A Technological Analysis of Stone Artefacts from Allen’s Cave, South Australia

A thesis submitted in partial fulfilment of the requirements for the Degree of Master of Archaeology and Heritage Management

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2016

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Declaration

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Simon Munt, June 2016

Acknowledgements

I dedicate this work to my late father, David.

My foremost thanks go to my adored family, followed by my highly professional supervisors, Drs Amy Roberts and Alice Gorman. The Far West Coast Aboriginal Organisation, Mr Clem Lawrie and Dr Keryn Walshe from the South Australian Museum were generous with their ongoing support for and engagement with this research, while William Moon has been a peer and friend throughout our respective projects.

Several other people kindly offered assistance. Dr Scott Cane permitted the use of images from his excavation of Allen's Cave and encouraged critical analysis of his interpretations. Dr Alan Watchman provided at no cost his expert geoarchaeological opinion for several raw material samples, while tutelage from Greg Collins in the use of statistics and statistical programmes was invaluable. Drs Johan Kamminga and Richard Wright readily provided unsolicited encouragement, as did Drs Philip Hughes and Marjorie Sullivan during the project's embryonic stage. Staff at the South Australian Museum archives department assisted in sourcing the photograph of Allen Stewart.

Abstract

This thesis presents the first technological analysis of both previously excavated stone artefact assemblages from Allen's Cave, South Australia. Recent climate proxy records for the Allen's Cave region indicate that during the period from initial human occupation to the mid-Holocene, 39,800 ± 3100 BP to 5000 BP, two significant environmental fluctuations occurred. The Last Glacial Maximum (LGM; c. 30,000–19,000 BP) brought hyper-aridity never previously or since encountered by Aboriginal Australians, while local conditions during the early Holocene (c. 11,000–8000 BP) were relatively favourable. Using a technological approach, the lithics from before, during and after the LGM and early Holocene are analysed in order to examine whether, and if so how, inhabitants of this arid zone rockshelter responded to the contrasting environments via their stone technology. Based on this analysis, contributions are made to the ongoing consideration of two major models concerning the past human use of Australia's arid zone during climatic changes: 'refuges, barriers and corridors' (Veth 1989) and 'desert transformation' (Hiscock and Wallis 2005).

Results demonstrate that little technological change occurred during the human occupation of Allen's Cave, corroborating a conclusion shared by previous analysts Ljubomir Marun (1972) and Scott Cane (1995). While there was technological continuity from before and during the LGM, evidence shows a combination of consistency and behavioural change in the early Holocene. The appearance in the assemblage of non-local lithic raw material for the first time at c. 11,000 BP indicates trade/exchange and/or the possible expansion of foraging range by inhabitants of Allen's Cave. Contemporaneous improvement in local environmental conditions may have partly precipitated such behavioural change. A combination of evidence, however, suggests non-environmental factors, and the continuity of the LGM lithics indicates that the hyper-aridity of this period may not have catalysed behavioural change as suggested by previous models.

Chapter 1: Introduction

1.1 Research Description

This thesis presents a technological analysis of stone artefacts from one of Australia's oldest archaeological sites, Allen's Cave, which has a basal date of 39,800 ± 3100 BP (Cane 1995:13; Roberts et al. 1996:7, 15) and is located within South Australia's arid zone (Figure 1.1). In particular, this study addresses a gap in current knowledge by analysing whether, and if so how, local Aboriginal people used stone technology to respond to two contrasting periods of environmental change: the Last Glacial Maximum (LGM) and early Holocene. Potential human responses to climatic fluctuations are examined through an investigation of the extent and nature of any temporally corresponding changes in the previously excavated stone artefact assemblages.

Allen's Cave was first excavated by Ljubomir Marun in 1969, followed by Scott Cane in 1989–1990. Since their research, however, which involved different aims and approaches, new environmental data has revised accepted dates of the LGM, warranting a re-examination of their results and interpretations. The LGM was a period of intensely heightened aridity not seen at any other time during the human occupation of Australia (Hesse et al. 2005:66; Smith 2013:110; Thorley 1998:36). Previously, the time frame for this hyper-aridity had been widely accepted as c. 24,000–18,000 BP, whereas according to recent research, these climatic conditions spanned c. 30,000–19,000 BP (Fitzsimmons et al. 2013:91; Lambeck and Chappell 2001:683; Lambeck et al. 2002:349; Lambeck et al. 2014:15296; Petherick et al. 2008:800; Smith 2013:119,154). Within this period, a further intensification of hyper-aridity occurred c. 22,000–18,000 BP (Petherick et al. 2013:59, 65–72; Shulmeister et al. 2016:1440). Such revision in our understandings of the conditions experienced by the ancestors of Indigenous Australians considerably influences how archaeologists interpret the past.

The early Holocene, from c. 11,000–8000 BP, was, conversely, the most climatically favourable period in the history of human occupation of Allen's Cave (Cane 1995:17, 23–24, 26–27, 44; Martin 1973:294, 300–302; Turney et al. 2001:779, 782). Such an environment is inferred from local pollen and faunal analyses (Martin 1973; Walshe 1994). Prior to the early Holocene, arid-adapted chenopods (consisting of 33 Chenopodiaceae taxa and several Amaranthaceae taxa; Appendix 3) had dominated, whereas during the early Holocene, mallee scrub was widespread (Martin 1973:294, 300–301, 313). Mallee scrub requires more effective precipitation, defined as rainfall exceeding evaporation (Quigley et al. 2010:1093, 1100–1102). Faunal evidence reveals a significant decline in the prevalence of arid-adapted species and a proportionate increase in organisms more suited to scrubland (Martin 1973:300–301; Walshe 1994:254–260).

Many non-environmental factors affected past human behaviour, such as group dynamics and cultural and religious beliefs (e.g. Brady and Bradley 2014:366–376; Ross 2013). A range of previous studies in different regions have, however, demonstrated that environmental influences may be linked with behavioural changes (e.g. Hiscock 1994, 2002; Kennett et al. 2012; Smith et al. 2008; Turney and Hobbs 2006). As Allen's Cave was in one of the most arid parts of the continent (Hesse et al. 2004:87), significant potential exists to assess how climatic factors can affect the production of material culture.

This thesis also provides a contribution to two major hypotheses concerning the nature of Aboriginal peoples' responses to significantly increased aridity in Australia's arid zone. The first of these hypotheses is Peter Veth's (1989) biogeographical model, which proposes that the Allen's Cave region was an environment that acted as a 'barrier' to human occupation during harsh climatic times and a 'corridor' through which people travelled and temporarily occupied during more favourable periods. The second hypothesis is the 'desert transformation' model proposed by Peter Hiscock and Lynley Wallis (2005), which argues that people initially settled arid areas while they were semi-arid then made 'minor adaptations' upon the onset of full aridity. Hiscock and Wallis (2005) applied their model to past Aboriginal life broadly rather than specifically to stone technology and they did not quantify what constituted 'minor adaptations.' Analysis of Allen's Cave lithics can, however, contribute to the ongoing consideration of this model because stone technology was a vital component of past lifeways (e.g. Andrefsky 2009:66; Clarkson 2007:1; Clarkson and O'Connor 2006:160, 199; Flenniken and White 1985; Holdaway and Stern 2004:1; Shafer 2008:1584).

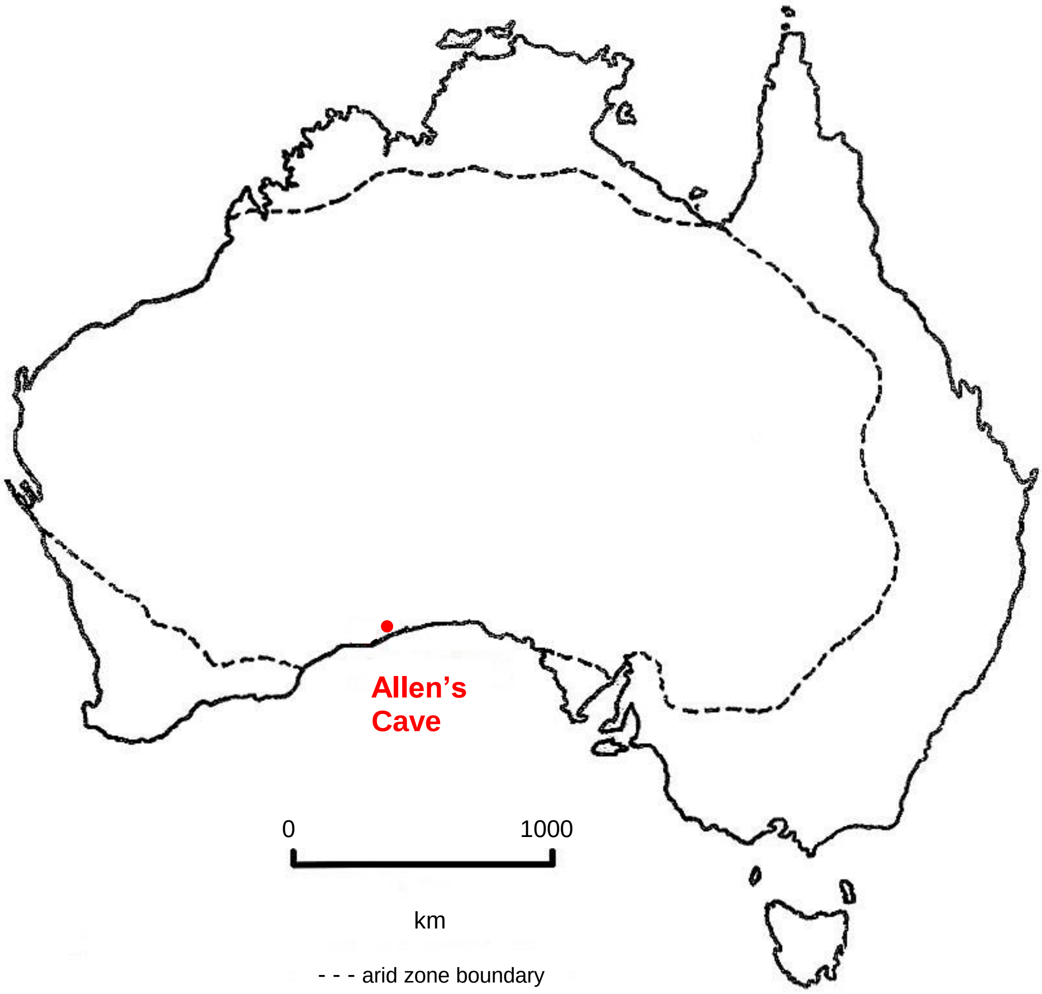


Figure 1-1 The location of Allen's Cave within Australia's arid zone. Adapted from Smith (2013:5).

1.2 Site Description

Allen's Cave is a rockshelter of Miocene Nullarbor Limestone (Burnett et al. 2013:246–248; O'Connell et al. 2012:1–3). Part of a karst landscape on the vast Nullarbor Plain, the rockshelter is located around 10 km inland from the modern coastline and approximately 8–10 km east of the South Australian/Western Australian border (Figure 1.1). The Nullarbor Plain is an almost completely flat, treeless plain in the 240,000 square km Eucla Basin, with numerous waterholes but no permanent streams (Gillieson and Spate 1992:65, 70, 86–88; James et al. 2012:568–571; Lipar and Ferk 2015:3). Allen's Cave was named after Allen Stewart (Cane 1995:1; Marun 1972:10; Walshe 1994:9), believed likely to be the child in Figure 1.2 on the basis of records in the South Australian Museum archives (no adult images were available). Stewart was an Aboriginal man of Mirning descent (Cane 1995:1) who had shown the rockshelter to Ljubomir Marun, its subsequent first excavator.

Figure 1-2 Allen Stewart. Image courtesy of South Australian Museum archives.

Allen's Cave has an 18 m x 10 m triangular floor and a 4 m high ceiling (Cane 1995:4; Roberts et al. 1996:8). The archaeological deposits occur in two stratigraphically distinct sections: a brown, loamy sand and an orange clay/sand (Marun 1972:242; Figure 1.3) that broadly correspond with the Holocene and Pleistocene respectively (Cane 1995:12–22; Walshe 1994:15). Extending to a depth of 4.03 m below the surface ('b.s.'), these archaeological deposits contained stone artefacts, hearths, an abalone shell (*Haliotis laevigita*; Cane 1995:34), a cockle shell (*Katelysia scalarina*; Cane 1995:37) and other faunal remains.

Keryn Walshe (1994) analysed the faunal material, which included Tasmanian devils, bettongs, hopping mice, native mice, bandicoots, kangaroos, wallabies, stick nest rats, wombats, owls and dingoes (dingoes entered the faunal record in the mid-late Holocene). Only 2.2% of the faunal remains, according to Walshe (1994:237–261), were the result of human discard, with the rest being deposited by other fauna, particularly owls. Walshe inferred that humans at Allen's Cave consumed predominantly small to medium prey (Walshe 1994:246–257). Humans occasionally hunted large macropods, based on direct evidence such as prey bone fragments greater than 35 mm along with calcined bone indicating cooking (Walshe 1994:247–257).

▲ = brown, loamy sand; broadly Holocene. ■ = orange clay/sand; broadly Pleistocene.

Figure 1-3 The two distinct sections of sediment. Image courtesy of Scott Cane.

1.3 Environmental Changes Since Initial Human Occupation

Environmental conditions would have been somewhat more favourable over the first 5000 or so years of the human occupation of Allen's Cave (beginning 39,800 ± 3100 BP) than during the ensuing 16,000 years (Hesse et al. 2004; Hiscock and Wallis 2005:35, 41, 43). Aridity began to increase across Australia's arid zone from around 35,000 BP (Fitzsimmons et al. 2013:79; Hiscock and Wallis 2005:41; Veth et al. 2011a:205), culminating in the hyper-arid LGM, spanning c. 30,000–19,000 BP (Fitzsimmons et al. 2013:91; Lambeck and Chappell 2001:683; Lambeck et al. 2002:349; Lambeck et al. 2014:15296; Petherick et al. 2008:800; Smith 2013:119,154). Allen's Cave was well inland throughout the LGM, with the coast 160 km away at c. 20,000 BP (Martin 1973:287; Turney et al. 2001:782). From 19,000–11,000 BP aridity gradually decreased in the southern Australian arid zone (Fitzsimmons et al. 2013:83–84; Hiscock and Wallis 2005:46; Kershaw 1995:665). Effective precipitation increased, temperatures rose and conditions were more stable and humid (Reeves et al. 2013:28). Evidence for the nature of the local climate following the optimal early Holocene (11,000–8000 BP) is, however, minimal, with proxies relating to more distant regions. Therefore, the temporal focus of this analysis is c. 40,000–5000 BP.

1.4 Previous Analyses of Allen's Cave Stone Artefacts

Ljubomir Marun, with field colleagues Peter Thompson, Johan Kamminga and Sandra Bowdler, conducted the first excavation at Allen's Cave in 1969. This was followed in 1989–1990 by Scott Cane, who was assisted by Rhys Jones and Anne Nicholson. Dates obtained varied considerably between the two excavations, due primarily to differences in dating techniques available for each, and because of contrasting interpretations of sediment deposition ratios. Marun obtained five radiocarbon dates and used the oldest date in combination with his calculations of sediment deposition ratios at Allen's Cave to arrive at a basal date of approximately 25,000 BP (Marun 1972:241–242, 244, 248–249). For Cane's excavation, Roberts et al. (1996:15) obtained an Optically Stimulated Luminescence (OSL) date of 39,800 ± 3100 BP for sediment immediately overlying the lowest artefacts. Compelling reasons exist for the integrity of Cane's (1995) dates in comparison to those proposed by Marun (1972) (Chapter 4). Therefore, in order to compare Marun's (1972) assemblage with Cane's (1995), calculations to correlate Marun's (1972) dates were required (Chapter 4).

