of the site (2014a:49).

Following the preparation of test excavation methodology (Artefact 2014) for EFW South, archaeological test excavation was conducted over a period of four days at the proposed EFW Facility. This report outlines the results of archaeological investigations.

1.2 Proposed Development

The proposed development involves the construction and operation of an Electricity Generation Plant. The proposal will result in NSW's largest Energy from Waste Plant using as fuel, residual waste which would otherwise be land filled, to allow for a 'green' electricity generation facility. The plant, powered by burning non-recyclable combustible waste material, will have a capacity for up to 1.35 million tonnes of waste material.

Further to the EFW Facility, the proposal includes the adoption of a plan of subdivision (Figure 3) and the following ancillary works:

- Earthworks associated with the balance of the site;
- Internal roadways;
- Provision of a direct underpass connection (Precast Arch and Conveyor Culvert) between TNG Facility and the Genesis Xero Waste Facility;
- Staff amenities and ablutions;
- Staff car parking facilities;
- Water detention and treatment basins; and
- Services (Sewerage, Water Supply, Communications, Power Supply).

1.3 Investigators and Contributors

Alexander Timms, Archaeologist at Artefact Heritage, prepared this report with management input from Principal Archaeologist Dr Sandra Wallace.

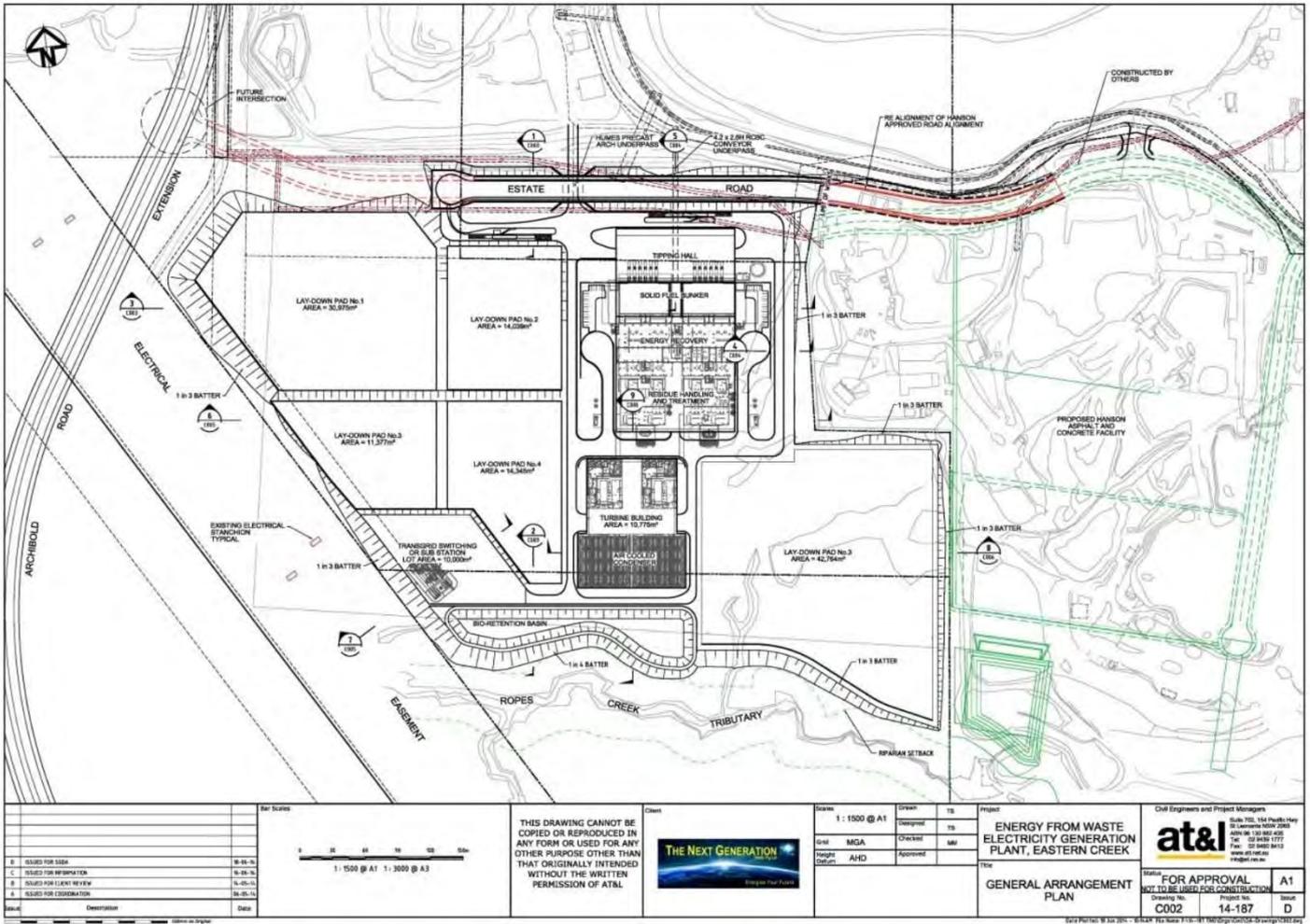
Figure 1: General location of study area



Figure 2: Areas of archaeological potential as identified by GML (2014a)



Figure 3: Energy from Waste proposed works location of subject site (from EIS 2014)



2.0 LEGISLATIVE CONTEXT

National Parks and Wildlife Act (1974) (NPW Act)

The NPW Act, administered by the OEH provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the Act, and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community) under Section 84.

The protection provided to Aboriginal objects applies irrespective of the level of their significance or issues of land tenure. However, areas are only gazetted as Aboriginal Places if the Minister is satisfied that sufficient evidence exists to demonstrate that the location was and/or is, of special significance to Aboriginal culture.

The NPW Act was amended in 2010 and as a result the legislative structure for seeking permission to impact on heritage items has changed. A Section 90 permit is now the only Aboriginal Heritage Impact Permit (AHIP) available and is granted by the OEH. Various factors are considered by OEH in the AHIP application process, such as site significance, Aboriginal consultation requirements, ESD principles, project justification and consideration of alternatives. The penalties and fines for damaging or defacing an Aboriginal object have also increased.

As this project is being assessed under Part 4 Division 4.1 of the EP&A Act 1979 permits issued under the NPW Act 1974 are not required.

Environmental Planning & Assessment Act (1979) (EP&A Act)

The proposal will be assessed under Part 4, Division 4.1 of the EP&A Act, which establishes an assessment and approval regime for State Significant Development (SSD). Part 4, Division 4.1 applies to development that is declared to be SSD by a State Environmental Planning Policy (SEPP). Section 89J of the EP&A Act specifies that approvals or permits under section 90 of the NPW Act 1974 are not required for approved SSD. However the ATR (GML 2014a) recommended that the test excavation be completed according to the OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*.

3.0 ABORIGINAL CONSULTATION

Aboriginal stakeholder consultation for the Eastern Creek EFW facility project was commenced by GML on behalf of The Next Generation NSW (the proponent). Consultation was conducted in accordance with the Department of Environment and Conservation (now OEH) *Aboriginal cultural heritage consultation requirements for proponents 2010*. Twelve Aboriginal stakeholders have registered for consultation throughout the project, including:

- Darug Land Observations (DLO)
- Tocomwall
- Darug Aboriginal Cultural Heritage Assessments (DACHA)
- Koomurri Ngunawal Aboriginal Corporation (KNAC)
- HSB Heritage Consultants (HHC)
- Wurrumay Consultants
- Darug Aboriginal Landcare (DALC)
- Darug Tribal Aboriginal Corporation (DTAC)
- Deerubbin Local Aboriginal Land Council (DLALC)
- Kamilaroi-Yankuntjatjara Working Group (KYWC)
- Gunjeewong Cultural Heritage Aboriginal Corporation (GCHAC)
- Darug Custodian Aboriginal Corporation (DCAC)

A consultation log is maintained detailing correspondence with the Aboriginal stakeholder groups. For the full consultation log maintained by GML see the ACHAR (GML 2014b).

The Test Excavation Methodology was sent by Artefact Heritage to all registered Aboriginal stakeholders for comment on 8 October 2014. No comments on the methodology were forthcoming from any of the registered stakeholders.

Test excavation was conducted over four days from Monday 3 November to Thursday 6 November 2014. For a list of participants please refer to Section 6.1.

4.0 BACKGROUND CONTEXT

4.1 Environmental Context

The study area is located on the undulating floodplain between Ropes Creek (450 metres to the west) and Eastern Creek (2.7 kilometres to the east). The study area is made up of low elevation undulating land, with a slight ridge in the running north-south through the southeast portion of the study area. There are also a number of gentle slopes in the northwest and north portions of the study area, associated with low hills outside of the study area. To the west the terrain flattens out towards the floodplain. Overall, the landform units within the study area range from alluvial flats, to gentle ridges, slopes and gullies.

The underlying geology of the study area consists of late Triassic period Bringelly shale deposits; which consists of shale, claystone, laminate, lithic sandstone, rare coal and tuff (Clark and Jones 1991). The study area is within the Blacktown soil landscape; which generally consists of shallow duplex soils over a clay base.

4.2 Sub-surface Archaeological Investigation in the Local Area

Dominic Steele (2003) conducted test excavations across the proposed Wonderland Business Park; located approximately 1.5 kilometres to the east of the current study area. Excavations comprised a total of twenty 1x1 metre test pits arranged in two main transects that sampled a number of landforms; including a minor hill crest, slopes and creek flats of a small Eastern Creek tributary. The archaeological assessment identified a high ratio of surface to subsurface artefacts; as thirty surface artefacts were identified and only five artefacts were identified during subsurface testing. Only eight of the artefacts were identified as having diagnostic attributes of the reduction sequence, with the rest consisting of the assemblage being fragmented by post depositional effects causing breaking and shattering (Steele 2003:42). The dominant raw material identified was silcrete (77.5%) followed by quartz (10%) and tuff (7.5%). A potential ground axe and pebble fragment were also identified, manufactured from volcanic material. Steele (2003) concluded that the assemblage consisted of background scatter, related to sporadic landuse of Aboriginal people moving between the two principle creek lines in the area, being Ropes Creek and Eastern Creek.

Jo MacDonald CHM (2006) completed archaeological test excavations at the Wonderland Surplus Land, which is the adjacent property to the east of the current study area. Two PAD sites, identified by an earlier study (JMcD 2006), were targeted under the subsurface testing programme; including EC3/1 and EC3/2. The PAD sites covered a low ridge top (EC3/2) and hill slope (EC3/1). Testing methodology involved dispersed 1x1 metre test pits placed across the PADs; with areas of concentrated artefact density being extended into open area excavations. The open area excavation at EC3/1 covered 121m² and 151m² at EC3/2. A total of 1550 lithic artefacts were identified during excavations; mostly from silcrete material, with some tuff and quartz. Evidence from EC3/1 suggested a low density (0.8 artefacts per m²), often discontinuous scatter. Artefact conjoining also demonstrated spatial displacement downslope. The excavations at EC3/2 revealed the site was evenly dispersed and fairly low density (0.8 artefacts per m²). Artefact conjoining showed some displacement in the assemblage. It was concluded that EC3/1 represented an area that went intermittent occupation and EC/2 was a possible lookout point.

Biosis (2010) undertook test excavations for the proposed Erskine Park Link Road Project that connects Old Wallgrove Road to Erskine Park Road. The proposed link road runs 700 metres to the south of the current study area. Biosis completed test excavation of three Aboriginal sites within the proposed road route (AHIMS 45-5-3843, 45-5-3842, 45-5-3062), under AHIP 1113179. Excavations identified subsurface artefacts in all excavated sites. A total of 352 artefacts were identified during test

excavations. A majority of artefacts were identified at the PAD site located on the banks of Ropes Creek (n=341), while the density dropped within the two remaining sites located further from the creek line. The raw material of identified artefacts was mainly red and yellow silcrete, with a few quartz artefacts. Two potential artefacts manufactured from ceramic electricity insulators were also identified with the Ropes Creek PAD, suggesting contact period occupation of the Ropes Creek area.

KNC (2011) completed archaeological test excavations at the Australand Eastern Creek Employment Lands; located approximately 420 metres to the east of the current study area. The excavations were recommended by a Heritage Conservation Strategy (JMcD CHM 2004) for the area. The Heritage Conservation Strategy had identified areas of low, moderate and high archaeological potential, based on landform, within the Australand holding. The Strategy recommended that areas of high archaeological potential be subject to salvage excavation and a representative sample of landscapes with the area identified as moderate archaeological potential. The KNC excavations focused on two sites; AEC1, was positioned on both flat and sloping land and AEC2 was positioned on a ridgeline and crest landform. A total of thirty-nine 1x1metre test pits were excavated at both AEC1 and AEC2. The stratigraphy on the north side of the site consisted of moderate brown clayey loam, over a red/brown very dry (sometimes cracked) clay base at an average depth of 20 millimetres. In the south portion of AEC1, the stratigraphy consisted of dark brown silty topsoil, overlying firm brown silty loam, with a base of dark orange clay at an average depth of 60 millimetres. The absence of A horizon soils on the north side of AEC1 was concluded to be the result of prior ground disturbance. Excavations at AEC2 identified a relatively uniform stratigraphy across the site consisting of dark brown clayey loam with a diffuse interface into basal clay. A total of ten flaked artefacts were identified during the excavations; seven at AEC1 and three from AEC2. The calculated artefact density was 0.25 artefacts per square metre. Artefacts were generally identified on down slopes associated with elevated flat areas. Silcrete was the dominant raw material type (60%), followed quartz (20%), mudstone (10%) and siliceous tuff (10%). It was concluded that the low density of artefacts identified were the result of the majority the area being located of areas of moderate archaeological potential, with only a small portion of high potential within the property. However, the results also adhered to the stream order theory in regards to artefact density of the Cumberland Plain, as well as supporting the intermittent land use between Ropes and Eastern Creeks as discussed by Steele (2003).