Although Marun's (1972) analysis was detailed and aspects of his methods could be considered progressive for his time, he rarely used his interpretations about the lithics to make specific behavioural inferences. He concluded, for example, that artefacts were generally smaller in the Holocene than they were in the Pleistocene without suggesting any reasons for this change (Marun 1972:332). Marun (1972) also placed little emphasis on raw material analysis. He identified 81.4% of the lithics with modified edges as 'flint' and other raw materials as 'represented in insignificant proportions' (Marun 1972:254), but did not infer potential behaviours in relation to the non-'flint' material. Comparisons of the sources of the raw materials in the environment has the potential to inform us about the movement of people and/or the existence of trade/exchange systems between groups, along with shifts in technological behaviour and in the use of landscapes (e.g. Davidson et al. 2005; Dickson 1981; Hiscock 2005; McBryde 1987:252–273; McCarthy 1977; Roth 1897; Tibbett 2002, 2006).

Cane's (1995:22) broad aims were to obtain a sense of the intensity of the use of Allen's Cave over time and to explore the potential of raw material analysis for indicating how the presence of 'flint' might indicate sea-level changes. He argued that sea levels by the start of the Holocene had reached and begun to erode the Nullarbor cliffs, exposing sources of 'flint' (Cane 1995:22, 27). Cane (1995:31–33, 43) ultimately concluded that little change occurred in the lithics over time, other than an overall trend of a reduction in artefact size. Based on the observation that all retouched artefacts were made from what he identified as 'flint', he argued that people preferentially used 'flint' rather than varieties of limestone when 'flint' became more readily available upon changed environmental circumstances around 10,000 BP (Cane 1995:25–26, 28, 43). Cane (1995:27) also regarded the presence around this time of 'silcrete' flakes as the first proof of trade or exchange among people from this region, because the nearest known source of silcrete is 200 km north of Allen's Cave.

Cane's (1995:22) aims required the examination of only a limited range of artefact attributes. Access and logistical constraints prevented him from viewing Marun's (1972) material (Cane 1995:7–8). This thesis, therefore, is the first study to provide interpretations based on the analysis of lithics from both assemblages.

1.5 Approaches to Lithic Analysis

Lithics can be analysed via a range of approaches, depending on the research question(s). The two major frameworks are the typological and technological approaches, each of which has advantages and disadvantages.

1.5.1 The Typological Approach

The typological approach to lithic analysis involves the classification of artefacts into formal types, such as scrapers, tulas, backed artefacts, horsehoof cores and burins. Classifications are based on the analyst's interpretation of the extent to which various artefact attributes recur, with a particular emphasis on morphology (e.g. Bordes 1973, 1978; Buchanan et al. 2011; Buchanan et al. 2015; Debenath and Dibble 1994:94–109; Dibble 1995a; Gould et al. 1971; Horne and Aiston 1924; Howchin 1934; Leakey 1970, 1971; McCarthy 1976; Prasciunas 2011; Tindale 1957; see also critique in Mulvaney 1977).

Typological approaches have been employed for the analysis of lithic assemblages in many parts of the world. In Australia, the typological framework has been used by researchers such as Horne and Aiston (1924), Howchin (1934), McBryde (1977), McCarthy (1976, 1977), Mulvaney (1985) and Tindale (1957). In Europe, lithic typologies have been used extensively, such as by Dibble (1995a) and Bordes (1973, 1978) for Lower and Middle Palaeolithic French assemblages. Bordes (1973, 1978) based his typological analyses largely on morphology and on the assumption that lithic variation was created intentionally by artisans for stylistic and functional reasons.

Binford and Binford (1966, 1969), however, argued that lithic variation was primarily influenced by other factors, such as raw material type, the fracture mechanics involved in stone artefact reduction, and functional requirements. Dibble (1995b) concurred, arguing that scraper morphology was often the result of use. This debate is ongoing (e.g. Buchanan et al. 2015; Debenath and Dibble 1994:4–6; Dibble 1995b; Hiscock 2007; Kuman and Field 2009:157; McCarthy 1977; Schick and Toth 1993:96–100). In east Africa, Leakey (1970, 1971) and others, such as Toth (1985) and Kuman and Field (2009:157–168), typologically classified early Oldawan lithics and in North America Clovis and Folsom points have formed the basis of a range of typological analyses (e.g. Buchanan et al. 2011; Buchanan et al. 2015; Prasciunas 2011).

Insights into past behaviour can be derived from the implementation of a typological framework. It can, for example, be used to compare the prevalence, nature and changes of certain 'types' of artefacts across locations and time to establish whether there existed regional sequences and/or trade or exchange systems (Hiscock 1994, 2005:287). 'Types' can also be compared within assemblages and across a broad range of non-lithic material. Spaulding (1953:306–312), for example, made such comparisons in his typological analysis of pottery vessels, while Adams (Adams and Adams 1991:99–142) used the temporal variations reflected by 'types' of medieval Nubian pottery sherds and vessels to develop a chronology of Nubian cultural development.

Limitations exist, however, in typological approaches. At times they have been based on a presumption that the artefact manufacturer began with a mental template for the product's final overall morphology (e.g. Bordes 1978). Attempting to determine whether a mental template is reflected in each individual artefact is problematic. Stone artefact morphology can be dynamic, changing over the course of production and use, and lithic manufacture cannot always be carefully controlled due to factors such as pre-existing flaws in a rock, differences in raw material and the angle and extent of applied force (Andrefsky 2009:24–40; Clarkson 2007:37; Clarkson and O'Connor

2006:183–188; Collins 2008; Cotterell and Kamminga 1987; Flenniken and White 1985; Hiscock 1983:49–50; Holdaway 1995:793; Macgregor 2005; Odell 2000:281–283; Odell 2001; Pelcin 1997:1109–1112; Rolland and Dibble 1990:484–493; Shafer 2008:1584–1589; Speth 1972).

Morphology cannot be presumed to have been the factor of primary importance to knappers. In their ethnographic studies with Western Desert people, for example, Hayden (1977) and Cane (1992) demonstrated that overall morphology was of relatively minimal concern, with the working edge of an artefact being the priority. White's (1967:409–412) ethnographic observations similarly revealed that the artefact edge was the primary concern for New Guinean highlanders.

The varying criteria used for typological classifications across different studies can also reduce the ability for direct comparison. Such different foundations can limit a major aim of the approach, the establishment of regional and broader artefact sequences. Early typologies often focussed only on retouched artefacts in an assemblage, and different typological classifications are often based not only on morphology but also on factors such as artefact function. Such conflation was evident, for example, in Howchin's (1934) classification of scrapers into many sub-types based solely on morphology, Tixier's (1995) typological assignations of Levallois lithics based largely on the reduction sequence used in their production, and Bordes' (1961) and McCarthy's (1976) scraper typologies that incorporated functional considerations.

Even when typologies are based on the same broad criteria, minimising subjectivity between researchers can be challenging. Dibble (1995a:111), for example, found that while broad agreement existed between his and Tuffreau's (1988) analysis of Middle Palaeolithic stone artefacts from Biache-Saint Vaast in France, differences frequently occurred over more subjective interpretations. In particular, this involved distinguishing between convergent scrapers and Mousterian points (Dibble 1995a:94).

Style can form another basis for typological classifications, but definitions vary. Sackett (1982:65), for example, defined style as any aspect of artefact variation particular to a certain culture at a given time and place. He argued that style could be isochrestic—it could result from non-symbolic behaviour, with groups perpetuating particular artefact production choices rather than others that would achieve the same functional result, largely because of the benefits of routine and habit (Sackett 1982:67–80). Style could also be a reflection of consciously symbolic behaviour (Sackett 1982:80–106). Wiessner (1983:256–259, 273) and Wobst (1977) interpreted style as formal variation that conveyed identity at different levels including the individual, band and language group. Henshilwood and Dubreuil (1994:133) agreed, considering style in stone artefacts to be demonstrated by an 'over determination of form.'

Elucidating style from lithics is often problematic. Close (1978) acknowledged the difficulties involved in such assessments, as did others such as Henshilwood and Dubreuil (1994:132), Sackett (1982), Voss (1977), Wiessner (1983:270–273) and Wobst (1977), recognising that a number of other factors influence artefact morphology. Close (1978) nevertheless attempted to identify whether style contributed to variation among 23 late Palaeolithic North African assemblages. After eliminating several other potential factors such as function and artisan handedness, she concluded that style likely exerted some influence (Close 1978:229). Such a conclusion may be reasonable but is difficult to substantiate given that influences such as human cognition and religion were not identifiable from the lithics (Close 1978). Others have reached similar 'default' conclusions (e.g. Rick 1980). The difficulties involved in interpreting the possible impact of style in lithic variation add complexity to the establishment of typological classification criteria. The use of different criteria does not make typologies less valid or invalid but it can reduce the ability to directly compare assemblages.

Colonial, social Darwinist ideologies impacted some early typologies. Tylor (1869, 1871) and Lubbock (1865, 1870), for example, interpreted British material culture as evidence of human progress from barbarism and savagery toward civilisation. Such a perspective influenced archaeological interpretations in other European countries and their colonies, such as Australia, South Africa and America (e.g. Mason 1895; Morgan 1876:66–82; Spencer and Gillen 1899; Uhle 1907). Interpretations based on cultural progression continued for over a century. Tindale (1957; see critique in Bland et al. 2012:48–50), for example, typologically classified lithics from Ngaut Ngaut (Devon Downs) in South Australia according to a sequence of increasing 'sophistication' across four separate waves of peoples (see Bland 2012).

1.5.2 The Technological Approach

The technological approach to lithic analysis is the most conducive to exploring potential changes in the stone artefacts from Allen's Cave. This framework involves the analysis of lithic attributes that individually and in combination are indicative of particular human behaviours, based on the widely tested principles of fracture mechanics, which have been demonstrated to be the primary influence on stone artefact morphology (Andrefsky 2008; 2009:66–67, 88; 2010:24–30; Clarkson 2007:27–32; Clarkson and O'Connor 2006; Cotterell and Kamminga 1987; Hiscock 2007:202–203; Macgregor 2005; Pelcin 1997; Shafer 2008:1585–1589). The technological approach does not have the inherent limitations involved in classifying typological 'types.' It does not, for example, presume the existence of a mental template from the knapper (Hiscock 2007:202). Because artefacts are classified according to observable attributes rather than overall form (although some typologies similarly focus on specific attributes), the potential for interpretational variation is greatly reduced. While a technological framework can inform us about changes and/or continuity in lithic manufacture, determining artefact function requires use-wear/residue analysis. It is recommended that future research on the Allen's Cave lithics incorporates such an analysis, which was beyond the scope of this research.

The advantages of the technological approach do not mean that typological classifications are not valid or effective. Typological analysis can be particularly productive, for example, when reassessing an assemblage which had been previously analysed using such a framework (e.g. Clarkson 2002a:79). Further, several artefact 'types' are in fact widely recognised by Australian archaeologists, such as backed artefacts, tulas and scrapers, which affords the 'types' significant interpretational value (e.g. Attenbrow et al. 2009; Hiscock 1994, 2002; Holdaway and Stern 2004:212–274; McBryde 1985; McCarthy 1976; Smith 2013:185–192). Therefore, while the primary analysis in this study is based on a technological approach, well recognised 'types,' based on morphology, are also noted in order to facilitate comparisons with the interpretations of Marun (1972) and Cane (1995), both of whom adopted such classification systems. Making such observations may also assist future researchers conducting regional/national comparisons, providing a foundation for engagement with other Australia-wide debates.

1.6 Research Questions

The primary research question of this thesis is:

How did the Aboriginal people who inhabited Allen's Cave, South Australia, use lithic technology to respond to the intensely heightened aridity of the Last Glacial Maximum and to the more favourable local environmental conditions of the early Holocene?

This involves the consideration of the following sub-questions:

1. How do any technological changes or stasis in the Allen's Cave lithics correspond temporally with the LGM and early Holocene?

2. How can any technological responses of Allen's Cave inhabitants to the environmental conditions of the LGM contribute to models regarding Aboriginal responses to the heightened aridity of the period, specifically:

(i) ‘Refuges, barriers and corridors’ (Veth 1989); and

(ii) ‘Desert transformation’ (Hiscock and Wallis 2005)?

3. How do the results and interpretations from this lithic analysis compare with those of previous researchers including Marun (1972) and Cane (1995)?

1.7 Research Aims

Given the above synthesis and research questions, this study has two major aims:

1. To analyse Allen’s Cave stone artefacts using technological methods of lithic analysis.

2. To synthesise existing evidence for the palaeoclimate from the initial human occupation of Allen’s Cave, in order to establish the nature of the environmental conditions in which local people lived.

1.8 Significance

Understanding how humans behaved in response to environmental changes has been a major goal of Australian and international archaeologists over many decades (e.g. Heinsalu and Veski 2010; Hiscock 1988, 1994, 2002, 2008; Hiscock and Wallis 2005; Lane et al. 2013; Law et al. 2010; Oppenheimer 2004:4–18, 50–54; Ross et al. 1992; Smith et al. 2008; Thorley 1998; Veth 1987, 1989, 1993, 1995, 2005; Wheeler 1993; White 1971; White and Peterson 1969; Wiebke et al. 2011). With its deep antiquity spanning key climatic fluctuations, Allen’s Cave is ideal as a case study for exploring whether, and if so how, humans reacted technologically to environmental change.

Recent environmental research providing new dates for the LGM (e.g. Fitzsimmons et al. 2013; Lambeck et al. 2014) warrants a re-analysis of the lithic assemblages so that human reactions to environmental fluctuations can be explored according to contemporary knowledge. The application of recent techniques can provide new knowledge from previously analysed material (e.g. Hayward 2010; Hiscock and Attenbrow 2005; Pate et al. 2003; Roberts 1998). This study represents the first investigation of both of the Allen's Cave assemblages and therefore provides a more holistic analysis.

The location of Allen's Cave in one of the most arid parts of Australia's arid zone (Hesse et al. 2004:87; Smith 2013:151–152; Veth 2005:100) makes it conducive to a review of the prominent desert settlement hypotheses of Veth (1989) and Hiscock and Wallis (2005). Veth's (1989) pan-continental application of his model was based on a limited number of sites. Allen's Cave adds evidence from a key desert location to the test the model. The investigation of the stone technological behaviour at Allen's Cave from the early Holocene has the potential to further inform mid-Holocene intensification theories (e.g. Brian 2006; Lourandos 1983, 1985; Lourandos and Ross 1994; Veth 2006) by providing further comparative context of aspects of the Pleistocene-Holocene transitional period.

Analysis of the Allen's Cave lithics is of particular significance to the local Aboriginal community, represented by the Far West Coast Aboriginal Corporation (FWCAC). For many FWCAC members, the lithics represent the actions of their ancestors and learning more about how their predecessors lived can contribute to their ongoing sense of identity and connectedness with both their antecedents and the stone artefact assemblages distantly stored in Adelaide at the South Australian Museum. FWCAC support and engagement demonstrates the significance of this project to them.

1.9 Research Limitations

Several limitations exist for this research. No independent excavation could be conducted to seek further evidence with which to compare existing assemblages. A site visit was not possible for a range of reasons outside the author's control, which prevented, for example, the undertaking of a field survey to explore relevant factors such as raw material sources in the region. New dating samples, which may have assisted in reconciling the dating discrepancies between Marun (1972) and Cane (1995), were unable to be obtained due to the absence of remaining dateable charcoal and because of fire damage to stored faunal material recovered from the site (Dr Keryn Walshe 2015, pers. comm.).

Only the lithics from one of seven of Marun's (1972) trenches ('E3') were analysed because I was informed that the provenance of the remaining material was no longer certain (Dr Keryn Walshe 2015, pers. comm.). Similarly, the abalone (*Haliotis laevigita*) and cockle shell (*Katelysia scalarina*; Cane 1995:37) were not available to be viewed, preventing, for example, an analysis of their maturity in order to indicate their potential use as a food source. Marun excavated a total of 2563 lithics but according to calculations from his report only 685 derived from the time period of this study (c. 40,000–5000 BP) (Marun 1972:553). Of these 685 lithics, 128 (19%) were from the provenanced trench E3 (which spanned c. 40,000 BP–near present). The inability to analyse the other 557 lithics restricted the comparison of some aspects of Marun's (1972) results, such as the typologically classified artefacts.