4.3 Discussion of EFW Facility Assessment by GML 2014

GML completed an ATR (2014a) and subsequent ACHAR (2014b) for the proposed Eastern Creek EFT Facility; which is the current scope of works being assessed by the test excavation. The survey completed as part of this assessment identified three new sites. The first site was Archbold Road 1, located in the north portion of the study area; which comprised three previously recorded sites that had not been registered with AHIMS (Brayshaw and Haglund 1996, JMcD 2002). During the survey GML identified three surface artefacts and large PAD with a high archaeological potential (2014a:35). The location of this site is shown in Figure 2.

The second site was Archbold Road 2, was located in the northwest portion of the study area. During the survey three surface artefacts were identified, and it was believed that the area was a large PAD with a moderate archaeological potential (2014a:36). The location of this site is shown in Figure 2.

The third site was EFW South, was located in the southeast portion of the study area. The area had previously been identified as being an area of high archaeological potential (JMcD 2002 and JMcD 2005). During the survey two surface artefacts were identified, and it was believed that the area was a large PAD with a high archaeological potential (2014a:36-37). The archaeological test excavation of this site is the current focus of this document. The location of this site is shown in Figure 2.

5.0 AIMS OF ARCHAEOLOGICAL TEST EXCAVATION

The investigation of the EFW South PAD within the study area provides a representative sample of a sensitive landform and presents the opportunity to add to the corpus of archaeological information for the region. Areas of PAD that will be investigated in accordance with this test excavation methodology includes the portions of raised land surrounding the confluence of two first order waterlines into a second order waterline which runs into Ropes Creek to the west. The raised areas around these waterlines consist of a gentle gradient down to the south; however there is a diverse micro-topography within this gently inclined slope. The micro-topography consists a shallow waterline basin, very low rises and slopes and some slightly raised flat areas. Therefore the methodology will aim to investigate the subsurface potential of all elements of the micro-topography.

Previous surface and sub-surface archaeological investigations in the area have identified some particularly high concentrations of artefacts in areas adjacent major waterlines in the area (Ropes Creek and Eastern Creek); with a noted drop in artefact density in the transitional land between them. The landscape located between the waterlines having mostly background scatter, with noted increase in elevated slopes and crests around first and second order streams that run off the major waterlines. Archaeological test excavation as outlined in this methodology will further investigate the distribution of Aboriginal objects in sub-surface contexts across the project area and provide more information on Aboriginal land use patterns.

In accordance with the OEH code of practice, the aims of archaeological test excavation are:

- To adequately identify the extent of EFW South.
- To assess the scientific significance of EFW South following an assessment of test excavation results.
- To provide an opportunity for registered Aboriginal stakeholders to comment on the Aboriginal cultural heritage values of the site.
- To provide the proponent with recommendations on opportunities to avoid impact and future requirements for further archaeological investigation where required.

6.0 EXCAVATION METHODOLOGY

Archaeological test excavation was conducted in accordance with the test excavation methodology (Artefact 2014).

The ATR report completed by GML (2014a) recommended that the test excavation be completed according to the OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (Code of Practice). As the project has been declared to be SSD by a State Environmental Planning Policy (SEPP); it is not required to use the Code of Practice. However the test excavation methodology was completed in accordance with the Code of Practice, as per the recommendations of GML (2014a). As a large number of previous archaeological test excavations in the region have been completed under the Code of Practice, therefore it is an applicable framework to use for comparative analysis of archaeological findings within the current test excavation.

6.1 Dates and Personnel

Test excavation was conducted over four days between Monday 3 and Thursday 6 November 2014. A number of representatives from the registered Aboriginal parties and five archaeologists from Artefact Heritage took part in the test excavation program. A full list of personnel is outlined in Table 1 below.

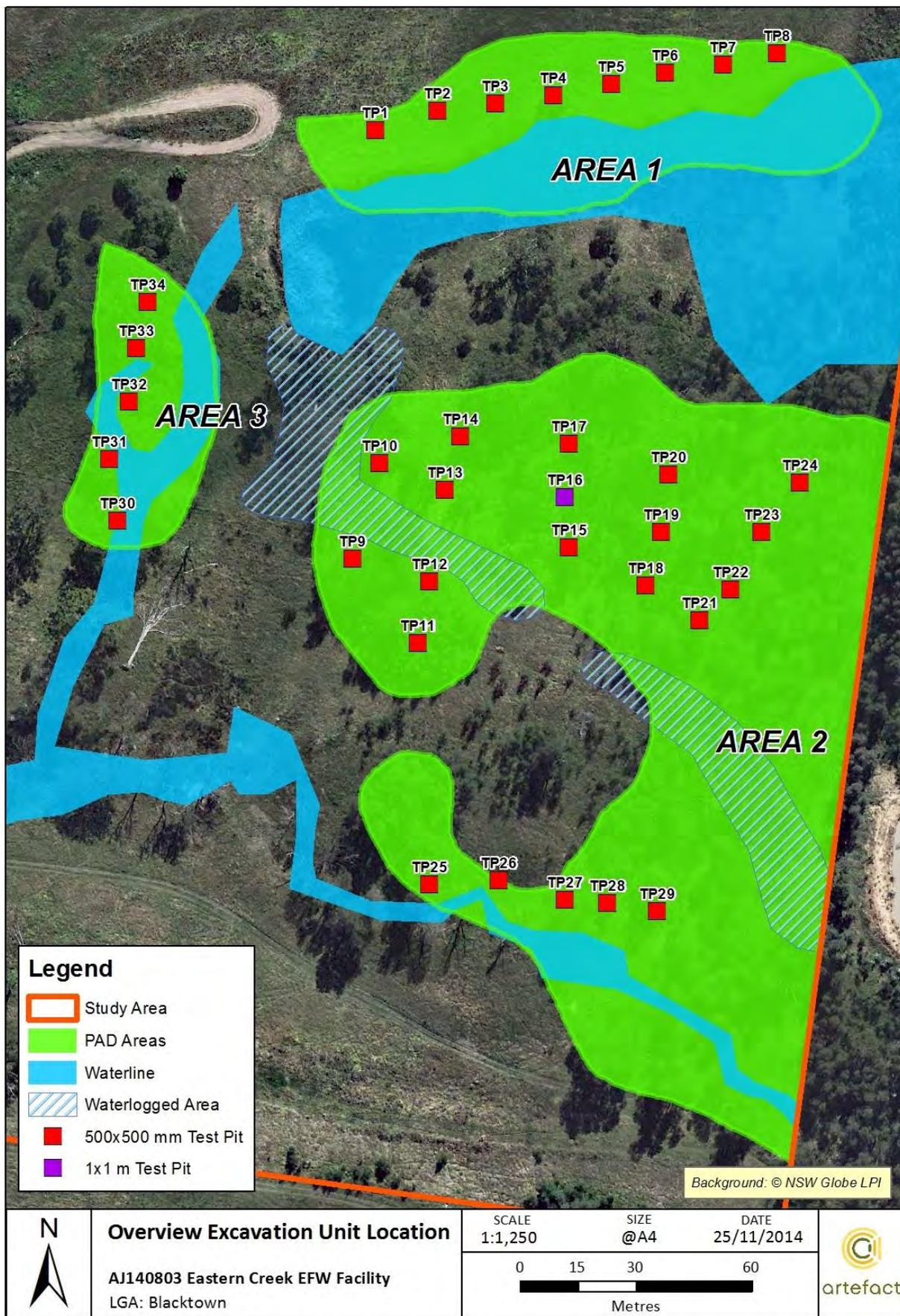
Table 1: Test excavation personnel

Representative	Organisation
Patricia Hampton	HSB Heritage Consultants
Tyler West	HSB Heritage Consultants
David Mason	Darug Aboriginal Landcare
Michael Lester	Tocomwall
Dennis Hardy	Darug Aboriginal Cultural Heritage Assessments
Josh Symons	Artefact Heritage
Alexander Timms	Artefact Heritage
Sylvia Daly	Artefact Heritage
Zvonka Stanin	Artefact Heritage
Christian Fielder	Artefact Heritage

6.2 Trench Layout and Excavation Units

Test excavation at EFW South involved the excavation of thirty-seven 500 x 500 mm excavation units distributed in transects to sample the three areas of archaeological potential that make up the EFW South PAD (Figure 4). The excavation units consisted of thirty-three individual 500x500 mm test pits, and four 500x500 mm test pits combined to make up a 1x1 m test pit (Figure 4). In general, excavation units were based on a fifteen metre grid; however spacing between excavation units was altered in some areas, due to the presence of waterlines and vegetation. As the identification of EFW South as a PAD is based on the confluence of waterlines; the proposed excavation unit locations targeted the raised areas of land in proximity to the confluence (Figure 4). During the time of excavation, the main tributary from Eastern Creek contained water. The waterline in Area 1 has been modified on the western end, to help retain water. The waterline that runs through Area 3 was dry.

Figure 4: Excavation Layout



6.3 Excavation procedure

Transects and excavation squares would be laid out using long hand-tapes, flags and pegs. An initial baseline would be laid out at each location, and trigonometry used to lay out parallel transects and offset excavation squares. A flag and peg would be placed at each point to be tested, and hand tapes and pegs used to lay out the remaining pegs at each corner of the excavation units. A datum would be established at the first excavation unit on the baseline. The location of each excavation unit would be recorded using a hand-held non-differential GPS, and the magnetic bearing of the first transect recorded using a compass.

In accordance with the OEH Code of Practice, the initial excavation unit at each location would be excavated in 5 centimetre spits. Subsequent excavation units will be excavated in 10 centimetre spits to the base of the artefact bearing deposit (with the exception of deposits deeper than 1.5 metres).

A context sheet for each excavation unit would be completed in the field. Details recorded will include date of excavation, name of excavators, depth, number of buckets and soil description. Additionally, one representative section wall from each excavation unit will be scale drawn, and photographs will be recorded of each section wall and base.

All retrieved deposit from each excavation unit would be placed in buckets and transported to a sieve area using wheelbarrows. All retrieved deposit would be sieved using nested 5 mm and 3 mm sieves.

6.4 Excavation recording

A recording form was completed for each excavation unit. The recording form provided space to document details of each spit, including spit number, start and end levels, number of buckets taken to the sieves, soil description, bioturbation, and any artefacts observed during excavation. Copies of all recording forms are attached in Appendix A.

A paper label including details of site name, date, excavation unit grid location, excavator name/s and spit number, was completed for each spit and placed into a small re-sealable bag. That bag was placed into a larger re-sealable bag transcribed with the same provenance details in permanent marker. The re-sealable bags were transported to the sieve area in one of the buckets containing excavated soil. Any artefacts retrieved during sieving were placed into the re-sealable bag.

A photographic record was maintained for each section wall and base of every excavation unit, and one section drawing was completed of a representative section wall within each excavation unit.

6.5 Artefact Recording

All Aboriginal objects retrieved during excavation or sieving were placed into a re-sealable bag with provenance details. Records of artefact numbers and preliminary details of artefact type were maintained throughout the course of the excavation. The specific attributes recorded were chosen to fulfil the aims of test excavation, and to provide a comparable dataset to other artefact assemblages in the region. Recorded attributes are outlined in Table 2.

Table 2: Recorded artefact attributes

Artefact attributes	Recorded details
Site Details	Provenance details.
Excavation Unit	Test pit number.
Spit	Spit number and spit depth.
Raw material	Raw material type and colour. Examples of raw material types include: silcrete, mudstone, quartz, petrified wood, glass and hornfels.
Reduction type	Flake; proximal flake fragment; medial flake fragment; distal flake fragment; bipolar flake; split flake (L or R); angular fragment; crenate fracture.
Tool / core type	Backed; retouched; core – unifacial, unifacial rotated, bifacial; core fragment.
Size range	Maximum dimension in the following categories – 0-5 mm, 6-10 mm, 11-15 mm, 16-20 mm, 21-30 mm, 31-40 mm, 41-50 mm.
Flake dimensions	Oriented length, width and thickness of complete flakes.
Cortex	Cortex coverage of whole artefact, including: none; 1-32%; 33-66%; 67-99%; 100%.

7.0 RESULTS

7.1 Excavation Unit Characteristics

A total of thirty-seven 500x500 mm test pits were excavated across the EFW South PAD. The excavation units consisted of thirty-three individual 500x500 mm test pits, and four 500x500 mm test pits combined to make up a 1x1 m test pit.