The remaining 1878 lithics derived from c. 5000 BP to the present (Marun 1972:553), which is outside the time period of focus. The 1878 lithics represent, however, a concentration in the mid-late Holocene, which in itself likely reflects a form of behavioural change. Yet only 268 of 1256 lithics from Cane's (1995) assemblage date from the mid-late Holocene. The lack of provenance data prevents the assessment of hypotheses such as that different activity areas existed within the rockshelter. No provenance issues existed for the 1256 lithics from Cane's (1995) assemblage (20 were, however, identified as non-artefactual [Chapter 6]), 988 of which were from c. 40,000–5000 BP. Adding Marun's (1972) 128 lithics, the Allen's Cave sample size totals 1116/1673 (67%).

1.10 Traditional Owners

In 2013 a native title determination was made by Justice Mansfield in the Federal Court of Australia recognising native title over a broad far west South Australian coast region that encompasses Allen's Cave (Figure 1.4; Far West Coast Native Title Claim v State of South Australia (No.7) [2013] FCA 1285). The determined area is now cared for by the FWCAC, which has permitted and supported this research (Chapter 5 [5.1]).

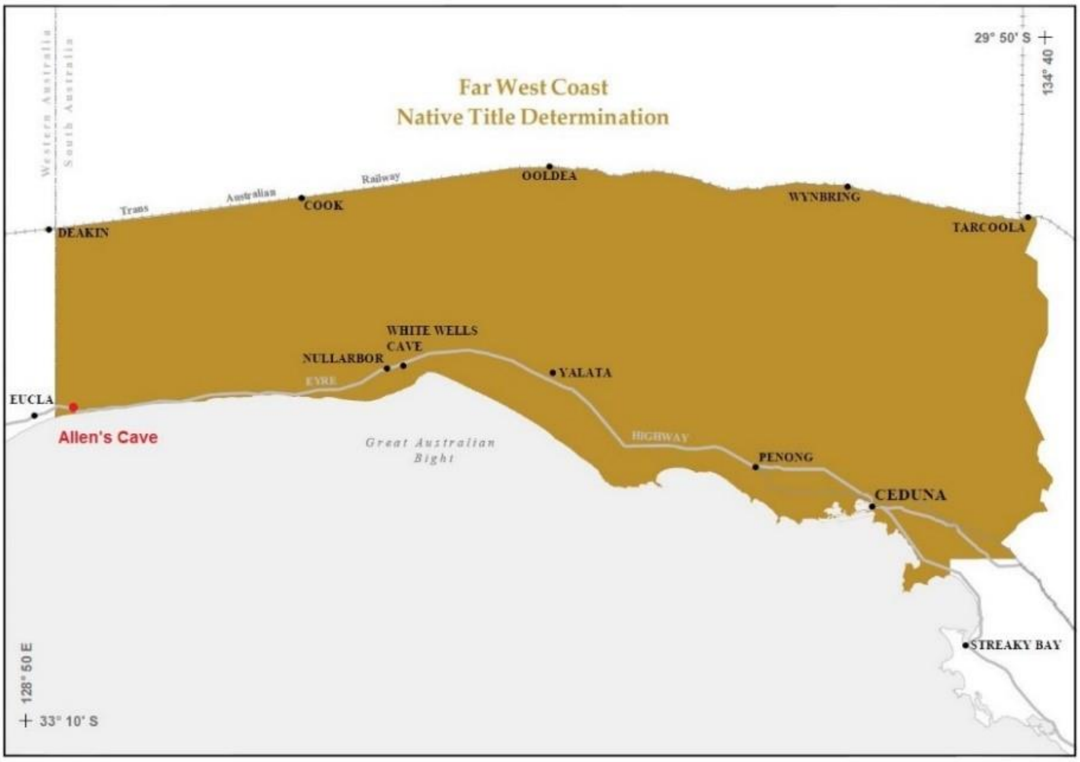


Figure 1-4 The Far West Coast Consent Determination Area.

1.10.1 Ethical Research Relating to Traditional Owners

The discipline of archaeology has in recent decades faced criticism from a number of Aboriginal Australians for failing to sufficiently and appropriately consult with them. Inadequate consultation has at times resulted in a selective presentation of the past where the perspectives of Indigenous peoples are suppressed (Roberts 2003:1; Roberts et al. 2005; see e.g. Langford 1983). The importance of appropriate consultation has, however, been increasingly acknowledged. The peak representative body, the Australian Archaeological Association (AAA), for example, emphasises community consultation in its contemporary code of ethics:

> Members will negotiate and make every reasonable effort to obtain the informed consent of representatives of the communities of concern whose cultural heritage is the subject of investigation. Members cannot assume that there is no community of concern.
>
> Australian Archaeological Association 2015, Code of Ethics, article 1.2

Principles of ethical research are described by the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS), one of Australia's major institutions concerned with the study of Aboriginal people. A fundamental principle is identifying the appropriate regional organisation(s) and traditional owner(s) who speak for Country (AIATSIS 2012). Another is to provide the appropriate traditional owners with the ability to be involved at a level according to their wishes, based on free, informed consent, and the right to withdraw this consent for any reason at any time without negative consequences (AIATSIS 2012). Any consultations must include clear discussions at the beginning about the project's significance as well as ongoing, full discussion about aims, methods and outcomes (AIATSIS 2012). The involvement of the local Aboriginal community and the implementation of the principles of ethical research are described in Chapter 5.

1.11 Thesis Outline

The remainder of this thesis consists of seven chapters followed by Appendices. Chapter 2 discusses the two hypotheses concerning Aboriginal people's responses to intensified aridity, while Chapter 3 synthesises current knowledge about past environmental conditions. The previous lithic analyses, by Marun (1972) and Cane (1995), are discussed in Chapter 4, providing the basis for subsequent comparisons, while the methods used in the present analysis are detailed in Chapter 5. Chapter 6 provides the results from before, during and after the LGM and early Holocene, and Chapter 7 discusses their implications for the research questions and aims. Chapter 8 presents conclusions and suggests avenues for future research. The Appendices provide additional contextual information and the full data set obtained from artefact analysis.

1.12 Chapter Summary

A technological analysis of Allen's Cave lithics can provide new understandings about past human behaviour. This study uniquely focusses on possible responses in stone technology to key environmental fluctuations, including the LGM, whose timing palaeoenvironmental research has refined since previous analyses by Marun (1972) and Cane (1995). The testing of major hypotheses by Veth (1989) and Hiscock and Wallis (2005) concerning human adaptations to climatic changes has the potential to further our knowledge about the use of Australia's arid zone.

Chapter 2: Models of Aboriginal Responses to the Last Glacial Maximum in Australia's Arid Zone

This chapter begins with a brief description of variations in the occupation of Australia's arid zone during the LGM. Two major arid zone settlement models are then discussed: Veth's (1989) 'refuges, barriers and corridors' and Hiscock and Wallis's (2005) 'desert transformation.' The manner in which the analysis of the Allen's Cave lithics may contribute to a consideration of these models is described.

2.1 Variations in Australian Arid Zone Occupation Patterns during the Last Glacial Maximum

Many locations within Australia's arid zone had been occupied by humans for several millennia before the LGM. During the period of hyper-aridity, however, some of these sites were rarely used or abandoned altogether while others remained inhabited for all or the majority of the time (Table 2.1). Puritjarra (Figure 2.1) in central Australia, for example, appears to have been occupied throughout the LGM based on the presence of artefacts in all of the LGM deposits (Smith 1989, 2009; Smith et al. 1997). Djadjiling (Figure 2.1), in the Pilbara, was likely sporadically occupied during the LGM—this in inferred due to the fact that only 370 of a total of 1315 lithics recovered for the duration of human occupation, from c. 35,000–2700 BP, were from the period 35,000–14,000 BP (Law et al. 2010:69–70). Law et al. (2010) did not outline exact quantities of lithics or other archaeological evidence specifically for the LGM; however, their section drawing of the rockshelter indicates an absence of cultural material throughout the period and they inferred 'intermittent site use during the LGM' (Law et al. 2010:70).

The presence or absence of archaeological material does not always reflect the extent of human occupation. A range of potential issues influence artefact quantities, including taphonomic factors (Clarkson 2007:130–134), adaptations by people in their use of the landscape (Lourandos 1985:411) and variations in intra-site artefact discard locations (Attenbrow 2004:29). An assessment, however, of all archaeological evidence at a site, such as faunal material, lithics, middens and hearths in conjunction with anthropogenic sediment deposition, can provide a foundation for estimations of human activity based on current knowledge (Attenbrow 2004:15; Barker 1991:105–107; Clarkson 2007:134; David and Chant 1995:214; Hiscock 1981; Mulvaney and Kamminga 1999:272; Smith 2006:402). Within this context, Table 2.1 displays some Australian arid zone sites that have been the focus of relatively extensive research and constitute examples of partial or continuous LGM occupation or of abandonment. The sites' locations are shown in Figure 2.1.

Table 2-1 LGM occupation patterns at a sample of Australian arid zone sites.

Site	Initial Human Occupation (c. BP)	Cultural Material During LGM	Inference re Extent of LGM Occupation	References
Puritjarra	40,000	All LGM layers	Throughout	Smith 2005:228; Smith 2006:374–379; Smith 2009:748; Smith et al. 1997
Lawn Hill	35,000	All LGM layers	Throughout	Hiscock 1988:243–244; Hiscock 2008:59–60
Fern Cave	25,000	All LGM layers	Throughout	Lamb 1996
Milly's Cave	30,000	Some LGM layers	Sporadic	Marwick 2002:25; Slack et al. 2009:32–33
Djadjiling	35,000	LGM layers unspecified but 370 lithics were excavated for c. 35,000–14,000 BP, compared to the total of 1315 lithics for c. 35,000–2700 BP	Sporadic	Law et al. 2010
Carpenter's Gap	45,000	'Little or no cultural material'	Abandoned or virtually abandoned	Fifield et al. 2001:1144; Hiscock et al. 2016:2–6, 10; O'Connor 1995:59
Riwi	45,000	Culturally sterile	Abandoned	Marwick 2002:22
Mandu Mandu Creek	35,000	Culturally sterile	Abandoned	Morse 1988, 1993, 1999
Kulpi Mara	34,000	Culturally sterile	Abandoned	Thorley et al. 2011

2.2 Refuges, Barriers and Corridors

Veth (1989) sought to explain the LGM occupation variations by arguing that arid zone people responded to the intense environmental change by settling in ‘refuges,’ consisting of piedmont/montane uplands or riverine gorge systems with reliable water supplies. They avoided ‘barriers’ in the form of the great sandy deserts by traveling through ‘corridors’ consisting of all other types of land, such as desert lowlands and gibber plains (Veth 1989). Occupation of corridors entailed restricted foraging areas and a reliance on local resources (Veth 1989). Under this model Allen’s Cave would have been a corridor during more favourable conditions (early Holocene) but a barrier to settlement during harsh times (LGM). Allen’s Cave was situated in neither piedmont/montane uplands nor a riverine gorge system and it lacked a permanent water supply (Gillieson and Spate 1992:65, 70, 86–88), although several small rock holes have been documented (Cane 1995:2; Wright 1971c:2).

Veth’s (1989) biogeographic classifications have, however, received some criticism. Smith (1993:37–42) argued that the great sandy deserts should not have been grouped together as ‘barriers’ because their vegetation, moisture, landform and other characteristics differed considerably, while Frankel (1993) and Walshe (1994:266–276) doubted that Veth’s (1989) ‘less than two dozen’ (Frankel 1993:28) sites was a sufficient number to represent such a vast area.

Regardless of these criticisms, the lithic record at Allen’s Cave provides an opportunity to test Veth’s (1989) hypothesis. If Allen’s Cave was a barrier to human occupation during the LGM this should be reflected by an absence of cultural material for this period. During the more favourable early Holocene, however, there should, according to Veth (1989), be a relative abundance of lithics and other archaeological material and a reliance on local raw materials.

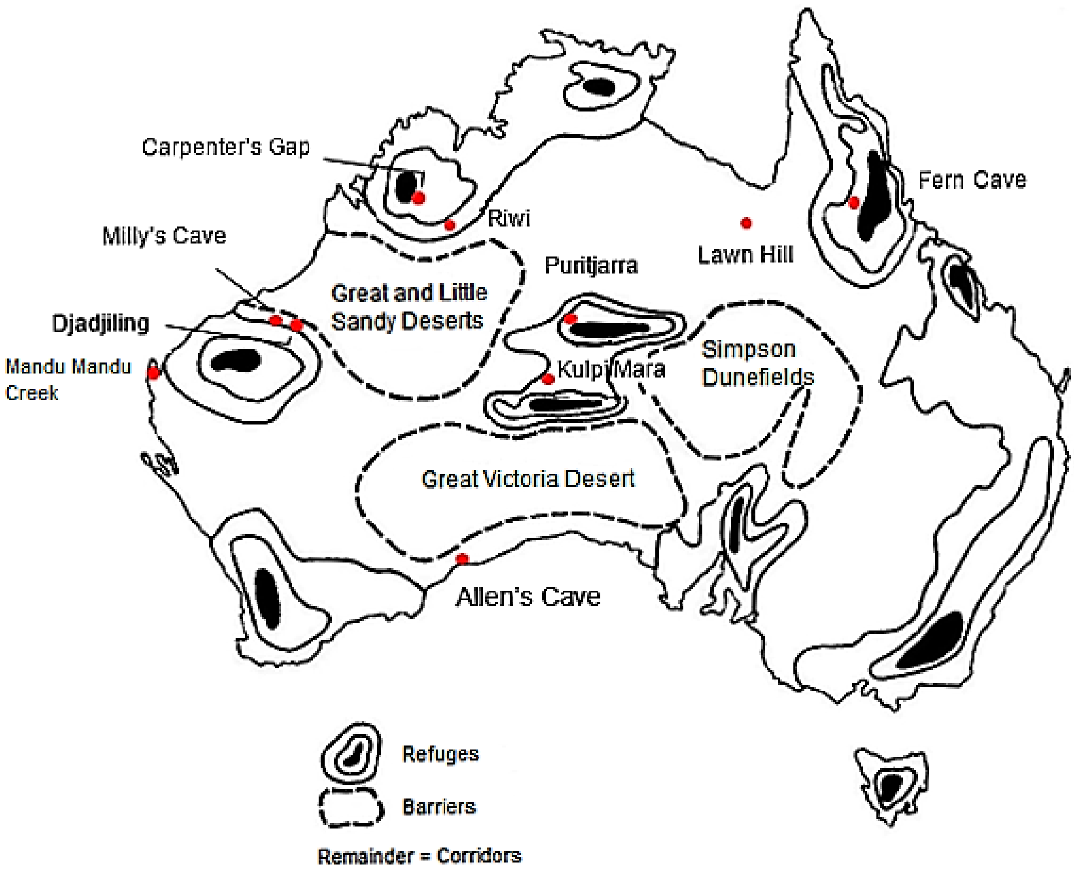


Figure 2-1 'Refuges, barriers and corridors' and other sites mentioned in the text. Adapted from Veth (1989).

2.3 Desert Transformation

In their 'desert transformation' model, Hiscock and Wallis (2005:37–42) argued that when people had initially occupied much of Australia's arid zone several millennia before the onset of the LGM, environmental conditions were more favourable, with reasonably abundant and predictable riverine and lacustrine resources. Hiscock and Wallis (2005) reached this conclusion based on their analysis of marine cores, terrestrial lake sequences and botanic materials from their study areas of the Kimberley and Australia's north-west region, the Lake Eyre Basin and Willandra Lakes. Under the desert transformation model, people had developed such familiarity with and skills in exploiting their local environments before the LGM that their adaptations to heightened aridity needed only to be relatively minor (Hiscock and Wallis 2005:49–50).

The gradual increase of aridity in Australia’s arid zone supports the argument of Hiscock and Wallis (2005) that conditions at initial colonisation were more advantageous than during the LGM. Aridity began to heighten significantly across the continent around 35,000 BP (e.g. Fitzsimmons et al. 2013:79; Veth et al. 2011a:205) and the hyper-arid conditions of the LGM commenced around 30,000 BP (Clark et al. 2009:710; Fitzsimmons et al. 2013:91; Lambeck and Chappell 2001:683; Lambeck et al. 2002; Lambeck et al. 2014:15296; Miller et al. 1997; Petherick et al. 2008:800; Smith 2013:119, 154). Human occupation at Allen’s Cave, beginning at 39,800 ± 3100 BP (Roberts et al. 1996:15), therefore pre-dated significant increases in aridity by several millennia and the LGM by approximately 10,000 years.

Comparison of any changes between the pre-LGM lithics recovered from Allen’s Cave with those during the LGM has the potential to test the desert transformation model. The extent of any technological change can be considered in light of the argument that only ‘minor’ changes occurred upon the onset of hyper-aridity (Hiscock and Wallis 2005). Although lithic technology is only one of many aspects of human behaviour considered by the model, stone artefacts are the predominant remaining evidence available to examine from Allen’s Cave (and elsewhere) because of their outstanding preservation, and lithics were a vital everyday factor in past people’s lifeways (Andrefsky 2009:65; Clarkson 2007:1; Clarkson 2008:491; Clarkson and O’Connor 2006:160, 199; Flenniken and White 1985; Holdaway and Stern 2004:1; Shafer 2008:1584).

2.4 Chapter Summary

Veth’s (1989) model concerning human responses to the LGM and other climatic fluctuations was based on evidence from a limited number of sites. Allen’s Cave is an ideal addition to the testing of the hypothesis, because human occupation in this marginal desert location spanned significant, contrasting climate changes. Results may support Veth (1989) or add to existing doubts (e.g. Frankel 1993; Walshe 1994:266–276) about the pan-continental applicability of his model. Either outcome will help to advance our understandings about how Aboriginal people used the Australian arid zone. As humans had occupied Allen's Cave for several thousand years prior to the onset of hyper-aridity, the presence and extent of any changes in the LGM lithics is well placed for testing the Hiscock and Wallis (2005) concept of 'minor changes' in response to hyper-aridity.

Chapter 3: The Palaeoclimate and Value of Related Lithic Analysis

This chapter examines the influence of the environment on past human behaviour and how lithic analysis may inform us about responses to such fluctuations. The nature and temporality of climatic conditions around Allen's Cave since its initial human occupation is synthesised.

3.1 Environmental Factors as an Influence on Human Behaviour

Many factors contribute to changes in human behaviour over time, such as social/cultural, political and economic considerations (e.g. Brady and Bradley 2014:366–376; Jones 1995:427–428; McNiven 1994; Ross 2013). The Australian arid zone, however, was such a severe environment during the LGM—with Allen's Cave in the most arid part of the arid zone (Hesse et al. 2004:87; Veth 2005:100)—that survival in it depended on being able to adapt to a forbidding and fluctuating climate. Even relatively minor environmental changes in aspects such as effective precipitation, temperature and humidity can have dramatic effects on populations (Lomax et al. 2010:723), by altering ecosystems upon which they relied. Allen's Cave saw extreme climatic fluctuations (the LGM) and a relatively lesser-scale change (to improved conditions in the early Holocene).

This is not to infer that a simple causal relationship between environmental fluctuations and human behaviour always exists. Changes or continuity in human behaviour may coincide with environmental episodes but be in part due to other influences. Archaeologists have argued, for example, that cultural changes occurring over many regions of Australia during mid-late Holocene environmental variability were the result of a range of factors—with debates occurring over the extent of influences such as intensification and social, linguistic and political dynamics (e.g. Brian 2006; David and Chant 1995; Lilley 2001; Lourandos 1983, 1985; Lourandos and Ross 1994).

In this study, however, the potential extent of climatic factors is considered because of the extreme conditions of the LGM and the contrasting environment of the early Holocene. The deep antiquity of Allen's Cave means that ethnographic records could not be reliably extrapolated to represent behaviour during the vast majority of the human occupation of the rockshelter. Allen's Cave does not contain other archaeological evidence, such as rock art, which at a range of other sites has informed discussions about cultural influences on human behaviour (e.g. Balme et al. 2009; Brady and Bradley 2014:366–376; Chaloupka 1993; Chippendale et al. 2000; Clegg 1987; Layton 2009; McDonald 2005; Mulvaney 2013; Rosenfeld 1982; Ross 2013; Taçon and Ouzman 2004; Tasire and Davidson 2015).

Analysis of the lithics from many millennia either side of the LGM and early Holocene nevertheless provides the opportunity to identify technological changes that may have occurred during periods of stable climate. Risk minimisation strategies among past foragers varied over time and place and were not solely determined by climatic conditions (e.g. Boydston 1989; Jeske 1989; Torrence 1989a and b). The approach of this thesis therefore differs from earlier, environmentally deterministic studies, such as Meggers (1960), who argued that understanding environmental conditions and past people's technology was all that was necessary to infer people's behaviour.

A number of studies, both in Australia and internationally, have, however, demonstrated possible causal links between climatic fluctuations and human behaviour. Such links have been explored since the approach gained traction around the early twentieth century, particularly in Europe and America (Trigger 2006:315–319). Kennett et al. (2012), for example, identified that political upheavals and population changes occurred over the last 2000 years in Mayan society and agricultural activity intensified during times of drought and other environmental fluctuations.

For the Australian arid zone, Smith et al. (2008) conducted a time-series and spectral analysis using probability distribution plots of 971 radiocarbon dates of archaeological material from 286 sites, including from the Nullarbor, as proxies for population estimations. Their data indicated sharp rises and falls in archaeological material, rather than smooth transitions, commensurate with environmental changes. This included an overall increase in such material following the LGM as the climate ameliorated (Smith et al. 2008:395, 399). Similarly, Turney and Hobbs (2006) found a 'dramatic' increase in Queensland archaeological material and a change in people's subsistence strategies that were 'statistically indistinguishable' from the local El Niño-induced environmental changes at 5000 BP. People used coastal environments more extensively and expanded their foraging ranges in order to procure resources for a greater population (Turney and Hobbs 2006:1747). In Queensland's Albatross Bay, Morrison (2013:88–90) found that Aboriginal people strategically exploited natural inter-annual and intra-annual fluctuations in estuarine resource availability as they occurred.

3.2 The Relationship between Lithic Technologies and Environmental Changes

Technological adaptations made during times of environmental change could be manifest in several ways, such as a reliance on a certain kind of tool. Hiscock (1994, 2002), for example, hypothesised that people in south-eastern Australia during the mid-Holocene heightened aridity and marine transgressions, foraged further into previously unexplored regions, minimising risks by adjusting their stone tools to include backed artefacts and points. Backed artefacts had been used previously, such as at Mussel Shelter in New South Wales from 8345 ± 155 BP (Attenbrow et al. 2009:2766, 2768; Hiscock and Attenbrow 1998) and at various Pleistocene sites (Flenniken and White 1985:149; Hiscock 2014:124; Hiscock et al. 2011:656; Robertson et al. 2009:296; Slack et al. 2004:131–132, 134–136). During the mid-Holocene, however, there was a 'proliferation' of backed artefacts and points because, according to Hiscock (1994, 2002), these lithics are multifunctional, highly durable and portable. Such traits minimised risks associated with new and extended foraging ranges (Hiscock 1994, 2002).

Other technological adaptations may have been made at times of environmental changes. Differences, for example, in the exploitation of lithic raw materials could reflect expansion or constriction of foraging ranges and/or possible trade/exchange systems. Evidence for such behaviour exists in many parts of the world, such as Australia, North America, Hungary, and in European Palaeolithic industries (Biró 2009:49–52; Clarkson and O'Connor 2006:198; McBryde 1987; McCarthy 1977; Meignen et al. 2009:1821; Randolph 2001; Roth 1897; Smith 2013:269–274; Tibbett 2006:29–30). Changes in the lithic discard rate may indicate adaptations relating to the intensity of site use (Clarkson 2008:492–498; Holdaway and Porch 1995; Walshe 1994:254), if corroborated by other archaeological evidence such as faunal material, hearths and manufacturing techniques (Attenbrow 2004:29; Hiscock 1981; Ross 1984:200, 1985:83; Walshe 1994).

3.3 Environmental Conditions c. 40,000–30,000 BP

From initial human occupation until 30,000 BP, environmental conditions in the Allen's Cave region were, like for much of Australia at this time, less arid and more favourable than during many subsequent millennia (Hiscock 2008:53; Hiscock and Wallis 2005:39–41; Veth et al. 2011a:218). The rockshelter has, however, always been in one of the more challenging environmental regions in the country (Martin 1973; Smith 2013:151–152). Allen's Cave has never been near any permanent water source, with the Nullarbor being extremely porous and lacking in sand drifts or soils able to retain water in reservoirs (Cane 1995:39, 44; James et al. 2012:571). The rockshelter's southern location prevented it from receiving moisture from the northern Australian summer monsoon (Bowler et al. 2001:63; Hesse et al. 2004:87–91; Ward et al. 2005:1907–1908), and at initial occupation the nearest reliable source of water was likely in wells in coastal sands, around 100 km south (Martin 1973; Smith 2013:88–89).

Between around 35,000 BP and 30,000 BP aridity began to increase across much of Australia, albeit not to the extent of LGM millennia (Hesse et al. 2004:97; Reeves et al. 2013:27; Veth et al. 2011a:205). Heightened aridity has been demonstrated by pollen analysis reflecting an increase in arid-adapted vegetation (Martin 1973:294, 300) and by palaeohydrological reconstructions, such as those undertaken at South Australia's Lake Frome (Cohen et al. 2012:106). By 30,000 BP the onset of hyper-aridity had begun.

3.4 The Last Glacial Maximum: 30,000–19,000 BP

As its name suggests, the LGM is generally taken to refer to the period when world glaciation was at its most recent peak (e.g. Clark et al. 2009:710; Ehlers and Gibbard 2007:12–13; Fitzsimmons et al. 2013:91; Hughes et al. 2013:172; Lambeck and Chappell 2001:683; Rutter et al. 2012:44–45; Yokoyama et al. 2000:713). Until relatively recently the LGM was thought to have commenced between approximately 26,000 BP and 24,000 BP, lasting until around 18,000–17,000 BP.

Increasing evidence, however, including an analysis of southern hemisphere sea levels and global ice sheets, suggests that the hyper-aridity in Australia, which was the effect of the extensive global glaciation, peaked from c. 30,000–19,000 BP (Fitzsimmons et al. 2013:91; Lambeck and Chappell 2001:683; Lambeck et al. 2002:349; Lambeck et al. 2014:15296; Petherick et al. 2008:800). Beginning at around 30,000 BP, sea levels fell 40 m–50 m over only 1000–2000 years and remained at this lowered level throughout the LGM (Lambeck et al. 2002:359; Lambeck et al. 2014:15296). Australian temporal zone proxies suggest that hyper-aridity was particularly pronounced from c. 24,000–18,000 BP (Petherick et al. 2013:59, 65–72; Shulmeister et al. 2016:1440). Some regional differences occurred across the world in the exact timing of peak glaciation. In western Canada, for example, the Cordilleran ice sheet was at its maximum at c. 20,000 BP (Rutter et al. 2012:44–45), while in areas in South America, Asia and northern Eurasia, ice sheets peaked before 30,000 BP (Hughes et al. 2013:179, 184, 191).

The intensity of arid conditions in Australia throughout the LGM was never previously or since encountered by Aboriginal people (Hesse et al. 2005:66; Smith 2013:110; Thorley 1998:36). A virtually worldwide phenomenon, the LGM was manifest in Australia not by massive ice sheets as was the case for approximately 30% of the earth's surface, as glaciation was limited to south-eastern Australia and Tasmania (Hughes et al. 2013:187; Petherick et al. 2013:64). Instead the LGM in Australia was characterised by a vast expansion of deserts and dryness, with widespread dune activity occurring, such as at Olympic Dam in South Australia, where sand accumulation was at its most rapid from 30,000–21,000 BP (Hughes et al. 2014:28). Over much of Australia a vast reduction occurred in vegetation and effective precipitation, with overall arid zone rainfall at 30%–50% less than that of today (Dodson and Wright 1989; Ross et al. 1992; Singh and Geissler 1985) and evaporation rates approximately 20% higher (Bowler and Wasson 1984:205). Pollen evidence also demonstrates a lack of organic sedimentation (Kershaw 1995:661; Martin 1973:294, 300–302).

Various regional climatic differences occurred across Australia during the LGM (Fitzsimmons et al. 2013:90–92; Hiscock 2008:58; Hughes et al. 2013; Jones and Bowler 1980; Smith 2013:110, 120; Thorley 1998:35; Veth 1989:81). Many semi-arid areas became arid and northern Australia, for example, no longer received the northern monsoon (Dodson and Wright 1989:191; Johnson et al. 1999). Temperatures across much of southern Australia were 6°C–10°C lower than today (Kershaw 1995:660; Miller et al. 1997:242–244), severely restricting plant growth (Fitzsimmons et al. 2013:91; Hesse et al. 2004:95; Hesse et al. 2005:66–72). Around Allen's Cave, pollen evidence shows that arid-adapted, salt-tolerant chenopod vegetation, such as salt bush and blue bush, was dominant during the LGM (Martin 1973:294, 300). The chenopods included 33 taxa from the Chenopodiaceae family and several from the Amaranthaceae family (Appendix 3).

Throughout the LGM, Allen's Cave was well inland (Cane 1995; Martin 1973). Sea levels (Figure 3.1) were approximately 120 m–130 m lower than at present (Allen and O'Connell 1995:856; Lambeck et al. 2002:343; Pillans and Bourman 2001:95; Yokoyama et al. 2001:11), resulting in Allen's Cave being 160 km from the coast at 20,000 BP (Martin 1973:287; Turney et al. 2001:782). Oceanographic evidence also demonstrates that the Leeuwin Current, the major current that normally flowed into the Great Australian Bight region, did not do so during the LGM, resulting in colder water which likely contributed to the reduction in effective precipitation and water availability around this region (McGowran et al. 1997:30–31, 35; Pillans and Bourman 2001:95).

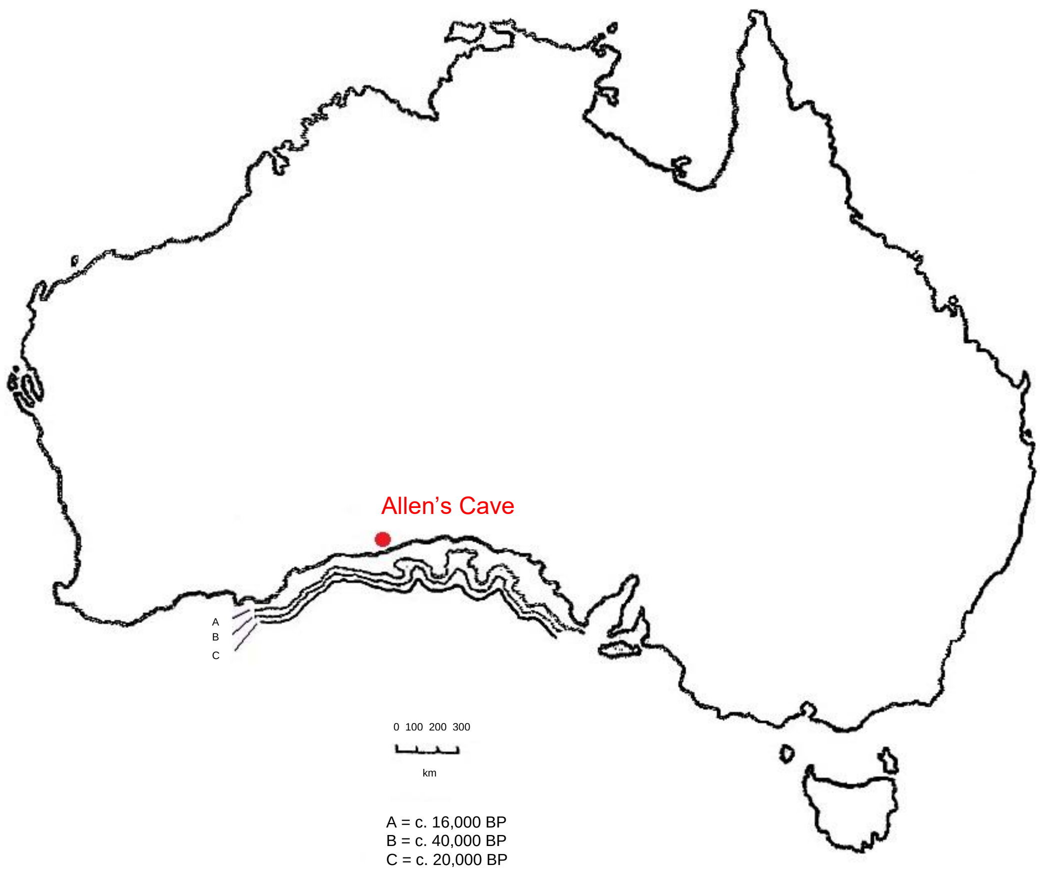


Figure 3-1 Sea levels around Allen's Cave: modern coastline, c. 16,000 BP, c. 40,000 BP and c. 20,000 BP. Adapted from Monash University website: http://sahultime.monash.edu.au/explore.html.