A description of soil deposits encountered, number of artefacts, their nature and extent are detailed below.

7.1.1 Spit Depth

The first test pit excavated in each of the three areas of the EFW South PAD were excavated in 50 mm spits. As the soil profile was consistent across the remaining excavation units for each area, all subsequent test pits were excavated in 100 mm increments.

The first test pit in Area 1 (TP1) was excavated in three 50 mm spits down to depth of 150 mm. The remaining seven test pits in Area 1 were excavated in 100 mm spits, down to an average depth of 137 mm.

The first test pit in Area 2 (TP9) was excavated in four 50 mm spits down to depth of 160 mm. The remaining seven test pits in Area 1 were excavated in 100 mm spits, down to an average depth of 187 mm.

The first test pit in Area 3 (TP30) was excavated in four 50 mm spits down to depth of 200 mm. The remaining seven test pits in Area 1 were excavated in 100 mm spits, down to an average depth of 107 mm.

7.1.2 Soil Description

The soil profile encountered within the test area was generally consistent. A detailed description of one excavation unit for each area is provided as a representative sample below. The remaining excavation units are summarised in Appendix A.

7.1.2.1 Area 1

The soil profile encountered within the northern portion of EFW South (Area 1) was consistent across the area, comprising brown silty loam with grass roots (A1 horizon) and occasional small stone inclusions. The A Horizon in turn overlay a B Horizon of dense orange-brown clay. The boundary between the A and B Horizons was not always sharp and even, with some mixing evident. A typical pit displaying the soil profile encountered across the Area 1 is described below (see Table 3 and Figure 5 to Figure 7). The location of all excavation units within Area 1 are shown in

Table 3: TP3 soil description

Context	Depth (mm)	Soil Description
1	0 - 100	A Horizon: Dry, medium grain, moderate compaction, brown silty loam. Inclusions of grass roots and occasional small stones.
2	100 - 160	B Horizon: Dry, medium grain, very hard compaction, brown and orange mottled clay. Sterile basal layer.

Figure 5: North wall of TP3



Figure 6: Context of TP3



Figure 7: North section of TP3

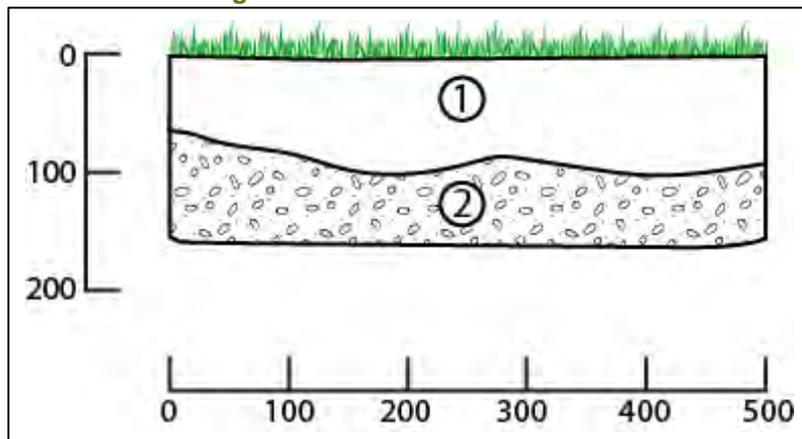
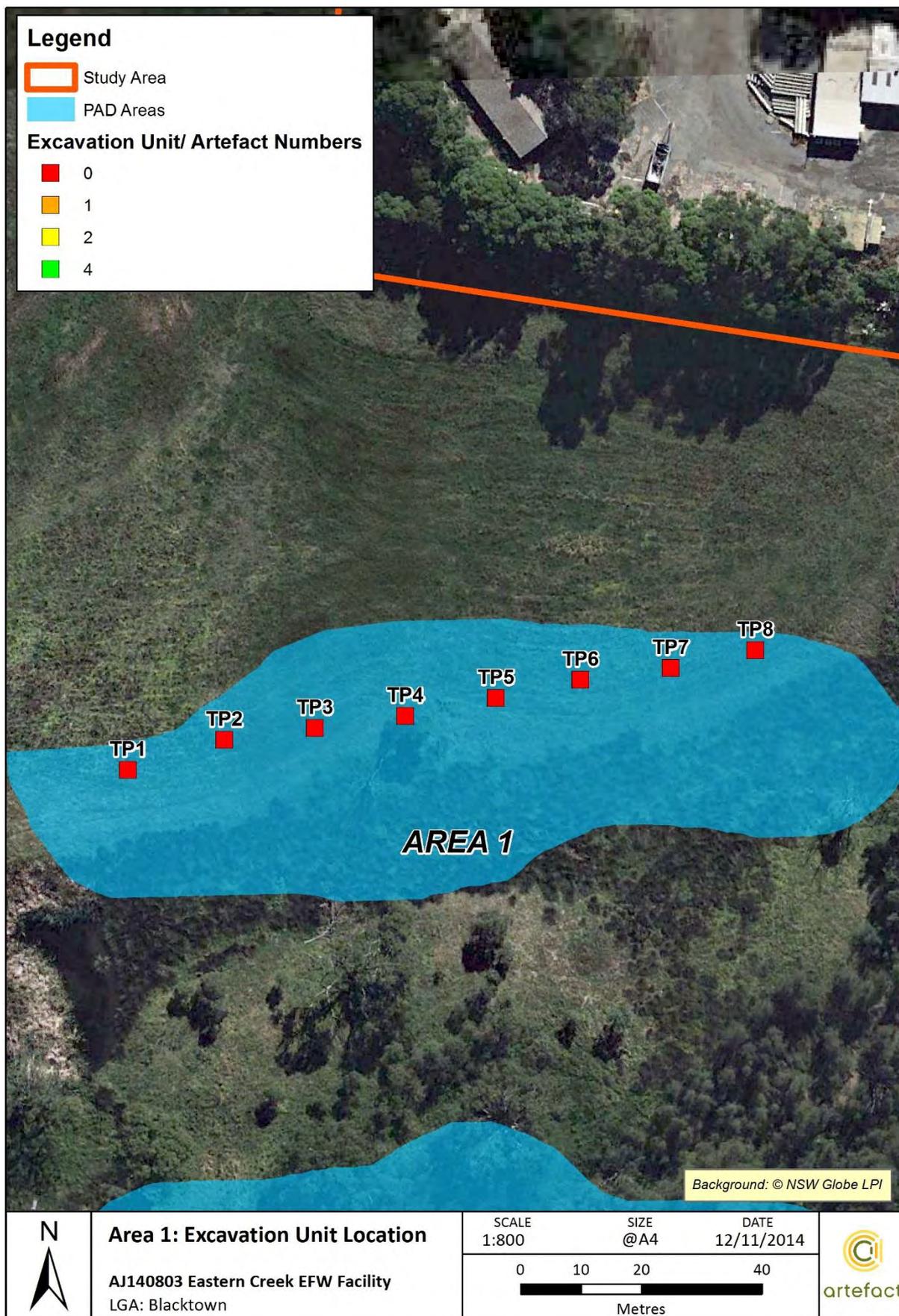


Figure 8: Area 1 - Excavation results



7.1.2.2 Area 2

The soil profile encountered within the central and southern portion of EFW South (Area 2) was relatively consistent across the area. The majority of test pits (TP9 to TP24) comprised grey brown silty loam with grass roots (A1 horizon) and occasional small stone inclusions. From the A horizon, there was a gradual change into a brown silty clay with minor orange mottling. A typical pit (TP16) displaying the soil profile encountered across the Area 2 is described below (see Table 4 and Figure 9 to Figure 11). Four artefacts were encountered in TP16, therefore the excavation unit was opened up into 100 x 100 cm area.

Soils within the southern portion of Area 3 (TP25 to TP29), tended to be deeper and waterlogged with increase clay content in the upper contexts; which is most likely due to their proximity to the waterline (Figure 4 and Figure 12).

Table 4: TP16 soil description

Context	Depth (mm)	Soil Description
1	0 - 100	A Horizon: Dry, medium grain, moderate compaction, grey brown silty loam. Inclusions of grass roots and occasional small stones.
2	100 - 160	B Horizon: Gradual change into dry, medium grain, very hard compaction, light brown and orange mottled silty clay. Sterile basal layer.

Figure 9: North wall of TP16



Figure 10: Context of TP16



Figure 11: North section of TP16

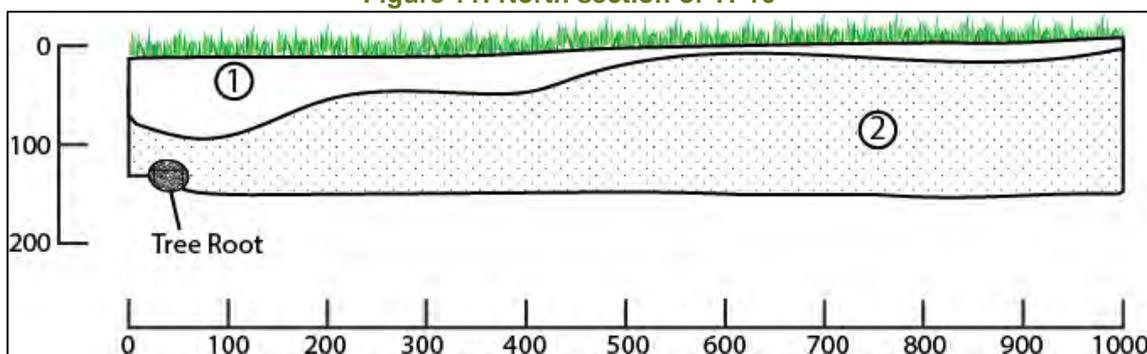
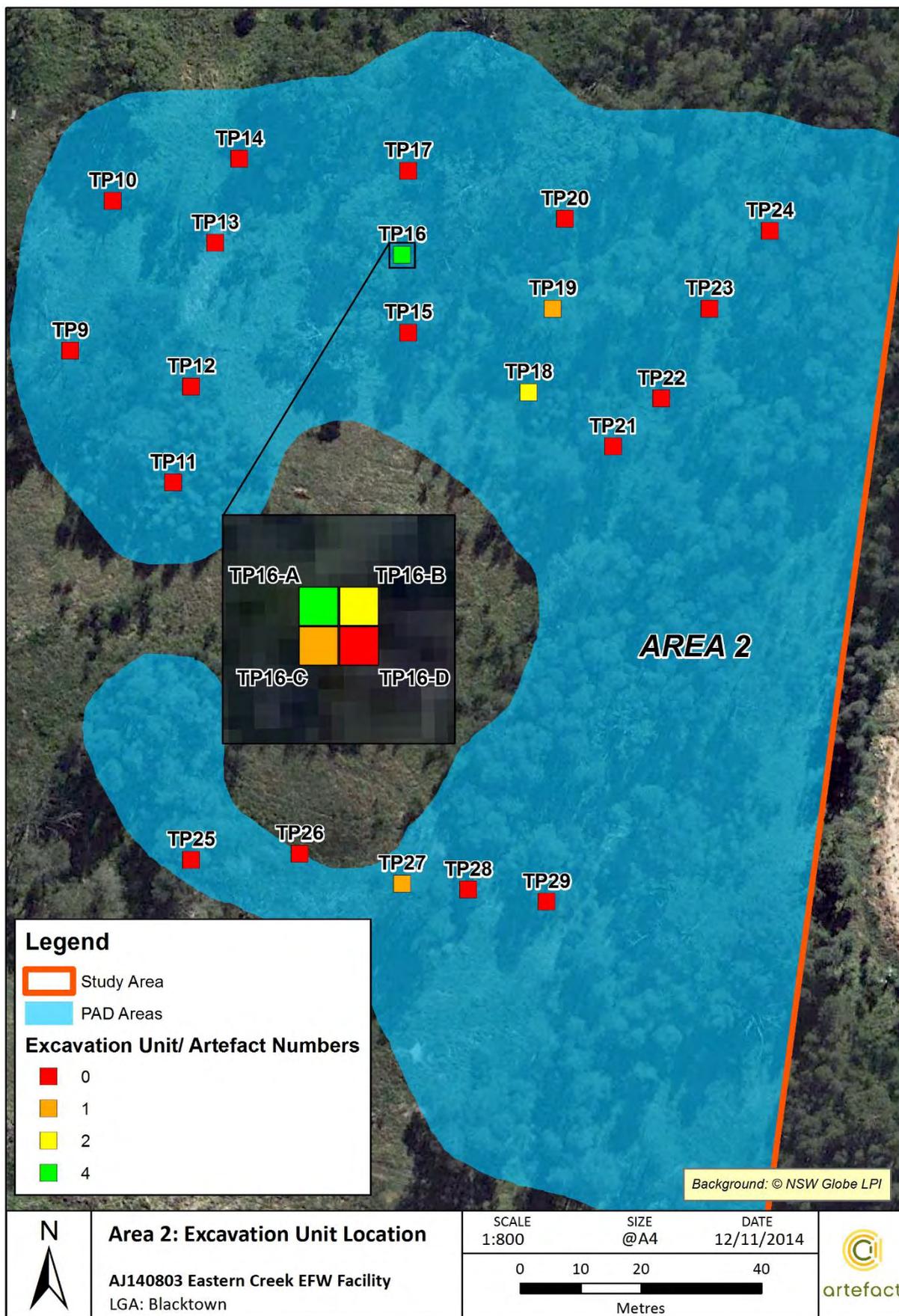


Figure 12: Area 2 - Excavation results



7.1.2.3 Area 3

The soil profile encountered within the central and southern portion of EFW South (Area 3) was consistent across the area. All test pits (TP30 to TP34) comprised very compact grey brown silty loam with grass roots (A1 horizon) and occasional small stone inclusions. The A horizon soils were very compact in this area; which has most likely been caused by excessive cattle movement within this portion of EFW South. From the compacted A horizon, there was a gradual change into a brown silty clay with minor orange mottling. A typical pit (TP30) displaying the soil profile encountered across the Area 3 is described below (see Table 5 and Figure 13 to Figure 15). The location of excavation units within Area 3 are shown in Figure 16.

Table 5: TP30 soil description

Context	Depth (mm)	Soil Description
1	0 - 60	A Horizon: Dry, medium grain, hard compaction, grey brown silty loam. Inclusions of grass roots and occasional small stones.
2	60 - 200	B Horizon: Gradual change into dry, medium grain, very hard compaction, light brown and orange mottled silty clay. Sterile basal layer.

Figure 13: West wall of TP30



Figure 14: Context of TP30



Figure 15: North section of TP30

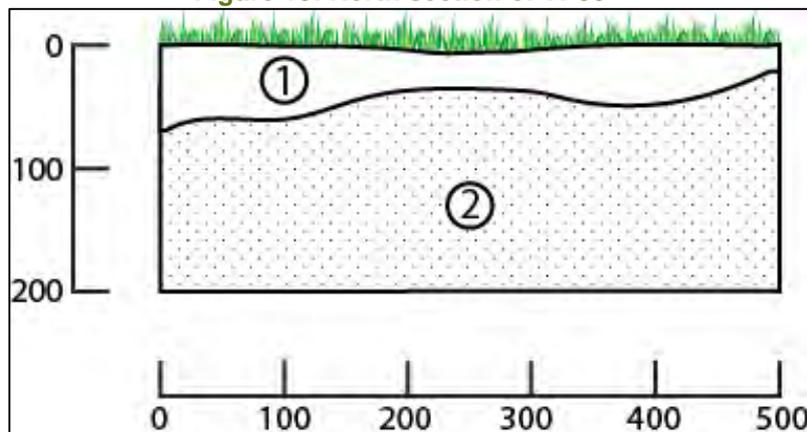
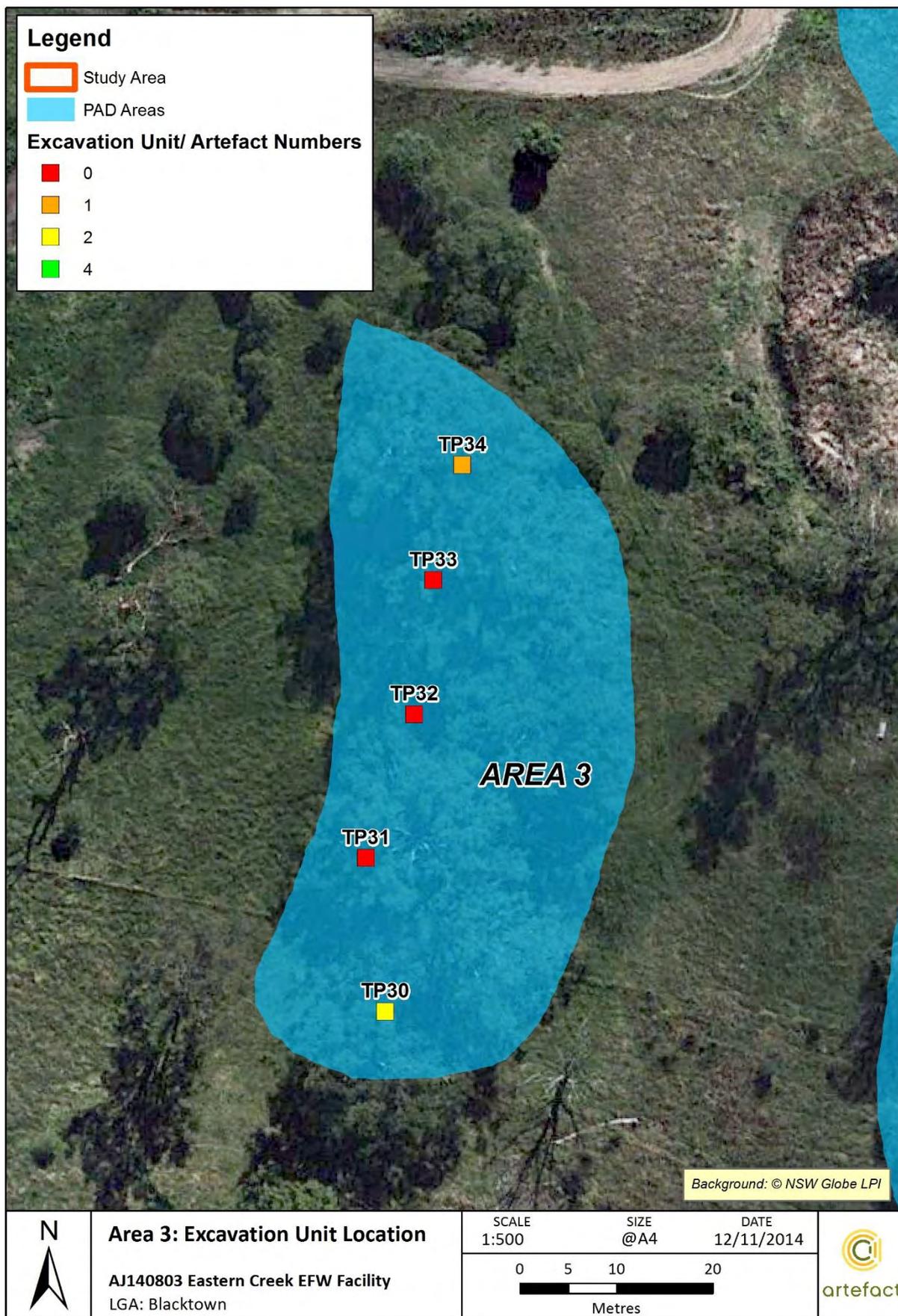


Figure 16: Area 3 - Excavation results



7.1.3 Levels of Disturbance

The area was nominated as a PAD due to the identification of two surface lithic artefacts, proximity to waterlines and evident integrity of the ground disturbance (GML 2014a:36-38). There is visual evidence of isolated portions of ground disturbance within the general area; however the test excavation did not enter these areas.

The results of the excavation show a consistent silt A horizon overlying a clay or silty clay B horizon. The stratigraphy often had a gradual change; however this is due to natural taphonomic processes, not ground disturbance. No European rubbish was encountered in any of the excavation units (i.e. glass, metal or ceramic pieces). Therefore the soil integrity of the area tested appears to be moderate. There is some evidence of fluvial erosion. Also, there is some bioturbation; mostly caused by Cattle and Kangaroos that frequent the area. However these disturbances are considered minor.

7.2 Stone Artefact Analysis

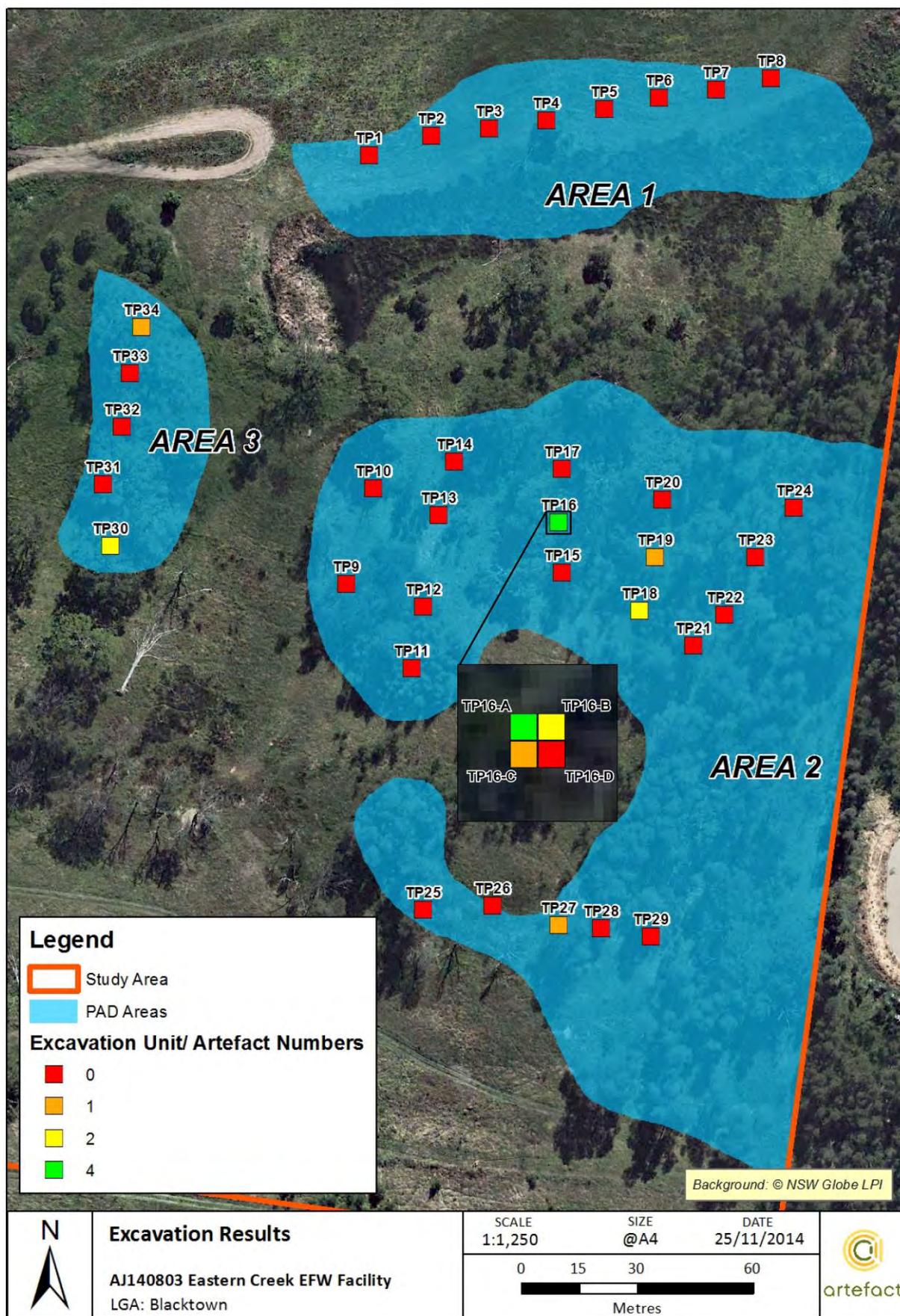
7.2.1 Stone artefact distribution and density

Test excavation of PAD site EFW South retrieved an assemblage of fourteen artefacts (Figure 18) from nine of the thirty-seven 500x500 mm excavation units (Figure 17). The total area excavated 18.5m²; with an artefact density of 0.76 artefacts/m².

The location of artefacts indicates a sparse scatter across the majority of the site area, with a concentration of ten artefacts within the north central portion of Area 3 (TP16-A, TP16-B, TP16-C, TP18 and TP19). The highest number of artefacts were found in TP16-A; therefore the excavation unit was extended into a 1x1 m test pit, using three more 500x500 mm test pits (TP16-B, TP16-C, TP16-C (Figure 17). However the artefact numbers decreased in the additional test pits. Additional artefacts identified in TP18 and TP19 showed that there was a concentration in the area. An additional transect was excavated to the east of these artefact bearing excavation units to investigate the potential continuance of the concentration (TP21 to TP24). However, no artefacts were identified in the additional pits; which successfully established an extent for the artefact concentration.

One more artefact was identified in the south portion of Area 2 (TP27) and a further three artefacts in Area 3 (TP30 and TP34), demonstrating that the pattern of artefact distribution across this portion of the site reflected isolated scatters /isolated artefacts rather than a continuous scatter. However as all artefacts were identified on slightly raised areas adjacent ephemeral waterlines, they are considered to part of the same site (EFW South).

Figure 17: Distribution of Artefacts Retrieved During Excavation



7.2.2 Raw material and artefact characteristics

The artefact assemblage was made up of stone artefacts composed entirely of silcrete (n=14, 100%); which ranged from orange to red in colour.

Technological categories represented in the assemblage included: angular fragments (n=7, 50%), distal flakes (n=4, 29%), complete flakes (n=2, 14%) and a proximal flake (n=1, 7%).

No tools, retouched artefacts or cores were noted in the assemblage. The assemblage is indicative of general stone reduction and casual discard.