3.5 Post Last Glacial Maximum to Early Holocene: 19,000–11,000 BP

During the period from 19,000–11,000 BP the southern Australian arid zone climate ameliorated. As aridity gradually decreased (Fitzsimmons et al. 2013:83–84; Hiscock and Wallis 2005:46; Kershaw 1995:665), temperatures rose and conditions overall were more stable and humid (Reeves et al. 2013:28). Effective precipitation increased, as indicated by proxies such as speleothem growth in South Australia's Flinders Ranges, a highstand in the level of Lake Frome from 18,000–16,000 BP (Cohen et al. 2011; Fitzsimmons et al. 2013), and a reduction in salinity at Lake Frome. The reduction in salinity was demonstrated by the presence of ostracod *Moina* sp., which requires moderate salinity and did not exist in the previous higher levels of salinity, and by the formation of a brine pool below the lake (De Deckker et al. 2011:47).

During the period 19,000–11,000 BP conditions had improved from the LGM but were not as favourable around Allen's Cave as they were during the early Holocene. Allen's Cave remained around 80 km from the coast for most of the deglacial millennia, limiting rainfall received in comparison to the early Holocene, and the Leeuwin Current was not yet re-activated (Reeves et al. 2013:28). Pollen analyses demonstrated an increase of mallee scrub in the region, with a proportionate decrease in chenopods which thrive in higher aridity, but this was gradual (Martin 1973:294–296). Aeolian activity in southern arid zone areas decreased from c. 18,000–14,000 BP, then temporarily increased again from c. 14,000–11,000 BP, indicating a potential fluctuation in aridity, albeit not approaching LGM levels (Fitzsimmons et al. 2013:83–84; Reeves et al. 2013:28).

3.6 The Early Holocene: 11,000–8000 BP

The early Holocene brought more stable and improved conditions around the Allen's Cave region (Cane 1995:17, 23, 26, 27, 44; Kershaw 1995:668; Martin 1973:300–302; Smith 2013:176; Turney et al. 2001:782). As a result of the continued marine transgression (e.g. Short 1988:120, 134–135), Allen's Cave was now in a more favourable mallee woodland setting approximately 10 km from the coast (Cane 1995:17, 23, 24, 27, 44; Horton 1981:26; Martin 1973:288, 300–302; Turney et al. 2001:782). Pollen analysis undertaken from cores extracted from deposits within Allen's Cave demonstrated that the vegetation change, caused by increased effective precipitation, was particularly pronounced from between 10,000–9000 BP and 5000 BP (Martin 1973:301; Turney et al. 2001:782).

A corresponding faunal change also occurred. Before the early Holocene, animals which had survived the harshest periods of Pleistocene aridity and were adapted to an open plain environment were dominant (Martin 1973:300–301; Prideaux et al. 2007:422, 424). By the beginning of the early Holocene, the majority of fauna was species more suited to shrub land (Martin 1973:300–301). Owls (particularly the Masked Owl, *Tyto novaehollandiae*), for example, had visited the site previously but were now the dominant depositors of small to medium faunal remains (Walshe 1994:260). Aboriginal people continued to concentrate on small to medium prey as the generations had since initial occupation (Walshe 1994:257–260). There is no direct evidence that inhabitants concentrated on any particular prey or deposited more faunal remains at a different rate during the Holocene than they had during the Pleistocene (Walshe 1994:237–260).

Evidence for relative climate stability at Allen's Cave around the early Holocene is consistent with other parts of South Australia's central-southern arid zone. Increased effective precipitation is indicated by proxies such as a rise in alluvial and flood deposits in the Flinders Ranges (Gliganic et al. 2014:114) and archaeological evidence from Olympic Dam, which revealed 'close parallels' (Hughes and Sullivan 2014:42) with temporary occupation phases and the timing of wetter conditions at c. 200 km distant Lake Frome. The Leeuwin Current resumed its flow into the Great Australian Bight and South Australian sea levels rose rapidly at approximately 1.5 cm per year until they stabilised at c. 6400 BP, evidenced by a time-depth study of 233 fossil indicators (Belperio et al. 2002:163).

3.7 Post Early Holocene: c. 8000 BP–Present

Evidence for the nature of environmental conditions around the Allen's Cave region after the early Holocene is minimal. A plethora of climate proxy records exists for a wide range of localised Australian regions, indicating fluctuations in aridity, varied affects from mid-Holocene El-Niño conditions, marine transgressions and climatic amelioration (e.g. Cohen et al. 2012; Gagan et al. 2004; Haberle and David 2004; Lee and Bland 2002; Lomax et al. 2010; Marx et al. 2009; Marx et al. 2011; McKirdy et al. 2013; Quigley et al 2010:1100–1102; Reeves et al. 2013; Shulmeister and Lees 1995; Turney and Hobbs 2006). With most climate proxy records relating to other more distant areas, however, it is problematic to extrapolate these for the Allen's Cave region. The palaeoclimate for the Allen's Cave region since its initial human occupation is broadly summarised in Table 3.1.

Table 3-1 The palaeoclimate and proximity to coastline of the Allen's Cave region since initial human occupation.

BP	Period	Description	References
40,000 to 30,000	Initial human occupation to onset of LGM	• 100 km from the coast • Arid but relatively favourable environmental conditions until gradual increase in aridity from around 35,000 BP • No known nearby permanent water source • Predominance of arid-adapted fauna	Cohen et al. 2012 Gillieson and Spate 1992 Hesse et al. 2004 Hiscock 2008 Hiscock and Wallis 2005 Martin 1973 Reeves et al. 2013 Veth et al. 2011a Walshe 1994
30,000 to 19,000	LGM	• Intensely heightened aridity, with vast reduction in effective precipitation; particularly pronounced c. 24,000–18,000 BP • Inland throughout due to global sea levels being around 130 m below present level • 160 km from the coast at c. 20,000 BP • Sea levels fell by 40 m–50 m over a 1000 to 2000 year period beginning at 30,000 BP • Extreme dryness, reduction in vegetation, colder • Predominance of arid-adapted fauna • No known nearby permanent water source	Allen and O'Connell 1995 Bowler and Wasson 1984 Dodson and Wright 1989 Fitzsimmons et al. 2013 Gillieson and Spate 1992 Hesse et al. 2005 Hiscock 2008 Hiscock and Wallis 2005 Hughes and Sullivan 2014 Jones and Bowler 1980 Kershaw 1995 Lambeck and Chappell 2001 Lambeck et al. 2002 Lambeck et al. 2014 Martin 1973 McGowran et al. 1997 Miller et al. 1997 Petherick et al. 2008 Petherick et al. 2013 Pillans and Bourman 2001 Ross et al. 1992 Shulmeister et al. 2016 Singh and Geissler 1985 Smith 2013 Thorley 1998 Veth 1989 Walshe 1994 Yokoyama et al. 2001
19,000 to 11,000	Post LGM to Early Holocene	• Overall reduction of aridity • Still part of harsh inland plain • At 14,700 BP the coast was 65 km away • No known nearby permanent water source • Predominance of arid-adapted fauna	Fitzsimmons et al. 2013 Gillieson and Spate 1992 Kershaw 1995 Martin 1973 Walshe 1994
11,000 to 8000	Early Holocene	• Improved effective precipitation • Sea-level rise: coast now 10 km away and Allen's Cave in coastal woodland setting • Dramatic vegetation change from chenopod varieties to mallee scrub • Faunal remains changed from a dominance of arid-adapted species to varieties suited to coastal mallee scrub • No known nearby permanent water source	Gillieson and Spate 1992 Gliganic et al. 2014 Horton 1981 Kershaw 1995 Martin 1973 Prideaux et al. 2007 Short 1988 Turney et al. 2011 Walshe 1994
8000 to near present	Post Early Holocene to near present	• Climate proxies exist for other localised regions but are unable to be reliably extrapolated for the Allen's Cave region • No known nearby permanent water source	Fitzsimmons et al. 2013 Gagan et al. 2004 Gillieson and Spate 1992 Haberle and David 2004 Lee and Bland 2002 Lomax et al. 2010 Marx et al. 2009 Marx et al. 2011 McKirdy et al. 2013 Quigley et al 2010 Reeves et al. 2013 Shulmeister and Lees 1995 Turney and Hobbs 2006

3.8 Chapter Summary

Evidence for climatic conditions around the Allen's Cave region c. 40,000–5000 BP is well established. The severity of the LGM may have had a considerable effect on the feasibility of human occupation of Allen's Cave and adjustments in the use of stone resources may have been necessary. Conversely, the early Holocene was a period of relative climatic favourability, whereby different kinds of stone technology may have been advantageous. Although past human behaviour was influenced by social, religious and other factors, an array of studies demonstrate significant climatic influences. As such, the contrasting nature of environmental conditions at Allen's Cave during the LGM and early Holocene provides an ideal foundation in which climatic fluctuations as a potential catalyst for stone technological change can be examined.

Chapter 4: Previous Research on Allen's Cave Lithics

This chapter discusses the previous Allen's Cave lithic analyses conducted by Ljubomir Marun (1972) and Scott Cane (1995). Consideration is given to their methods, results and interpretations, and efforts are made to reconcile the considerable discrepancy existing between their dates and concomitant chronologies.

4.1 The First Excavation and Analysis: Ljubomir Marun, 1972

In 1969, Ljubomir Marun excavated seven 1 m (length) x 1 m (width) trenches at Allen's Cave (Figure 4.1), using 48 arbitrary 0.1 m spits. Marun (1972:242) observed ten distinct stratigraphic layers, with a clear distinction between an upper section, consisting of layers 1–4 extending to a depth of 1.2 m, and a lower section, comprising layers 5–10 reaching 5.4 m b.s. The upper section was brown, loamy sand while the lower section was orange clay/sand (Marun 1972:242–245). In the upper section, layers two and three were particularly rich in charcoal, while the lower section was 'rich in iron oxides' (Marun 1972:246) and largely bereft of charcoal and organic matter other than bone (Marun 1972:245). Marun (1972) did not, however, record any faunal or marine remains (Walshe's [1994] faunal analysis derived from Cane's [1995] trench 'E4'). In examining the excavated lithic assemblage Marun used two separate methods, one which he described as 'traditional' and the other as 'analytical' (Marun 1972:149–181).

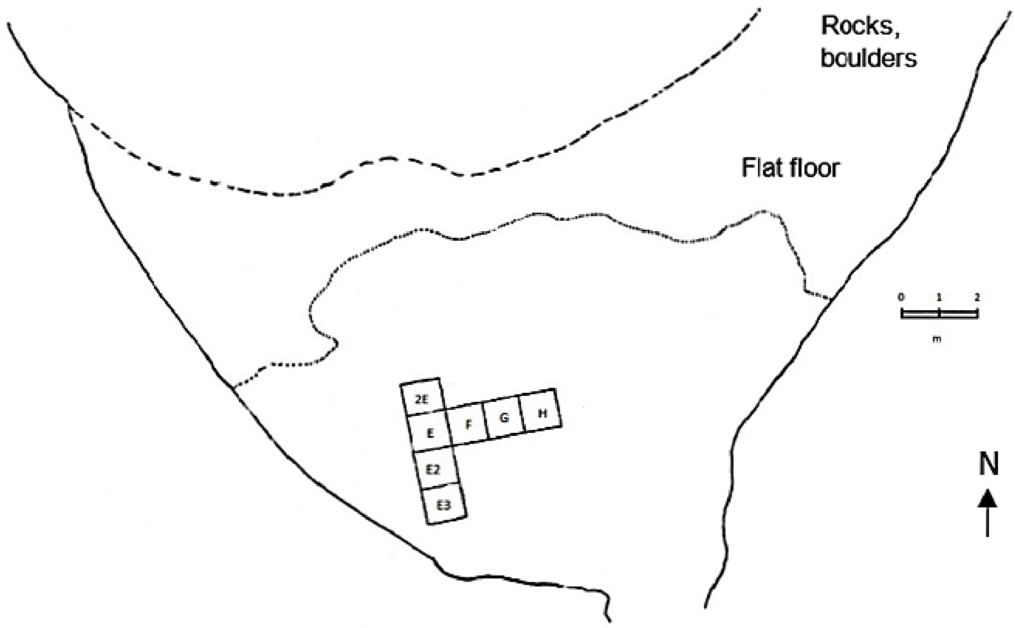


Figure 4-1 Plan view of Marun's excavation trenches within Allen's Cave. Adapted from Marun (1972:577).

4.1.2 Marun's 'Traditional Approach'

In his traditional approach (Figure 4.2), Marun (1972) sought to classify each stone artefact according to a range of attributes. He included what he termed 'by-products,' which he considered to be any artefacts without signs of wear or retouch (Marun 1972:155). Marun applied the same definition for 'by-product' to 'waste' and further subdivided 'by-products' into 'waste' and 'trimming' artefacts (Marun 1972:155; Figure 4.2). 'Trimming artefacts' resulted from the resharpening of an existing tool's blunt edge, which produced step-flaking retouch (Marun 1972:155–156). Once the edge became no longer usable it would be trimmed off to create a fresh working edge (Marun 1972:156).

Marun (1972) also emphasised the properties of the edge of each artefact. Such emphasis was corroborated by ethnographic evidence from Hayden (1977) and Cane (1992), which demonstrated that for Western Desert people a stone artefact's working edge was the priority. White's (1967) ethnographic evidence revealed that the working edge was also the primary consideration for New Guineans.

The primary basis for classifying each stone artefact was whether it had been 'functionally unaltered' or 'functionally altered' (Marun 1972:156–160, 247–251). 'Functionally unaltered' artefacts were lithics which were used without their 'random' morphology being changed. Marun defined functionally unaltered artefacts on the basis of whether their edges displayed evidence of use—a 'functionally altered' artefact was one whose shape people 'purposely altered for the sake of its function' (Marun 1972:157; Figure 4.2). 'Functionally altered' artefacts were defined according to the retouch type and could be either 'functionally restricted' (backed blades, eloueras, tulas and Bondi points; Figure 4.2) or 'functionally unrestricted' ('side scrapers,' 'double side scrapers' and 'end scrapers'; Marun 1972:154; Figure 4.2). Marun did not explicitly describe what constituted 'functionally restricted/unrestricted' but he did distinguish the two categories on the basis of the 'total shape' of each artefact (Marun 1972:160; Figure 4.2).