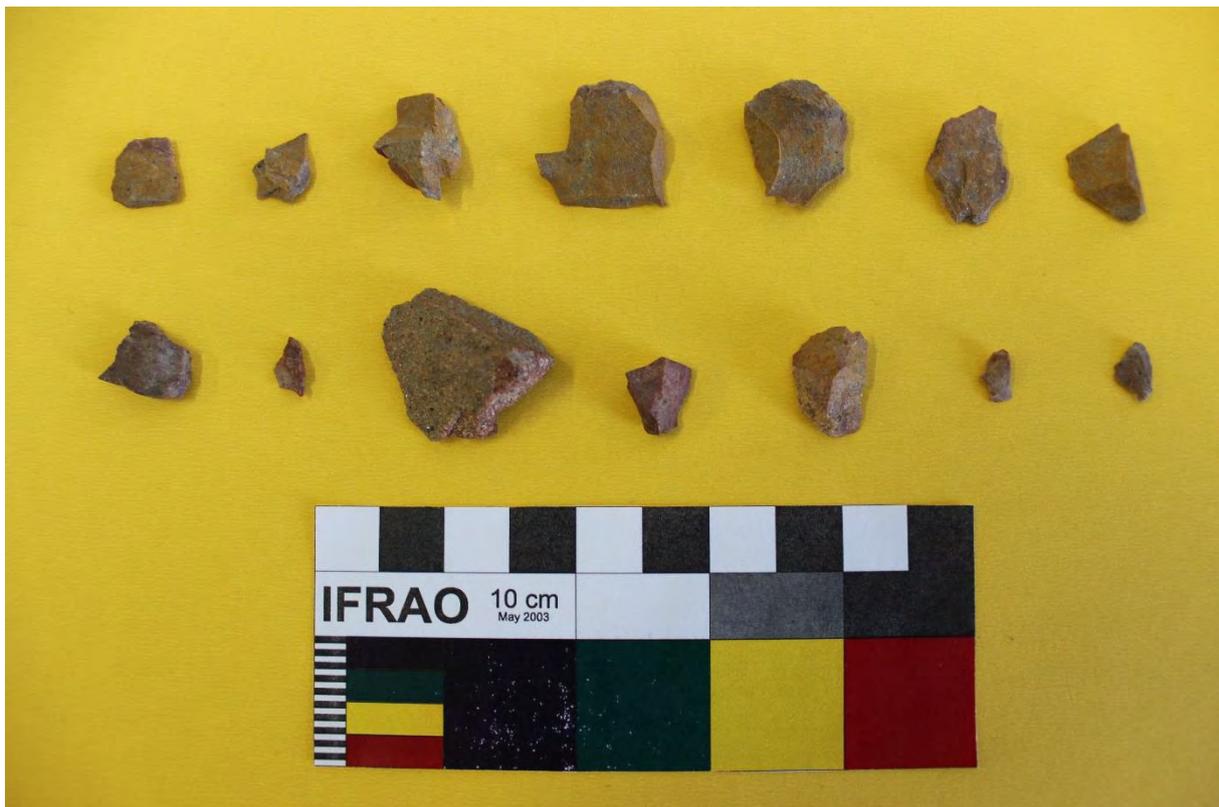
Full recorded artefact attributes are presented in Appendix B.

7.2.3 Artefact depth

The majority of the artefacts were recovered from 0 – 100 millimetres depth, broadly corresponding to the A horizon.

No artefacts were retrieved from the underlying B horizon.

Figure 18: Artefact assemblage retrieved from excavations at EFW South



8.0 ANALYSIS AND DISCUSSION

8.1 Levels of Disturbance

No significant instances of sub-surface disturbance were encountered during excavations at EFW South. The test excavation confirmed that the soils within EFW South are intact. Overall, the disturbances to the ground surface resulting from use of the study area for cattle grazing and do not appear to have had significant impact on identified Aboriginal objects within EFW South.

8.2 The Artefact Assemblage

Artefact density was low across the site (0.76 artefacts/m² on average). There is a slight concentration of artefacts within the north central portion of Area 2; however artefacts are diffuse overall and no meaningful patterns between location and landform. The small size of the assemblage means that patterns of intra-site artefact distribution cannot be reliably (statistically) established.

The low artefact density at EFW South conforms to the wider pattern of variable artefact densities recorded during sub-surface investigations in the region. Previous archaeological investigations in the area identified high concentrations of artefacts adjacent major waterlines in the area (Ropes Creek and Eastern Creek); with a drop in artefact density in the transitional land between them. The landscape located between the major waterlines having mostly background scatter, with higher densities identified on rises adjacent waterlines. Site EFW South is located within the lower lying, transitional land, between the two major creeks; and therefore conforms to site patterning of the region.

The artefacts recovered comprise small to medium sized angular fragments, distal flakes, complete flakes and a proximal flake. Silcrete was the only raw material type identified; studies have shown that silcrete is ubiquitous across the Eastern Creek area and wider Cumberland Plain region.

8.3 Discussion and Conclusion

The archaeological investigations undertaken at EFW South uncovered a low density assemblage of small to medium size flakes and angular fragments with no evidence of usewear. The raw material used is common in the region. No evidence of intensive occupation of the site or the manufacture of stone tools was discovered. The assemblage is likely to reflect general stone reduction and discard rather than intensive occupation or site use. The overall results are reflective of background scatter or transient campsites related to the movement of Aboriginal people across the landscape. The type of low-density site represented by EFW South is common in the Eastern Creek area and wider Cumberland Plain region. This factor, along with the absence of complete tools or areas of tool manufacture, contributes to the lack of research value for site EFW South. As a result, no further archaeological investigation at the site is recommended. EFW South was initially recorded by GML as an artefact scatter with PAD; the site will be updated on the Aboriginal Heritage Information Management System (AHIMS) to incorporate the identified subsurface artefacts.

9.0 SIGNIFICANCE ASSESSMENT

9.1 Assessment Criteria

Archaeological significance refers to the archaeological or scientific importance of a landscape or area. This is characterised by using archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These are outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

9.2 Archaeological Significance Assessment

Archaeological test excavation within EFW South, identified a low density, generally dispersed artefact scatter. While there is a significant distance between some of the outlying artefacts, they are of consistent material, similar depth and with the same slightly elevated landform adjacent ephemeral waterlines. Assessment of the scientific significance of EFW South considered the following aspects of the test excavation results:

- The results reflect a mostly diffuse (slight concentration within north central portion of Area 2), low density artefact scatter which most likely reflect intermittent use of the area. While being located close to water sources, the area would be prone to flooding. There are higher slopes in crest in the nearby region that would be preferable camp sites; as they would offer a view of the terrain and dryer camping place.
- The test excavation results fit the predictive model based on information available in the local context on the distribution of artefacts in similar landscape settings. Previous surface and sub-surface archaeological investigations in the area identified high concentrations of artefacts adjacent major waterlines in the area (Ropes Creek and Eastern Creek); with a drop in artefact density in the transitional land between them. The landscape located between the waterlines having mostly background scatter. The artefacts identified adhere to the local model; and are therefore common within the local context and have limited research potential.
- The artefacts identified during test excavation offer low research or educational value. All material recovered the same quality silcrete raw material and artefacts were waste flakes, with very little technical diversity.

10.0 IMPACT ASSESSMENT

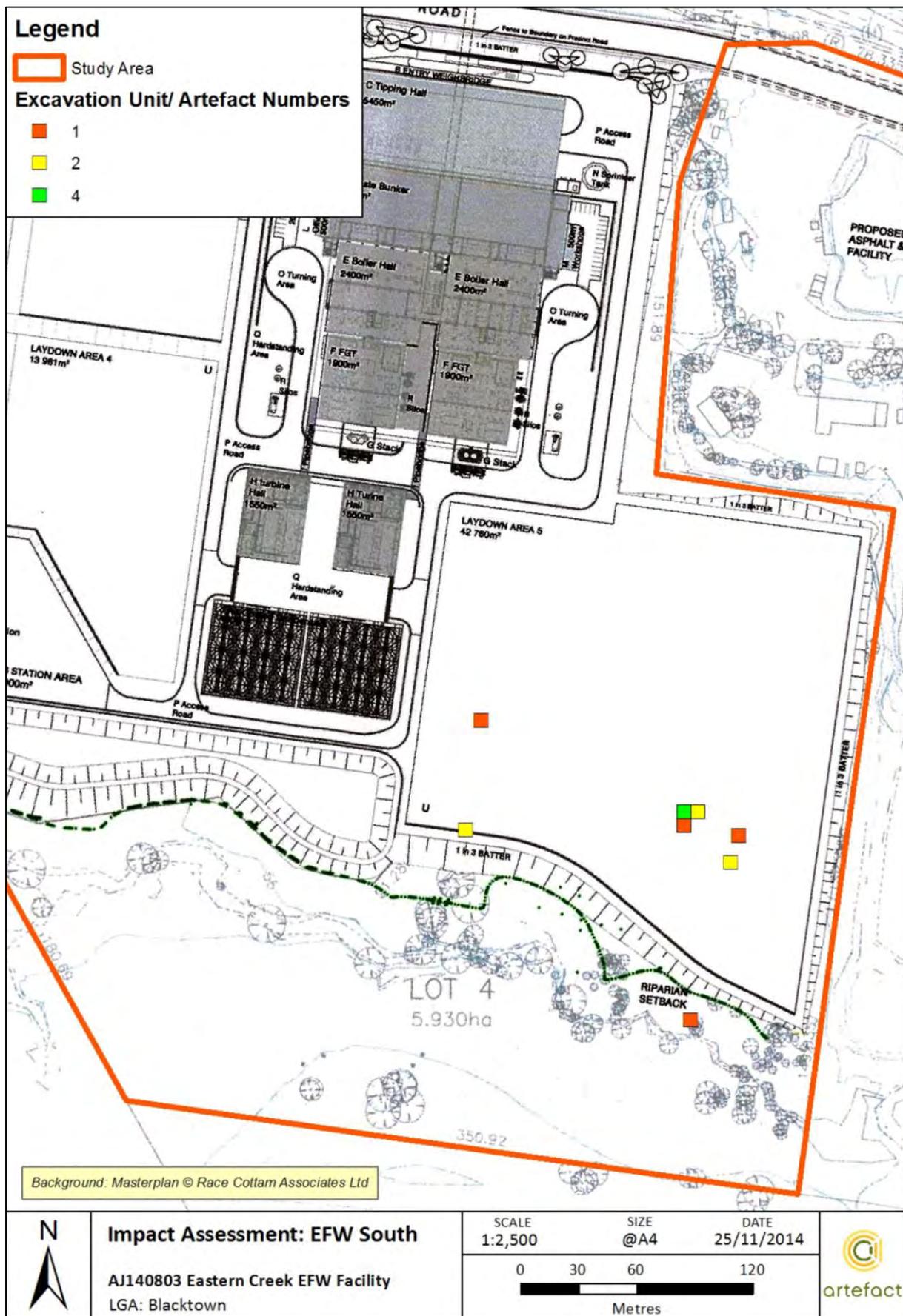
10.1 Impacts of the Proposed Development

Aboriginal objects have been retrieved from archaeological test excavation at EFW South. This site would be directly impacted by the proposed development (Figure 19). One area where artefacts were located will be within the Riparian Corridor, which will not be impacted; therefore there will not be a total loss of value. The assessment of impact is summarised in Table 6.

Table 6: Impact Assessment

Site Number	Site Name	Type of Harm	Degree of Harm	Consequence of Harm
##-#-####	EFW South	Direct	Total	Partial loss of value

Figure 19: EFW South Artefacts over Proposed Impact Area



11.0 MITIGATION AND MANAGEMENT

11.1 Guiding Principles

The overall guiding principle for cultural heritage management is that where possible Aboriginal sites should be conserved. If conservation is not practicable, measures should be taken to mitigate against impacts to Aboriginal sites.

The nature of the mitigation measures recommended is based on the assessed significance of the site. The final recommendations would also be informed by cultural significance, which will be discussed by the Aboriginal community in their responses during the next stage of consultation.

11.2 Mitigation measures

Site EFW South has been assessed to be of low archaeological significance. No further archaeological investigation of that area is required prior to impacts taking place.

An Aboriginal Site Impact Recording Form (ASIRF) will be submitted to the OEH AHIMS Registrar by Artefact Heritage detailing the procedure and results of the test excavation program and the assessment of Site EFW South as demonstrating low archaeological significance.

As Aboriginal objects would be impacted by the proposal, comprehensive Aboriginal consultation in accordance with the *DEC Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation 2005* has been undertaken. The results of the community consultation and the test excavations have been included in an Aboriginal Cultural Heritage Assessment Report (ACHAR).

The aim of the ACHAR is to:

- Describe the site area and the Aboriginal stakeholder consultation process.
- Summarise the site information available, including results of previous archaeological investigations and a summary of archaeological test excavation results.
- Describe the Aboriginal cultural heritage values of the site, including information on the cultural significance of the site provided by Aboriginal stakeholders.
- Describe the proposed activity.
- Outline methods for avoiding or minimising harm.

The draft version of the ACHAR was provided to registered Aboriginal stakeholders for comment on ##. The finalised ACHAR would be forwarded to the Department of Planning and Infrastructure prior to approval of the EIS.

An ASIRF must be completed and submitted to the OEH AHIMS Registrar within four months of completion of the authorised development works.