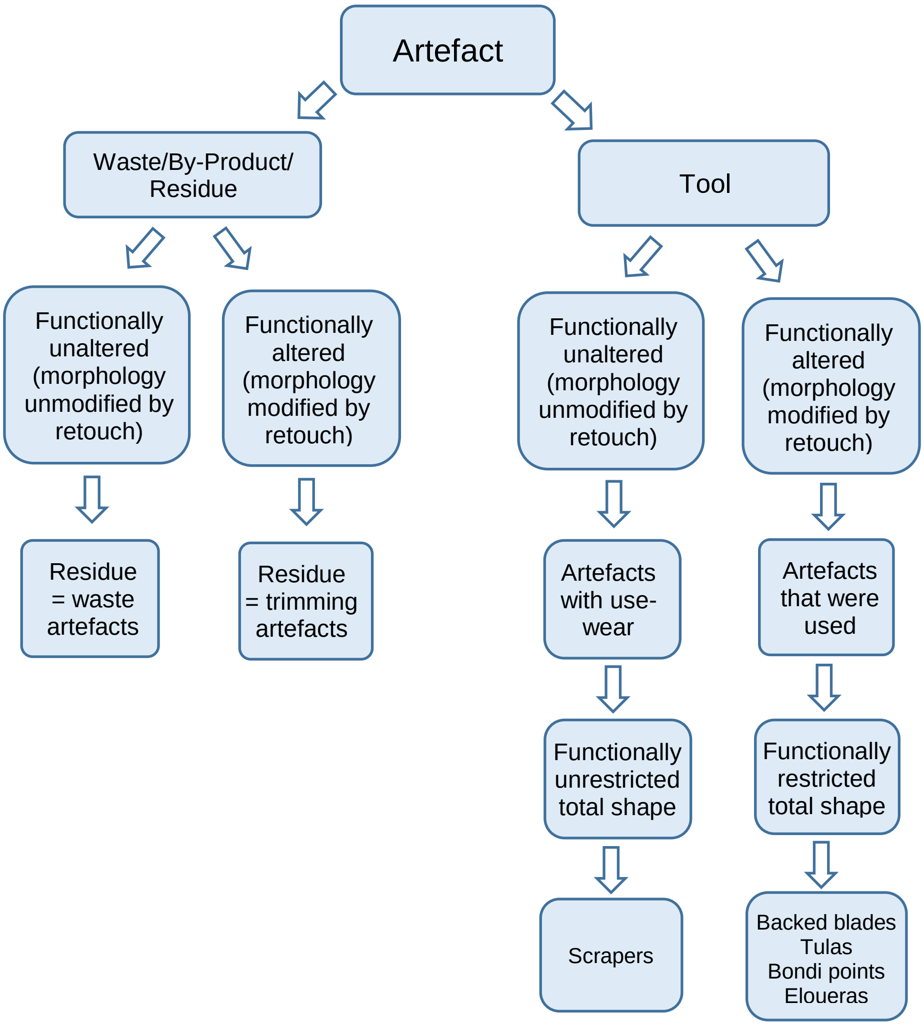


Figure 4-2 Marun's 'traditional' approach to stone artefact classification. Adapted from Marun (1972:154).

4.1.3 Marun's 'Analytical Approach'

In his analytical approach (Figure 4.3), which involved some degree of classificatory overlap with his traditional approach, Marun (1972) again focussed on the edges of each artefact but also thoroughly examined a broad range of other attributes, without assigning artefact 'types' as he did in his traditional approach (Figure 4.2). He defined an artefact as being a tool if it exhibited signs of use-wear and/or retouch or had been 'implemented' (Marun 1972:156–158), ultimately interpreting tools as constituting only 19.4% of his assemblage.

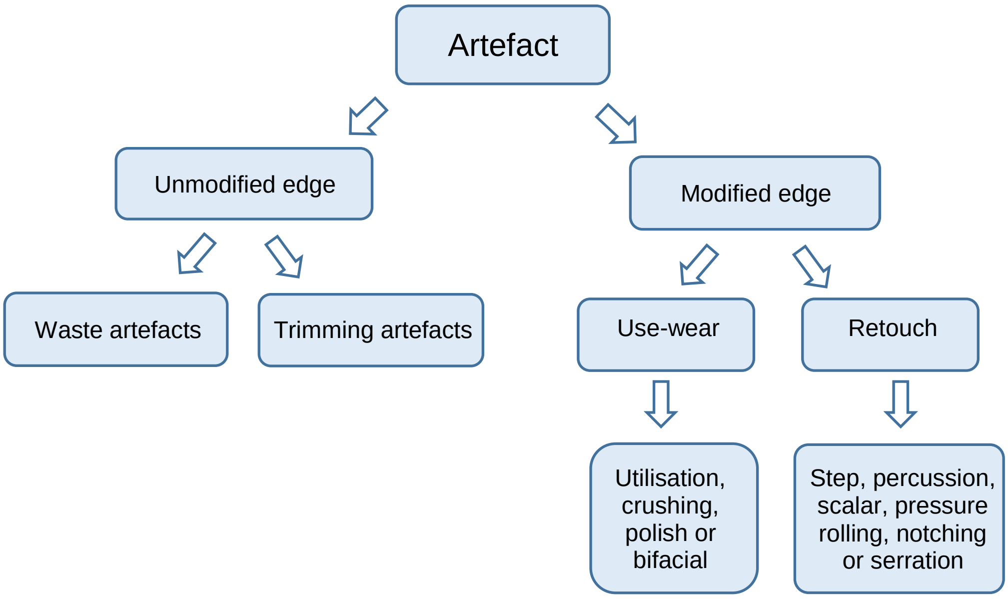


Figure 4-3 Marun's 'analytical approach' to stone artefact classification. Adapted from Marun (1972:161).

Marun's (1972) 'analytical approach' to lithic analysis could be considered reasonably progressive for his time. From the 1950s to 1980s, typological approaches were commonplace, with prevailing emphases on using stone tools as cultural markers, that is to infer that typological differences reflected separate 'stages' of cultural development (e.g. Bordes 1977; Mulvaney 1977; Tindale 1957, 1975; Wright 1977). Typological approaches often involved an emphasis on the overall morphology of artefacts (e.g. Debenath and Dibble 1994:94–109; Gould et al. 1971; Howchin 1934; McCarthy 1976; Tindale 1957), whereas Marun's (1972) 'analytical' approach concentrated on specific attributes.

In his focus on particular attributes, Marun (1972:158–159) identified six kinds of retouch (Figure 4.3; Table 4.1). Marun's (1972:158) use of the term 'spurs' is taken to refer to the 'teeth' or somewhat pointed projections created by retouching, although he did not describe how this term related to denticulation, serration or size.

Table 4-1 Types of retouch identified by Marun (1972) using his 'analytical approach.'

Retouch Type	Definition/Description	Reference
Percussion flaking	An 'organised pattern' of deep scar beds between spurs; this 'can extend several millimetres into the depth of an edge'	Marun 1972:158
Scalar flaking	A 'disorganised pattern' of shallow scars extending 'a few millimetres into the depth of an edge'	Marun 1972:159
Step flaking	No specific description provided but Marun considered abrupt stepped flake scars as evidence of use, sharpening and re-use	Marun 1972:158
Serration	Deliberately dentated spurs separated by deep, narrow scars	Marun 1972:159
Pressure rolling	Very shallow depressions on the edge of an artefact, created by pressure applied in a 'rolling' motion using a wooden stick or bone	Marun 1972:159
Notching	Normally one large flake scar on a concave edge	Marun 1972:159

4.1.4 Artefact Attributes Analysed by Marun

Marun (1972) analysed a broad range of artefact attributes and his categories are described in Table 4.2. He identified raw materials on the basis of colour, although he did not examine further diagnostic properties such as whether the structure was granular or fibrous (Marun 1972:172). Marun's (1972:178) methods for recording 'edge angle' were somewhat obscure but such measurements are complex and varied. 'Bifacial crushing' was minute step-flaking less than 1 mm deep, present at the intersections of two planes of an artefact and extending 'up to 1 mm from the edge into both intersecting planes' (Marun 1972:157).

Table 4-2 Artefact attributes analysed by Marun (1972).

Artefact Attribute	Marun's (1972) Description
Raw material	Flint: 'white and clear;' 'white and opaque;' 'honey and pink;' 'blue and grey'; limestone, chert, jasper, quartz, tektites
Artefact type	Determined on the basis of morphology and function as described above; included backed artefacts, scrapers, eloueras, tulas and points; Figure 4.2
Flake length	Maximum length in any direction
Flake width	Maximum width obtainable horizontally, perpendicular to length
Flake thickness	Maximum thickness obtainable perpendicular to length and width
Platform modification	Unmodified; dorsal margin crushed, step-flaked, retouched or 'utilised'; ventral margin retouched or 'utilised'; dorsal and ventral margin 'utilised'
Platform shape	'Plain'; flat surface with one, two or three facets; convex surface with one, two or three facets; damaged—original shape and modification is indeterminable
Platform thickness	Maximum thickness perpendicular to ventral margin of platform
Platform angle	The angle between the platform and the ventral surface of an artefact at the section through the point of percussion
Heat treatment	Present or absent
Bulb shape	Incipient, diffused or salient
No. of edges	Number of discernible edges on an artefact to a maximum of 5
Edge length	Length of the chord between the two ends of the edge
Whole/broken edge	Marun defined the edge as broken if use-wear/retouch had been 'forcefully discontinued,' creating an unexpected break in the edge
Edge shape	Straight, concave, convex or wavy
Edge angle	Angle of edge 'towards' its base; angle of long axis 'towards' the edge
Edge orientation	Dorsal or ventral; left or right; proximal or distal
Cortex	Present or absent
Retouched margins	Number of retouched margins
Retouch type	Percussion, stepped, scalar, serration, pressure rolled, notched; Table 4.1
Use-wear type	Utilisation, crushing, bifacial crushing, polishing

4.1.5 Marun's Chronology

Marun (1972:554) obtained five radiocarbon dates from charcoal (Table 4.3). These dates were calibrated in the present study using *OxCal* version 4.2 (Table 4.3; Figure 4.4). Marun's (1972) most recent date, from a depth b.s. of 0.6 m, was 2717 ± 283 cal. BP (Table 4.3). His oldest date of 24,589 ± 2254 cal. BP was taken from a depth b.s. of 4 m, but the lowest artefact he excavated was from 0.8 m further below at 4.8 m b.s (Table 4.3). Marun, drawing of course on these dates, calculated the following sediment deposition ratios for Allen's Cave to arrive at an antiquity for this artefact of approximately 25,000 BP (Marun 1972:246):

0 BP–2650 BP: 1 cm per 44 years

2650–4100 BP: 1 cm per 21 years

4100–8300 BP: 1 cm per 83 years

8300–12,000 BP: 1 cm per 61 years

12,000–20,000 BP: 1 cm per 51 years

20,000–c. 24,000 BP: 1 cm per 32 years

Table 4-3 Radiocarbon dates on charcoal, obtained by Marun (1972:553–554) and calibrated.

Depth (m)	Spit	Date Obtained by Marun (BP)	Date (BP), Calibrated
0.6	6–7	2650 ± 100	2717 ± 283
1.3	12–13	4140 ± 160	4712 ± 554
1.8	17–18	8780 ± 140	10,190 ± 650
2.4	23–24	11,950 ± 250	14,022 ± 742
4.0	39–40	20,200 ± 1000	24,589 ± 2254

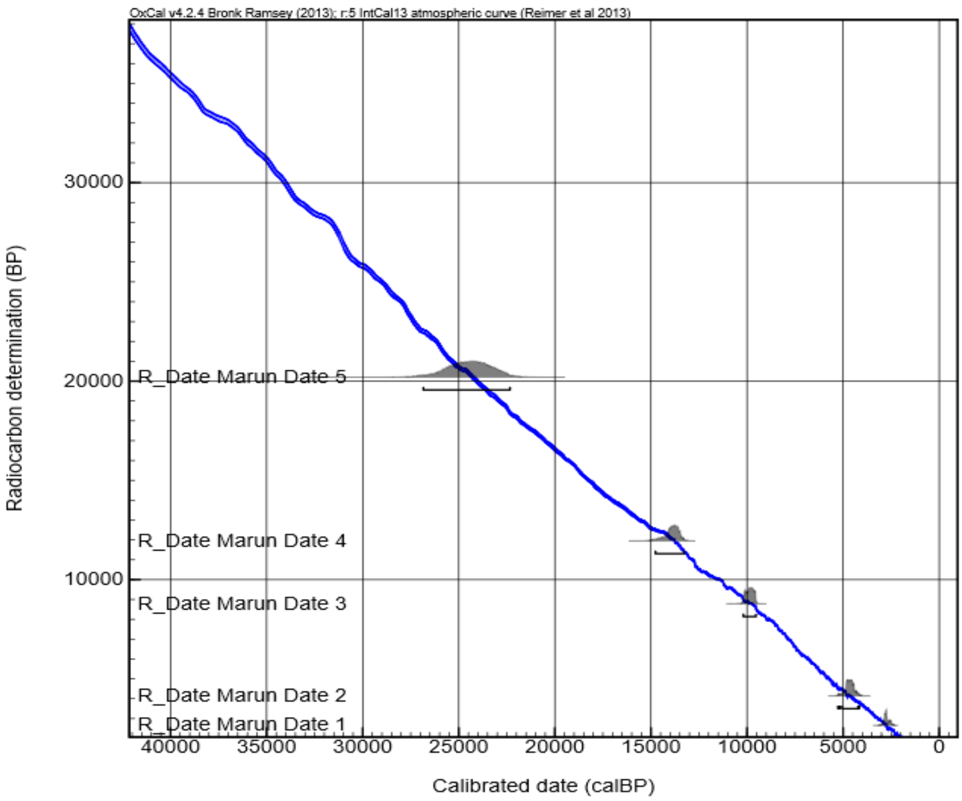


Figure 4-4 The calibration of Marun's (1972:554) radiocarbon dates; 95.4% confidence.

Marun (1972) was not explicit in his descriptions of the relationship between the natural stratigraphy, his arbitrary spits and the radiocarbon samples, which presents difficulty for further examination of his dates (see also Cane 1995:7; Smith 2013:175). He did not specify the trench(es) from which the radiocarbon charcoal dates were obtained, nor whether the charcoal was from hearths (he did not mention excavating any hearths), leaving open the possibility that contextual factors such as contamination or taphonomic processes affected the dating. Further, Marun (1972:246) did not explain the basis of his sediment deposition ratios. This does not automatically make the ratios incorrect but it prevents a consideration of their accuracy. Sediment deposition is affected by both natural and anthropogenic factors, yet Marun (1972) gave no descriptions of any accounting he might have made for the relative influence of each.

4.1.6 Marun's Results and Conclusions

Based on his chronology and analysis Marun (1972) produced many results (Table 4.4) and made several conclusions. Only 685 of Marun's (1972:553) 2563 lithics derive from the time period of focus in the present study (Chapter 1 [1.9]). Marun (1972) estimated that Allen's Cave was initially occupied by humans around 25,000 BP, with a likely gap from 17,500–15,000 BP (using the original rather than the calibrated dates). The possible occupation gap was based on the presence of 'only a handful' of artefacts from the spits representing depths b.s. of 3.5 m–3 m (Marun 1972:328). Marun (1972) concluded that the stone artefacts became smaller over time and as this occurred the frequency of retouch increased, but that overall the lithics exhibited minimal change.

Despite identifying different raw materials, Marun (1972) did not make any related behavioural inferences. He does not appear to have identified any non-local raw material (Benbow 1990:20–21; Burnett et al. 2013:246–248; Dr Alan Watchman 2015, pers. comm.; Drexel and Preiss 1995:184; Frank 1971:31; O'Connell et al. 2012:1–3; SARIG 2015a, SARIG 2015b Table 4.4) and he did not describe the quartz or jasper. Quartz exists in varied forms and may have been a microcrystalline version such as chalcedony (Rapp 2009:76). Similarly, jasper is a variety of chert (Rapp 2009:76). Comparisons of Marun's (1972) raw material identifications are also limited by his lack of description of the layers from which he excavated quartz and jasper. Further, Marun (1972) did not specify the raw material for each individual or 'type' of stone artefact. Based on his descriptions of trimming artefacts such lithics may derive from tulas, but Marun (1972:155) did not offer an inference in this regard. The oldest tula was, however, c. 4200 BP, whereas trimming artefacts were excavated through to Marun's (1972) 'phase IV,' which represented 12,000–25,000 BP.