11.2.1 Reburial of test excavation artefact assemblage

The retrieved test excavation artefact assemblage should be reburied at a nearby location within the study area that will not be impacted by any future development works. Consultation regarding this was conducted as part of the Aboriginal stakeholder review of the ACHAR, and a preference for reburial has been indicated. The reburial site would be determined through consultation with the

proponent and the registered Aboriginal stakeholders. A site update card should be forwarded to the OEH AHIMS Registrar with information on the location and depth of reburial.

12.0 RECOMMENDATIONS

The following recommendations were based on consideration of:

- Statutory requirements under the EP&A Act 1979.
- The requirements of the DGRs.
- The results of background research, archaeological test excavation and assessment.
- The likely impacts of the proposed development.
- The interests of Aboriginal stakeholders.

It was found that:

- EFW South is a low density artefact scatter – a site type that is common within a local and regional context on the Cumberland Plain is of low archaeological significance. The proposed EFW Facility will have a direct impact on site EFW South.

It is therefore recommended that:

- No further archaeological investigation of site EFW South is necessary as it is of low archaeological significance.
- The ACHAR prepared by GML would be updated outlining the results of the additional Aboriginal consultation, test excavations and proposed impacts to the significance of Aboriginal heritage values of all identified Aboriginal sites within the study area.
- The retrieved artefact assemblage should be reburied at a nearby location within the study area that will not be impacted by any future development works. Consultation regarding this will be conducted as part of the Aboriginal stakeholder review of the ACHAR. The reburial site would be determined through consultation with the proponent and the registered Aboriginal stakeholders. A site update card should be forwarded to the OEH AHIMS Registrar with information on the location and depth of reburial.
- An Aboriginal Site Impact Recording Form must be completed and submitted to the OEH AHIMS Registrar within four months of completion of the authorised development works.

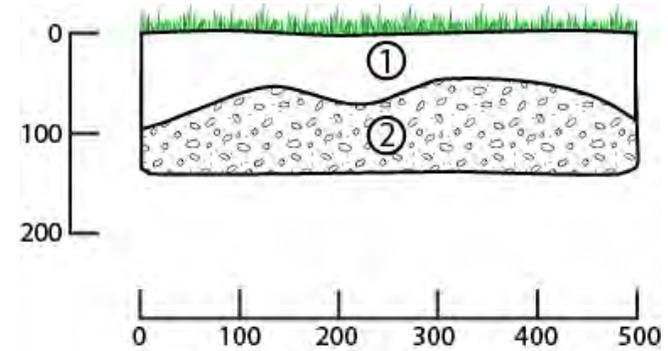
13.0 REFERENCES

- Artefact Heritage. 2014. Energy from Waste Facility, Eastern Creek - Aboriginal Heritage Test Excavation Methodology. Report to Urbis May 2014.
- Biosis. 2010. Erskine Park Link Road Aboriginal Archaeological Excavation undertaken as part of AHIP 1113179: Excavation Report. Report to RTA.
- Brayshaw and Haglund. 1996. M4 Upgrade Archaeological Survey for Aboriginal Sites for the proposal to upgrade the M4 Motorway from Church St, Parramatta, to Coleman St, St Marys, and Prospect to Emu Plains.
- Clark, N.R., and Jones, D.C., 1991. Penrith 1:100,000 Geological Sheet 9030, 1st Edition. Geological Survey of New South Wales, Sydney.
- EIS, The Next Generation and Urbis 2014. State Significant Development Application. Energy from Waste Facility, Eastern Creek. SSD 6236 – Environmental Impact Statement.
- GML 2014a. Energy from Waste (EFW) Plant, Eastern Creek: Aboriginal Archaeological Technical Report. Report for Urbis.
- GML 2014b. Energy from Waste (EFW) Plant, Eastern Creek: Aboriginal Cultural Heritage Assessment. Report for Urbis.
- Jo McDonald CHM Pty Ltd. 2002. Archaeological assessment of Aboriginal sites: Eastern Creek Strategic Land Use Study, SEPP59
- Jo McDonald CHM Pty Ltd. 2005. Heritage Conservation Strategy for Aboriginal sites in the lands owned by Austral Bricks P/L, Hartford Lane P/L, Jacfin P/L and Tesrol P/L in the Eastern Creek Business Park (Stage 3) Precinct Plan, Blacktown, NSW. Report prepared for APP Corporation Pty Ltd.
- Jo McDonald CHM Pty Ltd. 2006. Archaeological Subsurface Investigations at SEPP59. EC3/1 and EC3/2. Wonderland Surplus, Old Wallgrove Road, Eastern Creek. Report for Australand Holdings Pty Ltd.
- KNC. 2011. Australand Eastern Creek - Salvage Excavation Program. Report for Australand Property Group.
- Steele, D. 2003. Aboriginal Archaeological Test Excavation Report - Proposed Wonderland Business Park Development - Land Adjoining the Wonderland Theme Park, Wallgrove Road Eastern Creek.

APPENDIX A: TEST PIT SUMMARY

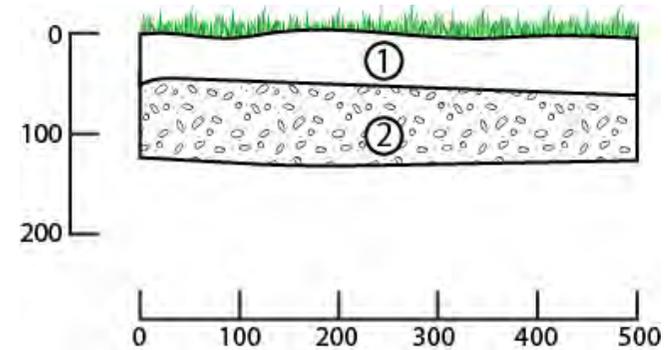
Area 1

Excavation Unit: TP1 **Easting:** 298706 **Northing:** 6257639 **Artefacts:** 0



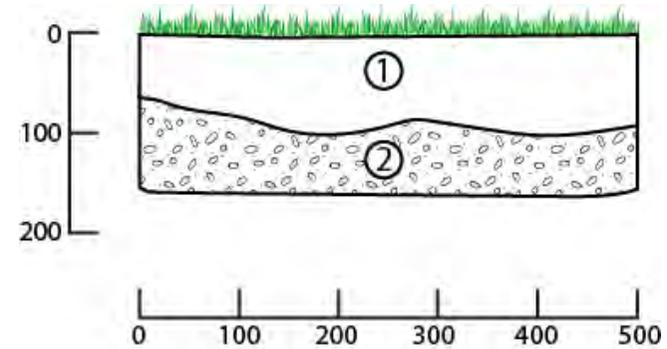
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- 2. Brown/orange clay

Excavation Unit: TP2 **Easting:** 298722 **Northing:** 6257644 **Artefacts:** 0



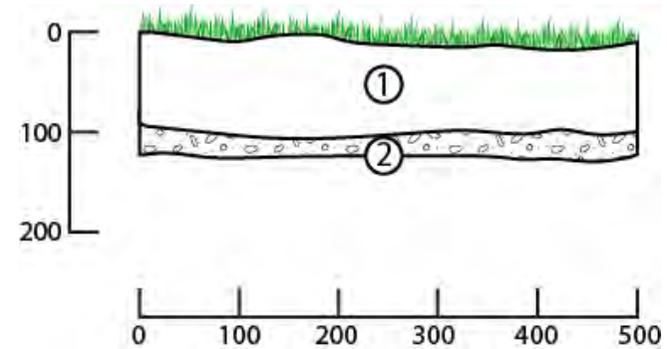
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Excavation Unit: TP3
Easting: 298737
Northing: 6257646
Artefacts: 0



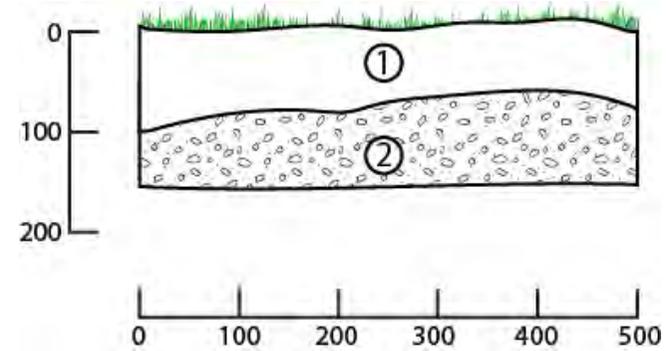
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- 2. Brown/orange clay

Excavation Unit: TP4
Easting: 298752
Northing: 6257648
Artefacts: 0



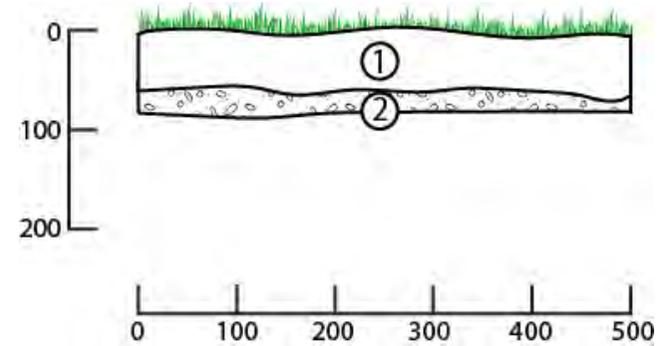
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- 2. Brown/orange clay

Excavation Unit: TP5
Easting: 298767
Northing: 6257651
Artefacts: 0



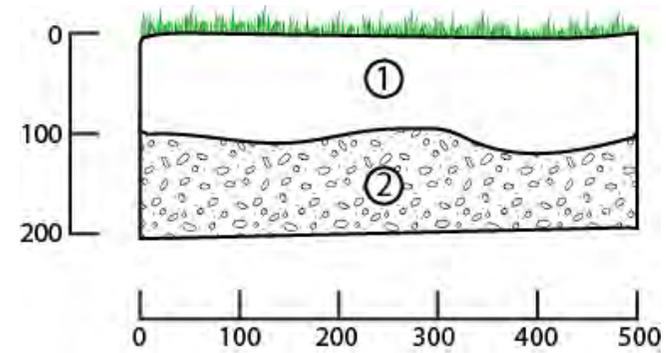
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2. Brown/orange clay

Excavation Unit: TP6
Easting: 298781
Northing: 6257654
Artefacts: 0



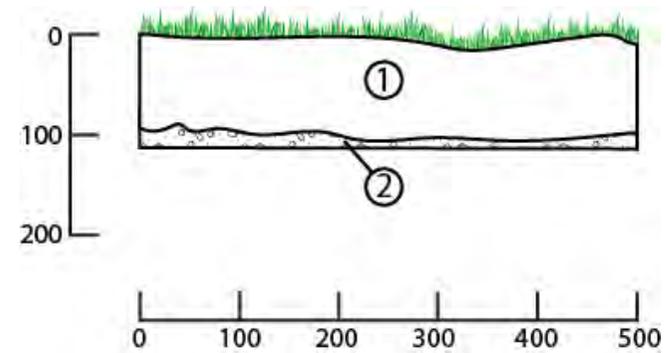
1. Brown silty loam
2. Brown/orange clay

Excavation Unit: TP7
Easting: 298796
Northing: 6257656
Artefacts: 0



- 1. Brown silty loam
- 2. Brown/orange clay

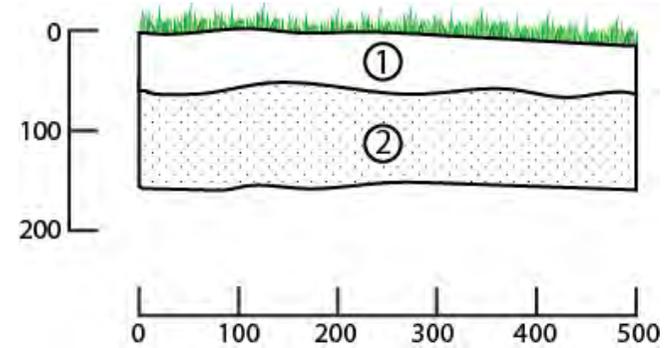
Excavation Unit: TP8
Easting: 298710
Northing: 6257659
Artefacts: 0



- 1. Brown silty loam
- 2. Brown/orange clay

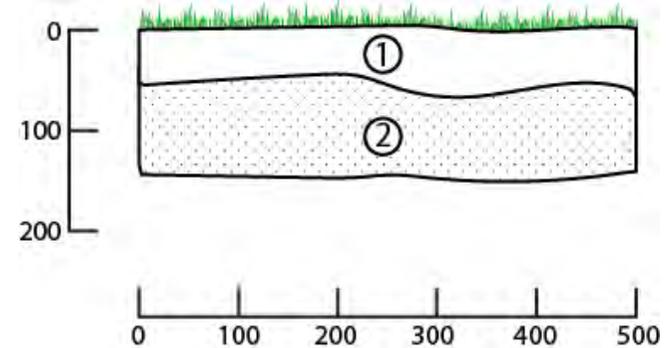
Area 2

Excavation Unit: TP9
Easting: 298700
Northing: 6257527
Artefacts: 0



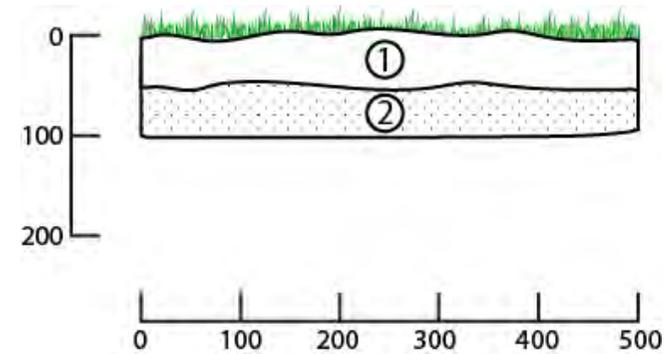
1. Light brown clayey loam
2. Brown silty clay, mottled orange

Excavation Unit: TP10
Easting: 298707
Northing: 6257552
Artefacts: 0



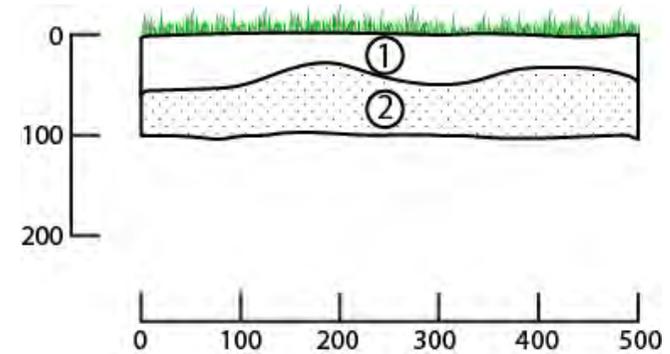
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2. Brown silty clay, mottled orange

Excavation Unit: TP11
Easting: 298717
Northing: 6257505
Artefacts: 0



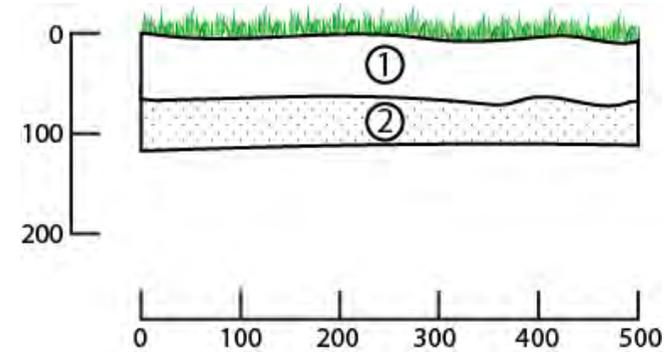
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2. Brown silty clay, mottled orange

Excavation Unit: TP12
Easting: 298720
Northing: 6257521
Artefacts: 0



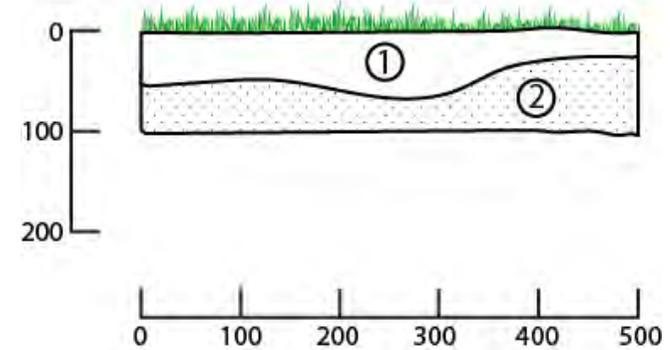
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2. Brown silty clay, mottled orange

Excavation Unit: TP13
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Northing: 6257545
Artefacts: 0



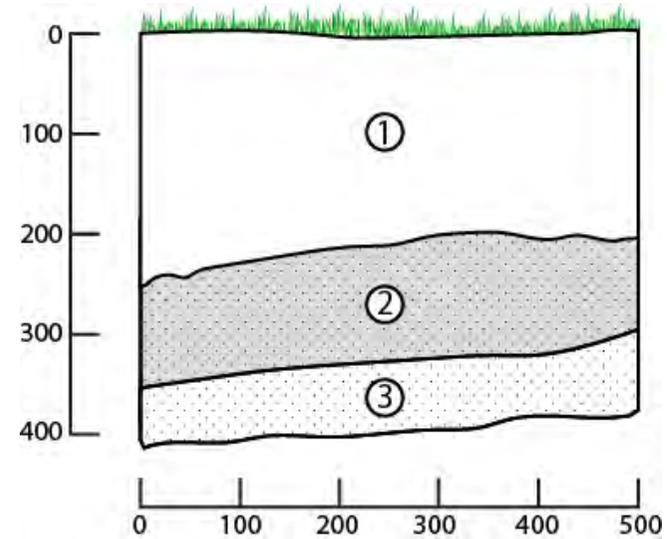
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2. Brown silty clay, mottled orange

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Easting: 298728
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Artefacts: 0



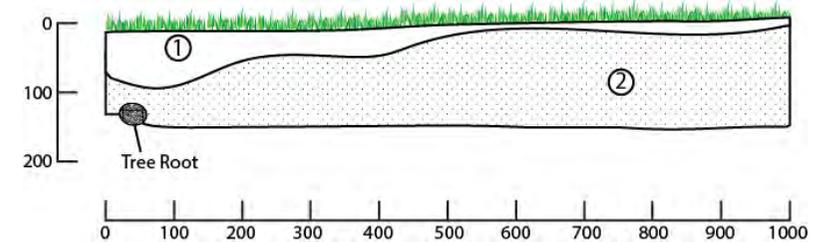
1. Light brown clayey loam
2. Brown silty clay, mottled orange

Excavation Unit: TP15
Easting: 298756
Northing: 6257530
Artefacts: 0



- 1. Light brown clayey loam
- 2. Brown clayey silt, some orange mottle
- 3. Brown silty clay, mottled orange

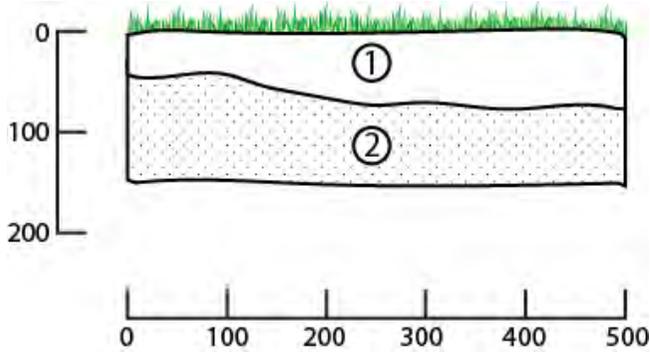
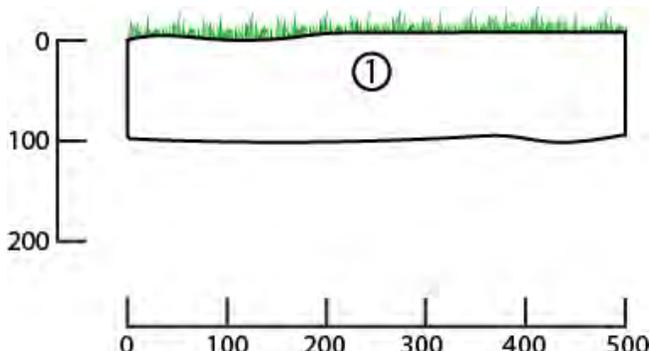
Excavation Unit: TP16-A
Easting: 298755
Northing: 6257543
Artefacts: 4



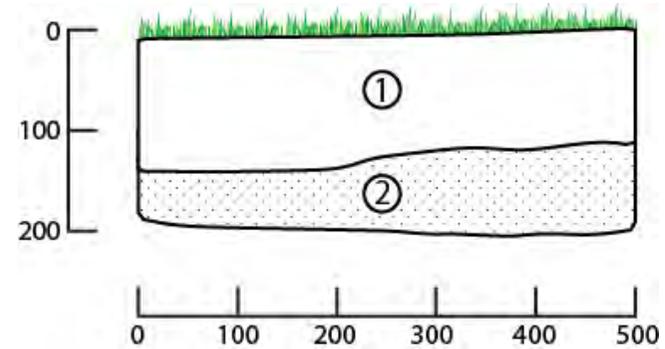
- 1. Grey brown silty loam
- 2. Light brown silty clay, mottled orange

Excavation Unit: TP16-B
Easting: 298755.5
Northing: 6257543
Artefacts: 2

As per T16-A description above

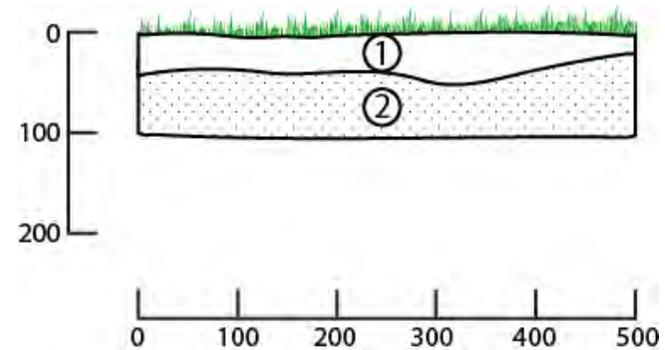
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Excavation Unit: TP17 2050 3050	Easting: 298756	Northing: 6257557	Artefacts: 0	 <p>1. Light brown clayey loam 2. Brown silty clay, mottled orange</p>
Excavation Unit: TP18 2075 3020	Easting: 298776	Northing: 6257520	Artefacts: 2	 <p>1. Light brown clayey loam 2. Brown silty clay, mottled orange</p>

Excavation Unit: TP19
Easting: 298780
Northing: 6257534
Artefacts: 1



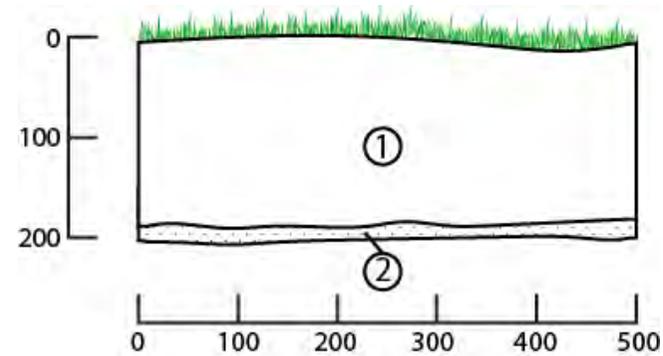
1. Light brown clayey loam
2. Brown silty clay, mottled orange

Excavation Unit: TP20
Easting: 298782
Northing: 6257549
Artefacts: 0



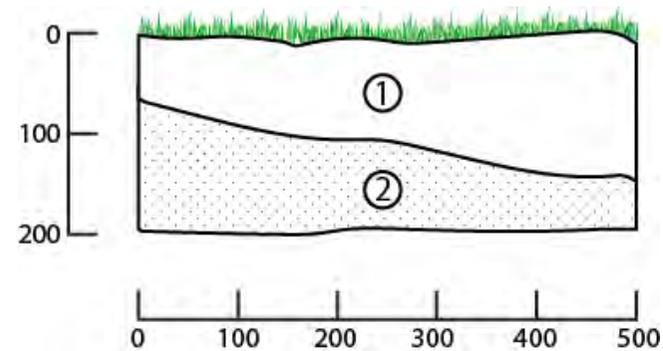
1. Light brown clayey loam
2. Brown silty clay, mottled orange

Excavation Unit: TP21
Easting: 298790
Northing: 6257511
Artefacts: 0



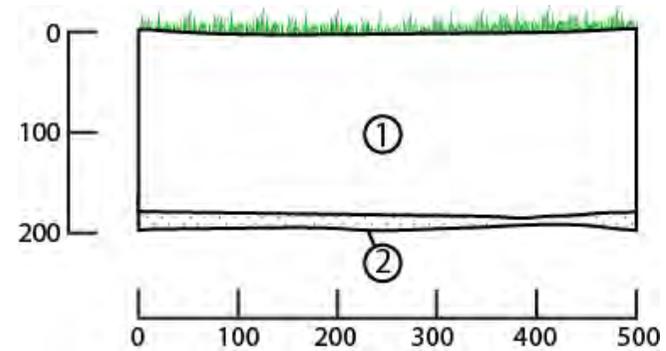
1. Light brown clayey loam
2. Brown silty clay, mottled orange

Excavation Unit: TP22
Easting: 298798
Northing: 6257519
Artefacts: 0



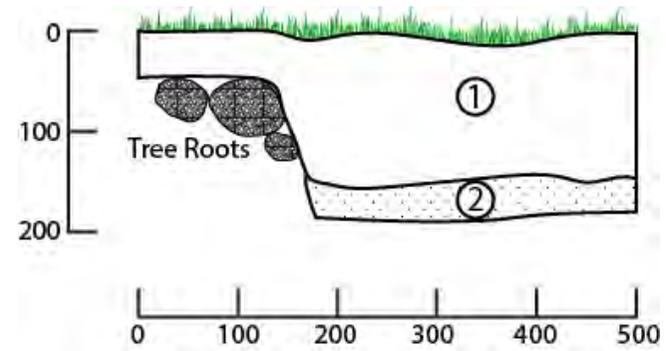
1. Light brown clayey loam
2. Brown silty clay, mottled orange