Marun (1972:250) argued that the oldest backed artefact and two Bondi points (often grouped as backed artefacts) at the site dated to c. 15,000 BP. All backed artefacts and Bondi points observed by Marun (1972) are most likely in the unprovenanced part of his assemblage (Dr Keryn Walshe 2015, pers. comm.). Nevertheless, such antiquity would add to other excavated Pleistocene backed artefacts, such as in north-western Queensland, also at c. 15,000 BP (Slack et al. 2004:134–136), in discounting previous notions that this stone technology was first used in Australia in the mid-Holocene (e.g. Bowdler and O'Connor 1991; Flood 2010:229; Johnson 1979:115–118).

Marun's (1972:248–251) chronology for the oldest backed artefact and two Bondi points is, however, inconsistent. Marun (1972:251) retrieved 'most' of the 11 backed artefacts *in situ* rather than from sieves but he did not provide details of the trenches from which these lithics were recovered and gave an inexact description of their depths as 0.2 m–0.3 m b.s. Marun (1972:251) described eight backed artefacts as derived from his category 'phase 1,' which equates to 0–4000 BP, while three, including the oldest, along with the two Bondi points, were from 'phase 3.' Phase 3, however, represents 8000–12000 BP. Notwithstanding, a date of 12,000 BP would still be among the older dates hitherto ascribed to backed artefacts. Consideration of Marun's (1972) overall chronology for Allen's Cave must occur with comparison to the evidence for dates obtained for Cane's (1995) excavation (section 4.3). Dates in Table 4.4 use Marun's (1972) (uncalibrated) chronology because this table is intended to reflect results according to his interpretation.

Table 4-4 Summary of Marun's (1972) results.

Assemblage Aspect	Marun's Results
Assemblage Composition (general)	• Artefact total: 2563 • 40.4% of artefacts = 'waste' • 40.2% of artefacts = 'trimming artefacts' • 19.4% artefacts had modified edges
Assemblage Composition (artefact types)	• 11 backed blades (oldest c. 15,000 BP) • 9 Bondi points (oldest 15,000–14,000 BP) • 28 tulas, 6 of which were slugs (oldest tula = 4200 BP; most 2000–1500 BP) • Scrapers = 25.4% of entire assemblage (or 4.5% of retouched, 'functionally unrestricted' lithics), with most 12,000–8000 BP • 6 tektites • 1 elouera, which was from 4000–0 BP
Raw Materials	• 81.6% of artefacts with modified edges were made from flint while chert, jasper and quartz were 'represented in insignificant proportions'
Artefact Sizes	• Considerably smaller in the Holocene (not quantified by Marun) • Of artefacts with modified edges, 'larger' ones tended to have 2 or 3 modified edges, while 'smaller' ones had 1 (not quantified by Marun)
Antiquity	c. 25,000 BP
Artefact Density	• Only 6.5% of entire assemblage = from 25,000–12,000 BP • Only 'a handful' of artefacts occur from around 17,500–15,000 BP • Overall increase from c. 12,000 BP, with a particular increase from 6000–4000 BP, peaking 5000 BP

4.2 Raw Materials Local to the Allen's Cave Region

Geological maps and a range of literature attests to Miocene Nullarbor Limestone being local to the Allen's Cave region (Benbow 1990:20–21; Burnett et al. 2013:246–248; Drexel and Preiss 1995:184; Frank 1971:31; O'Connell et al. 2012:1–3; SARIG 2015a, SARIG 2015b). Wilson Bluff Limestone is also within 10 km but located at the bottom of cliffs over 45 m high (Parkin et al. 1969:195–196). Limestone, a calcium carbonate (Ahnert 1996:250), cannot be knapped because it is neither isotropic nor siliceous and is too soft (Rapp 2009:55), but due to a range of depositional and metamorphic processes, chert can be derived from limestone, occurring as nodules along bedding planes (Dr Alan Watchman 2015, pers. comm.; Luedtke 1992; Rapp 2009:55, 78). Chalcedony forms from varieties of chert (Dr Alan Watchman 2015, pers. comm.; Cetin et al. 2013:76, 79; Rapp 2009:80) and calcrete, a secondary precipitate of calcium carbonate (Ahnert 1996:84), can form from groundwater as a result of particular chemical interchanges involved in the fluctuations between marine and terrestrial processes as sea levels changed (see also Ahnert 1996:84–85; Webb et al. 2013:131)—such as occurred at Allen's Cave (Chapter 3).

The depositional and metamorphic processes occurring over time in the Allen's Cave region resulted in the formation of chert, chalcedony and calcrete (Dr Alan Watchman 2015, pers. comm.). Chert, rather than flint, is identified in the present study as the primary raw material for the Allen's Cave lithics. Silicified sandstone, also identified, is not known in the local region (Dr Alan Watchman 2015, pers. comm.; SARIG 2016) (raw material properties are discussed in Chapter 5). The nearest source of silcrete, as identified by Cane (1995:27), is over 200 km north, in central Australia (Stephens 1964, 1966). Cane (1995) was not able to do a sourcing study of silcrete but current South Australian governmental geological records indicate that silcrete does not occur on the Nullarbor (SARIG 2016). Silcrete possesses similar properties to silicified sandstone (Chapter 5).

Tektites were identified in the Allen's Cave assemblage by Marun (1972:327) and Cane (1995:25). Also known as 'australites,' tektites are natural glasses (Rapp 2009:53, 197) that appear similar to obsidian. They are highly siliceous and typically 10 mm–20 mm (Rowland 2014:1). Ethnographic evidence suggests that Aboriginal people, prior to European arrival, considered tektites to have magical properties and used them in traditional healing practices, as message stones and in the production of a range of formal tool types (Akerman 1975:117–118; Baker 1957:1, 17; McNamara and Bevan 2001:27–28; Rowland 2014:4). Tektites have been the subject of widespread collection for their aesthetic properties, resulting in their provenance often being unknown, but they have been found across large tracts of southern Australia, dating to the late Pleistocene and Holocene (Rowland 2014:2–15).

Comparing the Allen's Cave lithic raw materials can facilitate several behavioural inferences. Preferences for using certain materials to produce different kinds of artefacts may be determined (Andrefsky 2009:75–80; Andrefsky 2010; McBryde 1987; McCarthy 1977; Tibbett 2002, 2006). Such priorities may indicate, for example, a reliance on local raw materials even if the materials were regarded as lesser quality, because of the advantage in minimising risk during harsh environmental conditions by reducing foraging range (e.g. Boydston 1989; Hiscock 2008:61; Jeske 1989; Lamb 1996; Peterson and Lampert 1985; Smith et al. 1998; Torrence 1989a and b).

Comparing raw materials from an assemblage to their nearest possible sources is a mechanism for indicating or inferring the occurrence of trade or exchange systems and/or the distances travelled by people (Clarkson 2008; McBryde 1987; McCarthy 1977; Roth 1897; Tibbett 2002; Veth et al. 2011a). Raw material comparisons cannot always be done to a fine resolution (e.g. to the exact kilometre), as is the case in this research because of the inability to explore local raw material availability through a site visit (Chapter 1 [1.9]). The presence, however, of any non-local raw material in the lithic assemblages, may form a basis for behavioural inferences.

4.3 The Second Excavation and Analysis: Scott Cane, Rhys Jones and Anne Nicholson, 1995

Over two seasons across 1989 and 1990, Scott Cane, Rhys Jones and Anne Nicholson excavated three new trenches at Allen's Cave. Their observation of 'a number of hearths and artefacts protruding from the eroded western face' of Marun's trenches 'E2' and 'E3' (Cane 1995:10) prompted them to add a new 1 m x 1 m trench adjacent to each, naming them 'D2' and 'D3' respectively. They situated the third 1 m x 1 m trench adjacent to the southern margin of 'E3,' designated 'E4.' The plan of all Allen's Cave trenches, Figure 4.5, is contextualised within the floor of the rockshelter in Figure 4.1.

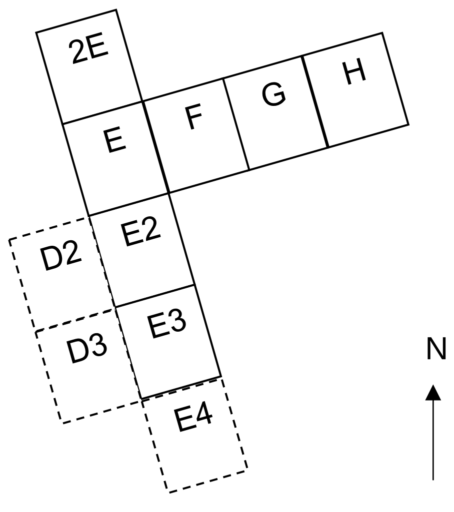


Figure 4-5 Plan of Allen's Cave trenches: complete line = Marun (1972); dashed line = Cane (1995).

Cane (1995:11) described his excavation as generally following the site stratigraphy and where this was impossible using 0.1 m spits. He did not, however, specify details of when he used each method, although he did outline the numbers of spits and the depths b.s. of each trench at which the lowest artefactual material was found (Table 4.5).

Table 4-5 Cane's (1995) spits and depths of the lowest cultural material per trench.

Trench	Spits	Depth Beneath Surface (m)
D3	25	2.56
E4	41	3.27
D2	29	4.03

Like Marun (1972), Cane (1995:13–19) observed two distinct stratigraphic units (Figure 4.6, item number 4). The ‘orange’ section, comprising orange clay/silt, was ‘roughly synonymous with the Pleistocene,’ while the ‘black’ deposit, of brown, loamy sand from the surface to 1.6 m b.s., corresponded broadly with the Holocene (Cane 1995:12). Laboratory XRD analysis on the distinct sediments, undertaken for Cane’s (1995) report, demonstrated negligible difference in the mineral composition between these sections and that the ‘black’ was caused by a slight increase in carbon. The added carbon masked the iron oxides (aeolian-derived; Olley et al. 1997:442) that were responsible for the ‘orange’ (Cane 1995:18). It appears likely that the increase in carbon was due to the six relatively large Holocene hearths (Figure 4.6) and to the contemporaneous growth in coastal woodland (Martin 1973:294, 300–301).

Legend (adapted from Cane 1995)

1. Top hearth 300 ± 50 BP
2. Hearth 2800 ± 70 BP (ANU 6843) (radiocarbon)
3. Hearth 5460 ± 70 BP (ANU 6844) (radiocarbon)
4. Interface of 'black' and 'orange'
5. 'Memorial hearth' 9530 ± 190 BP (ANU 6849) (radiocarbon and OSL)
6. North-west lens
7. Abalone shell
8. Hearths (E4) 22,200 ± 2000 BP (OSL)
9. 'Cromlech'
10. Lowest hearth 39,800 ± 3100 BP (OSL)
11. Lowest artefacts

= rock = hearth = burrow = gravel

Figure 4-6 Cane's (1995) section drawing of the south and west walls at Allen's Cave.

4.3.1 Cane's Artefacts and Dates

Cane (1995:12, 13, 22, 28) excavated 1256 flakes and 24 cores. He recovered two shell artefacts, a cockle (*Katelysia scalarina*) and an abalone (*Haliotis laevigita*), dated by stratigraphic association with radiocarbon and OSL dates to c. 10,000–11,000 BP and 16,000 BP respectively (Cane 1995:13, 34–38). The lowest excavated artefacts were an unmodified 'flint' flake and three 'limestone' flakes (Figure 4.6, item 11). At the bottom of a large chute in D2 spit 29, these artefacts were wedged between large rocks, thereby unable to move sideways, and directly above them was a layer of gravel that rendered any prior downward movement impossible (Cane 1995:12, 13).

The integrity of Cane's (1995) dates was compellingly demonstrated by several other factors. First, an OSL date obtained from 0.1 m b.s. in trench E4 provided a near-modern date of 300 ± 50 BP (Roberts et al. 1996:13). Second, the OSL date of 10,100 ± 600 BP for a hearth, mainly in D3 but also extending partly into both D2 and E4, at 1.5 m b.s., was independently verified by the three calibrated radiocarbon dates for charcoal pieces from this hearth, of c. 10,500 BP, c. 10,200 BP and c. 10,000 BP (Roberts et al. 1996:14). Third, a thermoluminescence ('TL') date from this depth also corresponded with the radiocarbon and OSL dates, at 11,100 ± 900 BP (Roberts et al. 1996:13), and the TL and OSL 'paleodoses' were in agreement (Roberts et al. 1996:14). A paleodose is the amount of radiation acquired from cosmic rays by a sample before being buried and it must be calculated before an accurate age can be obtained (Olley et al. 1997:433–434).

A fourth factor supporting the luminescence dates for Cane's (1995) excavation is the minimal error margins in the 'dose rate' calculations. The dose rate is the amount of radiation received by a sample while buried and this is also needed to calculate age (age=paleodose ÷ dose rate [Olley et al. 1997:433; Roberts et al. 2015:42]). Olley et al. (1997) analysed the dose rate on five mineralogy samples spanning both stratigraphic sections (the 'black' [Holocene] and the 'orange' [Pleistocene]) at Allen's Cave. They calculated that if the present-day dose rate is presumed to have been the same as the rate operating throughout the human occupation of the rockshelter, an error margin of up to only 2% exists between the dose rate calculated during the luminescence dating (Roberts et al. 1996) and the contemporary dose rate (Olley et al. 1997:440). Even if the present-day dose rate is not presumed and instead the parent nuclide concentrations are used to calculate the dose rate, the maximum error margin would be only 6% (Olley et al. 1997:440).

Olley et al.'s (1997) analysis may imply that the dates for Cane's (1995) excavation have a slightly greater range than exists without their results, but they constitute further evidence for the integrity of Cane's (1995) dates compared to Marun's (1972). The slight increase in the potential dating range is effectively immaterial to the aims of this research, which are concerned with broad time periods and not dependent upon fine chronological resolution.

While no inconsistencies are apparent in the ordering of Marun's (1972) dates, the sizeable discrepancy between his and Cane's (1995) oldest samples, c. 25,000 BP and 39,800 ± 3100 BP respectively, means that both cannot be accurate. The dates for the lowest artefacts were based on the same depth of 4 m and stratigraphic continuity is apparent between Marun's (1972) and Cane's (1995) trenches (Figure 4.6) On the basis of the above, thorough evidence for the integrity of the dates obtained for Cane's (1995) excavation and the absence of considerable contextual information from Marun (1972) (which, again, does not automatically make his dates erroneous), Cane's (1995) dates are preferred. Because a date for the lowest artefacts was obtained from sediments in direct association (Roberts et al. 1996:13, 15), Cane (1995) did not need to rely on sediment deposition ratios to calculate their antiquity. He did, however, calculate an average rate of 1 cm per 130 years, contrasting Marun's (1972) of 1 cm per 57 years (Cane 1995:39).

Cane's (1995:39) inferred sediment deposition ratio is more likely than Marun's (1972:246) for several reasons. Cane based his ratio primarily on the considerable depth of Allen's Cave making it more likely to lead to low rates of sediment accumulation and on the Nullarbor Plain 'being decidedly short of soils and sand' (Cane 1995:39), with the nearest supply around 40 km west (Cane 1995:39; Gillieson and Spate 1992:73). His sediment deposition rates also reflected a gradual increase over the human occupation of the rockshelter (Cane 1995:39). Marun's (1972:22–30, 173–174, 242–247) calculations, however, resulted in an average of 1 cm of sediment deposited per 57.5 years during the Pleistocene and 1 cm per 55 years in the Holocene (also in Cane 1995:39). This is contrary to expectations given that, despite imprecision involved in population estimations (Attenbrow 2004:29; Clarkson 2007:130–

134; Lourandos 1983:82, 92; Lourandos 1985:391, 400, 411; Ross 1984:200), it is likely that human and faunal occupation and therefore sediment accumulation was more intense during the Holocene (Walshe 1994:257).