Excavation Unit: TP23
Easting: 298806
Northing: 6257534
Artefacts: 0



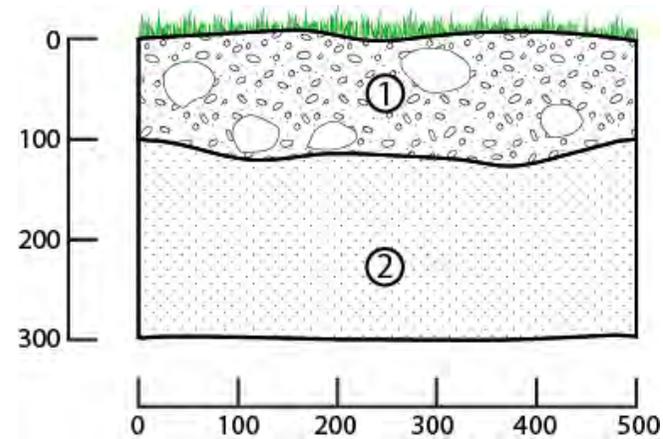
- 1. Light brown clayey loam
- 2. Brown silty clay, mottled orange

Excavation Unit: TP24
Easting: 298816
Northing: 6257547
Artefacts: 0



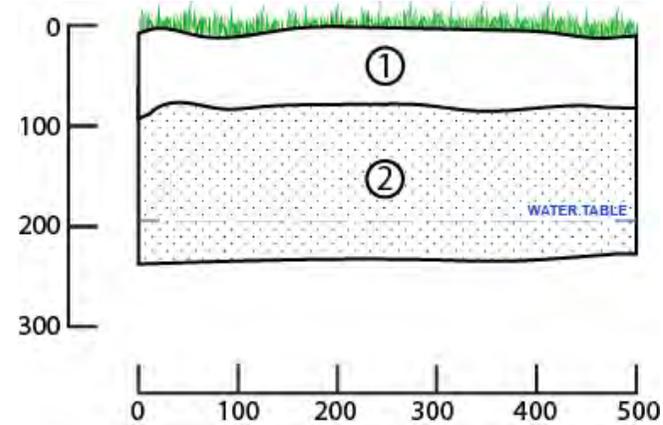
- 1. Light brown clayey loam
- 2. Brown silty clay, mottled orange

Excavation Unit: TP25
Easting: 298720
Northing: 6257442
Artefacts: 0



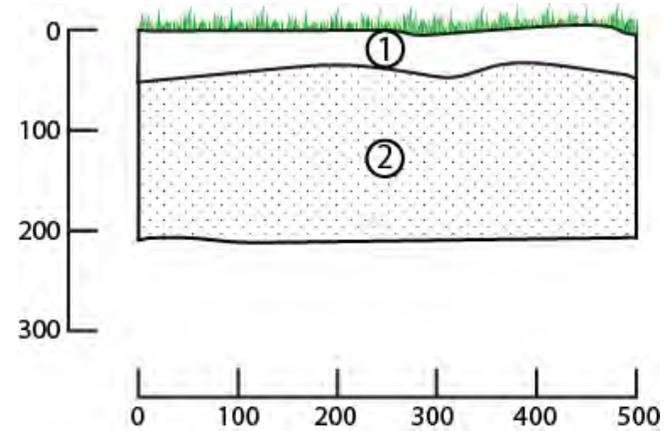
1. Brown silty loam, patches of compact tan silt and pebble inclusions
2. Damp reddish brown clay

Excavation Unit: TP26
Easting: 298738
Northing: 6257449
Artefacts: 0



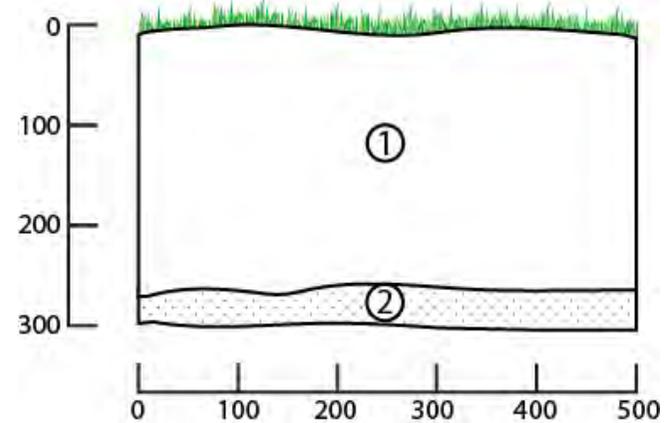
1. Brown silty loam, clay content increasing with depth
2. Waterlogged reddish brown clay

Excavation Unit: TP27
Easting: 298755
Northing: 6257438
Artefacts: 1



1. Brown silty loam, clay content increasing with depth
2. Reddish brown clay

Excavation Unit: TP28
Easting: 298766
Northing: 6257437
Artefacts: 0



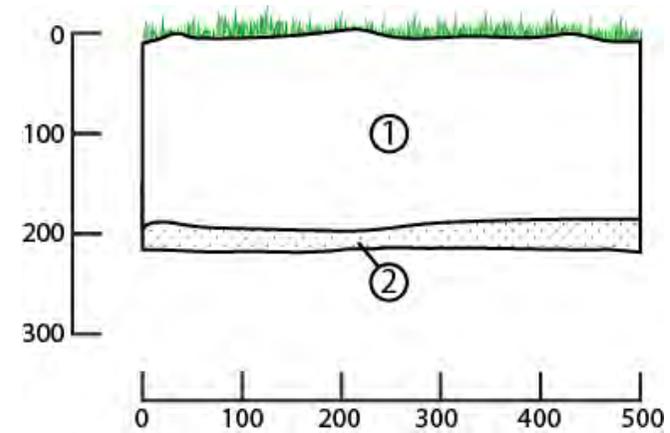
1. Brown silty loam, clay content increasing with depth
2. Reddish brown clay.

Excavation Unit:
TP29

Easting:
298779

Northing:
6257435

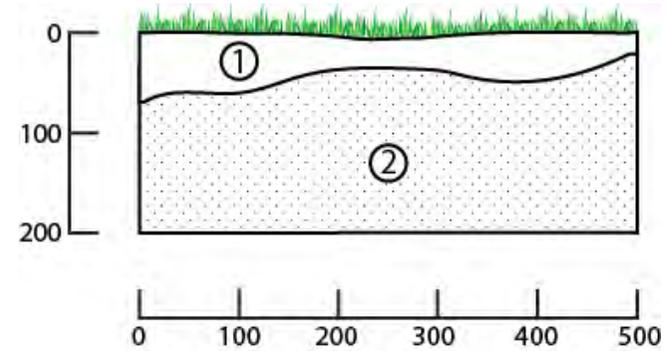
Artefacts:
0



1. Brown silty loam, clay content increasing with depth
2. Reddish brown clay

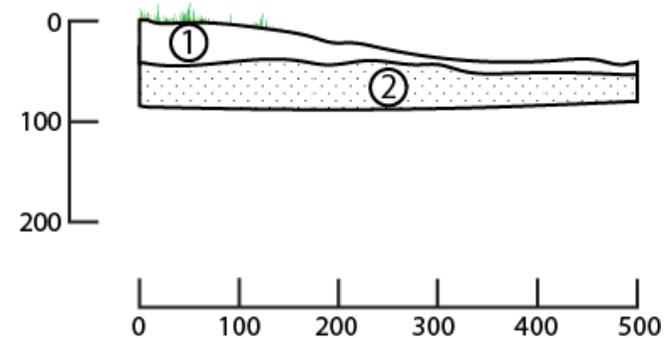
Area 3

Excavation Unit: TP30
Easting: 298639
Northing: 6257537
Artefacts: 2



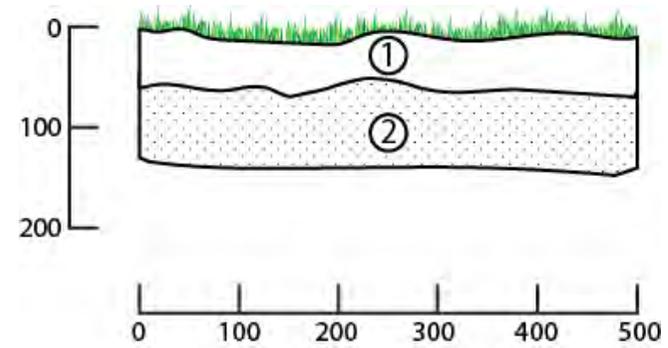
1. Compact, grey brown silty loam
2. Light brown silty clay, mottled orange

Excavation Unit: TP31
Easting: 298637
Northing: 6257553
Artefacts: 0



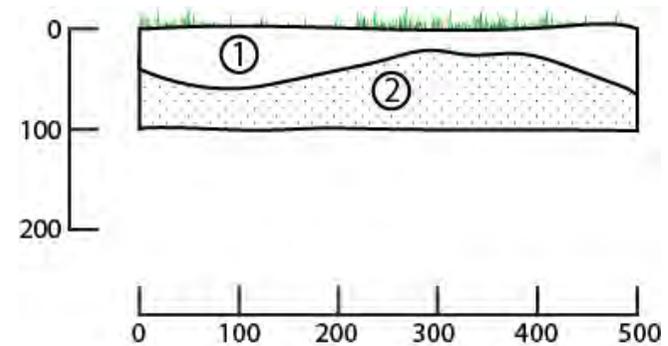
1. Compact, grey brown silty loam
2. Brown silty clay, mottled orange

Excavation Unit: TP32
Easting: 298642
Northing: 6257568
Artefacts: 0



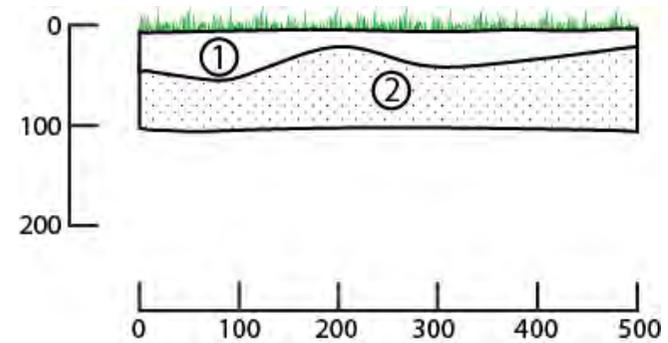
1. Compact, grey brown silty loam
2. Brown silty clay, mottled orange

Excavation Unit: TP33
Easting: 298644
Northing: 6257582
Artefacts: 0



1. Compact, grey brown silty loam
2. Brown silty clay, mottled orange

Excavation Unit: TP34
Easting: 298647
Northing: 6257594
Artefacts: 1



1. Compact, grey brown silty loam
2. Brown silty clay, mottled orange

APPENDIX B: ARTEFACT CATALOGUE

Artefact ID	Site Name	Area	TP	Spit	Material		Artefact				Attributes		Dimensions (mm)			Cortex (%)
					Type	Colour	Reduction Type	Tool/Core	Core Type	Notes	Platform Type	Termination Type	Length	Width	Thickness	
1	EFW South	2	16-A	1	SILCRETE	ORANGE	PROX FLAKE	-	-	-	PLAIN	-	11	11	2	0
2	EFW South	2	16-A	1	SILCRETE	ORANGE	DIST FLAKE	-	-	-	-	FEATHER	10	9	3	0
3	EFW South	2	16-A	1	SILCRETE	ORANGE	ANG FRAG	-	-	-	-	-	19	13	6	0
4	EFW South	2	16-A	1	SILCRETE	ORANGE	DIST FLAKE	-	-	-	-	FEATHER	21	15	4	0
5	EFW South	2	16-B	1	SILCRETE	ORANGE	COMP FLAKE	-	-	SINGLE FLAKE SCAR ON DORSAL	-	-	21	16	5	0
6	EFW South	2	16-B	1	SILCRETE	ORANGE	ANG FRAG	-	-	-	-	-	19	11	3	0
7	EFW South	2	16-C	1	SILCRETE	ORANGE	DIST FLAKE	-	-	-	-	FEATHER	10	15	4	0
8	EFW South	2	18	1	SILCRETE	RED	ANG FRAG	-	-	-	-	-	12	10	3	0
9	EFW South	2	18	1	SILCRETE	RED	ANG FRAG	-	-	-	-	-	10	5	2	0
10	EFW South	2	19	1	SILCRETE	ORANGE	DIST FLAKE	-	-	COARSE GRAINED	-	FEATHER	22	18	7	0
11	EFW South	2	27	2	SILCRETE	RED	ANG FRAG	-	-	-	-	-	11	9	6	0
12	EFW South	3	30	2	SILCRETE	ORANGE	COMP FLAKE	-	-	PLATFORM REMOVAL	PLAIN	AXIAL	10	16	6	5
13	EFW South	3	30	2	SILCRETE	RED	ANG FRAG	-	-	-	-	-	8	5	2	0
14	EFW South	3	34	1	SILCRETE	RED	ANG FRAG	-	-	-	-	-	9	6	1	0



artefact

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