The intensity of Holocene sediment accumulation, that supports Cane's (1995:39) ratio for faster deposition, is confirmed by erosional agents. Effective precipitation was at its highest in the region during the early Holocene (Fitzsimmons et al. 2013:88, 92; Gliganic et al. 2014:114; Martin 1973:300–302), and hearths, which involve another erosional agent, fire, were more substantial at Allen's Cave during the Holocene (Cane 1995:13, 39; Figure 4.6). Sea spray contributed to erosion in the Nullarbor region (James et al. 2012:572) but Allen's Cave was only near the coast from the beginning of the Holocene. Faunal remains increased in the Holocene (Walshe 1994:257–260) and Cane (1995:23–24) and Marun (1972:553) reported relatively high lithic quantities for the Holocene up to c. 1000 BP.

4.3.2 Reconciling the Dating Discrepancies between Marun and Cane

Table 4.6 shows the dates for the two excavations at depths b.s. Broad similarity exists at 1.5 m–1.6 m b.s. for Cane (1995:38; Roberts et al. 1996:13) and 1.8 m b.s. for Marun (1972:554), with both dates in the early Holocene, which is 11,000–8000 BP. At 2.4 m b.s., Marun's (1972:554) radiocarbon date was 14,022 ± 742 BP, while at 2.8 m b.s., Cane's (1995:24, 38) OSL date was 22,200 ± 2000 BP. While Marun's (1972:554) date at 4.0 m b.s. was 24,589 ± 2254 BP, Cane's date at 4.03 m b.s. was 39,800 ± 3100 BP (Cane 1995:13, 38; Roberts et al. 1996:15).

Table 4-6 Dates obtained for Allen's Cave by Marun (1972) and Cane (1995; Roberts et al. 1996:13, 15).

Depth Beneath Surface (m)	Date (BP): Marun (1972); all by C14, calibrated	Date (BP): Cane (1995); Roberts et al. (1996)
0.1		300 ± 50; OSL
0.6	2717 ± 283	
0.7		2800; C14
1.0		5460 ± 70; C14
1.3	4712 ± 54	
1.5–1.6		Sample 1: 10,000; C14 (cal.) Sample 2: 10,200; C14 (cal.) Sample 3: 10,500; C14 (cal.) Sample 4: 10,100 ± 600; OSL
1.8	10190 ± 650	
2.4	14,022 ± 742	
2.8		22,200 ± 2000; OSL
4.0	24,589 ± 2254	
4.03		39,800 ± 3100; OSL

Marun's (1972) dates can be broadly correlated with Cane's (1995). The large time periods focused on in this thesis mean that exact chronological agreement is not imperative, and in any case exactness is not possible due to all archaeological dates involving calibration or margins of error (Hiscock 2008:29–30). Some estimation of dates at depths b.s. occurring between dated samples must also always occur for any archaeological excavation given that it is not feasible to obtain a date for every centimetre, and Cane's (1995) and Marun's (1972) trenches being adjacent adds to the likelihood, in the absence of clear descriptions from Marun (1972), of reasonable stratigraphic similarity. There is considerable evidence for stratigraphic continuity in Cane's (1995) section drawing (Figure 4.6), which depicts two of Marun's (1972) trenches ('E' and '2E'). The dating correlations result in Marun's (1972:554) date of 24,589 ± 2254 BP being adjusted to c. 39,800 ± 3100 BP for the purpose of this analysis.

Depths beneath the surface that represent the beginning and end of the early Holocene (11,000–8000 BP) and LGM (30,000–19,000 BP) can therefore be estimated for both assemblages. A limitation exists, albeit applying to all such estimations, in that equivalent sections of depths occurring over different depths b.s. do not necessarily represent the same passing of time (Frankel 1988; 1991:56–62). A 0.2 m deep spit at one depth, for example, could represent 'x' years whereas another at a different depth could represent 'y' years. Differences may arise because of a range of factors such as surrounding environmental conditions, sediment deposition rates, trampling or other post-depositional disturbance and taphonomic processes (Frankel 1988; 1991:56–62). Considerable evidence, however, is used in the estimations, based on calculations of time passed over depths between Cane's (1995:38; Roberts et al. 1996:13–15) obtained dates and the close correspondence of these using Cane's (1995:13) age-depth curve (Figure 4.7).

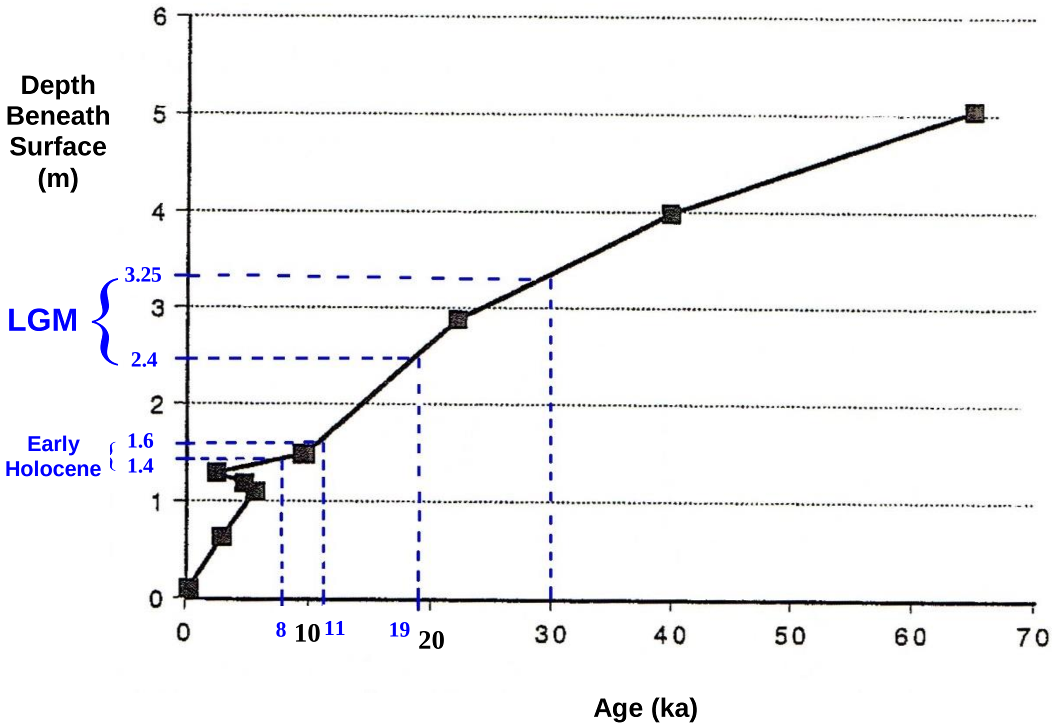


Figure 4-7 Age-depth curve for Allen's Cave. Adapted from Cane (1995:13).

For the early Holocene, Cane's (1995:38; Roberts et al. 1996:13) dates were around 10,000 BP at 1.5 m–1.6 m b.s (Table 4.6). At 1.0 m b.s. his date was approximately 5460 ± 180 BP, which, when rounded for ease of comparison to 5500 BP, represents the passing of 5000 years over 0.5 m. Using this ratio, the estimated depth b.s. for the start of the early Holocene, 11,000 BP, would be 1.6 m, and the end of the early Holocene, 8000 BP, would be 1.25 m. Such depths correspond closely with measurements taken from Figure 4.7. The measurements used millimetres between the relevant ages and depths (reflected by the dotted lines) along the x and y axes, which have these dates at 1.6 m and 1.4 m respectively. These estimated depths b.s. for the early Holocene are also consistent with Cane's (1995:12) observation of the depth b.s. of the change in sediment representing the beginning of the Holocene. Depths b.s. used are therefore 1.6 m for 11,000 BP and 1.3 m for 8000 BP.

Spits representing the depths beneath the surface at Allen's Cave can be calculated. Given that Marun's (1972) spits were each of 0.1 m, the early Holocene period is represented by his spit numbers 13–16 (Table 4.7). Identifying Cane's (1995) corresponding spits is complicated because he did not specifically describe the differing depths of his spits across the three trenches. He did, however, describe the start of the early Holocene, at approximately the same time of 11,000 BP as used in this thesis, as occurring in D2 spit 12, D3 spit 13 and E4 spit 20 (Cane 1995:18–20). The end of the early Holocene, at 8000 BP, is therefore considered to be represented by D2 spit 9, D3 spit 10 and E4 spit 16 (inclusive), based on Cane's (1995:20, 38) discussion of a negligible 'transition zone' between the Pleistocene and Holocene and with reference to his date of around 5500 BP at 1 m b.s. The mid-Holocene is represented at 1 m b.s., with associated spits in Table 4.7.

For the LGM, Cane (1995:24, 38) obtained an OSL date for a hearth at 2.8 m b.s. of 22,000 ± 2000 BP. His estimation for the abalone shell (*Haliotis laevigita*) of approximately 16,000 BP (Cane 1995:38) is consistent with his age-depth curve (Figure 4.7) and equates to a difference (in relation to the hearth) of around 6000 years over 0.5 m. Such a ratio is similar to that for the early Holocene and leads to an estimate of the end of the LGM, 19,000 BP, being represented at 2.55 m b.s. This depth corresponds closely with Figure 4.7, which has the depth at 2.4 m. Cane's (1995:13, 38) next date below the 2.8 m deep hearth was not until 4.03 m b.s. and at approximately 40,000 BP, this represents a passing of around 12,000 years over 1.2 m. Estimation for the depth representing the start of the LGM, 30,000 BP, must therefore occur over a far greater range.

The ratio of 12,000 years over 1.2 m is, however, consistent with the ratios for the early Holocene and the end of the LGM, all approximately at 0.1 m representing 1000 years (the overall antiquity of approximately 40,000 years occurs over 4 m, which is also the same ratio, although this is an extremely vast time scale). Applying this ratio between the dates at 2.8 m b.s. and 4.03 m b.s., the start of the LGM is represented at 3.4 m b.s. This depth also corresponds closely with calculations from Figure 4.7, which put the depth at 3.25 m. It is thus considered that the depth b.s. of 2.4 m represents 19,000 BP and 3.3 m b.s. represents 30,000 BP, equating to Marun's (1972) spits 24–33 (Table 4.6).

The fossilised abalone (*Haliotis laevigita*) artefact of c. 16,000 BP was recovered from Cane's (1995) trench D2 spit 22, while the lowest lithics at 39,800 ± 3100 BP were from D2 spit 29. Cane (1995) did not describe the depths of each spit for this period, but these eight spits span around 14,000 years. On this basis the LGM can be extrapolated to be represented by D2 spits 24–27. D3's depth b.s. of 2.56 m precludes it from the LGM, while Cane (1995:16) did refer to E4 spit 35 as being 2.43 m b.s. and the total depth b.s. of E4 of 3.27 m takes it to 30,000 BP. Therefore spits 35–41 represent the LGM from this trench.

Table 4-7 Time periods and associated spits.

Time Period	Time (c. BP)	Marun's (1972) Spits	Cane's (1995) Spits Per Trench
Post Early Holocene to Mid-Holocene	5500–8000	10–12	D2: 5–8 D3: 6–9 E4: 11–15
Early Holocene	**8000–11,000**	**13–16**	**D2: 9–12** **D3: 10–13** **E4: 16–20**
Between the Early Holocene and LGM	11,000–19,000	17–23	D2: 13–23 D3: 14–25 E4: 21–34
LGM	**19,000–30,000**	**24–33**	**D2: 24–27** **D3: n/a** **E4: 35–41**
LGM to Initial Colonisation	30,000–40,000	34–48	D2: 28–29 D3: n/a E4: n/a

Using dates based on environmental data described in Chapter 3, combined with these calculations, helps to minimise difficulties relating to the choice of analytical units. As Frankel (1991:57–73) demonstrated, using different analytical units can produce considerably varied interpretations. Should, for example, artefacts from a given assemblage be analysed in units of single millennia, certain patterns may appear that may contrast with those resulting from analysis over units of five or ten millennium. The time periods used for Allen's Cave are, however, determined by environmental data reflecting the timing of the LGM, early Holocene and surrounding periods, all involving several millennium.

As with most archaeological excavations, only a part of Allen's Cave could be excavated. There is therefore always the possibility that lithics and other archaeological material could exist in different quantities at various depths at other areas within the site (Frankel 1991:57). Apparent gaps in human occupation based on an absence of cultural material presume that existing artefact deposition patterns continue throughout the rockshelter. Given that such complications could, however, potentially exist for any archaeological site, conclusions are best viewed as being based on contemporary knowledge and interpretations, with all results always being subject to possible future research. Marun (1972) and Cane (1995) did, however, situate the trenches in one of the most likely occupation areas, near the drip-line, and excavations covered ten square metres of the surface area of the floor. It is problematic to calculate the total surface area of the living area of the floor because Marun (1972) did not provide its dimensions while Cane (1995:4) described it as '18 m x 10 m' but also as 'triangular,' which implies that a third measurement is required.

4.3.3 Cane's Artefact Analysis and Results

To achieve his generalised aims of obtaining a broad sense of the density of site occupation and to explore the information potential of raw material analysis, Cane (1995:22) did not need to analyse an extensive array of lithic attributes. Cane (1995) did not explicitly list the attributes that he chose to investigate, but he recorded several categories of information:

(i) the total number of artefacts;

(ii) raw materials at depths b.s.;

(iii) flake surface area (calculation methods unspecified [Cane 1995:31]);

(iv) 'typological artefact types' at depths b.s. (although not contemporarily generally accepted as 'typological types,' Cane [1995:29] grouped 'unretouched flakes,' 'retouched flakes,' 'cores' [not further sub-categorised] and 'flaked pieces' as 'types'; he did also identify a currently accepted 'type,' 'backed artefacts');

(v) artefact density (number of artefacts per cubic metre; Table 4.8);

(vi) artefact weight for each raw material per spit;

(vii) artefact sizes at depths b.s. (measurement techniques unspecified [Cane 1995:31]); and

(viii) the extent of retouch on margins of flakes.

It can thus be presumed that Cane (1995) analysed the stone artefact attributes of length, width, depth, raw material, 'typological type,' weight and a form of measurement for the extent of retouch.

Cane's (1995) results are summarised in Table 4.8. Without providing specific quantitative details Cane (1995:26) identified that 'flint' (along with 'limestone') was used during the Pleistocene but in low proportions in comparison to the Holocene. All 24 retouched artefacts were made from 'flint,' with 20%–30% of 'the margin' retouched on 'most,' while 'some' exhibited retouch on up to 90% of 'the margin' (Cane 1995:28). Steep retouch existed on six lithics, while one artefact 'resembled' a nosed scraper (Cane 1995:28). Cane (1995), like Marun (1972), did not define 'the margin' on lithics, nor did he describe his criteria for raw material identification. Details were not provided concerning the nature of the broken flakes, so links cannot be made with Marun's (1972:155–156) 'trimming' or 'waste' products. Cane (1995:28) identified two backed artefacts, at 1.05 m b.s., dating them by stratigraphic association to c. 4000 BP, but none approaching Marun's (1972:251) claimed antiquity of c. 15,000 BP.

Table 4-8 Summary of Cane's (1995) results.

Aspect	Cane 1995
Assemblage Composition (general)	• Artefact total: 1280 • 1256 flakes, 24 cores
Assemblage Composition (artefact types)	• 2 backed blades, 2 tektite flakes • 90% = 'unmodified flakes' • 6% = 'flaked pieces,' defined as 'broken flakes' • 24 cores • 24 retouched flakes
Raw Materials	• 78% = flint ; 21% = varieties of limestone; 1% = 'exotics': 17 silcrete, 2 tektites • 'Limestone' flakes larger and generally older than flint flakes • At around 10,000 BP flint largely replaced 'limestone': 77% = flint • By 4000 BP 97% = flint • All retouched flakes made from flint • 78% of the cores = 'limestone'
Artefact Sizes	• 50% = <1 square cm • 36% = 1 square cm–4 square cm • 14% = >4 square cm
Antiquity	39,800 ± 3100 BP
Artefact Density	• 363 stone artefacts per cubic metre • 'High' at initial occupation • Decline approaching last interglacial • 'Very few' from 22,000–15,000 BP • Increase at end of LGM (according to LGM dates used by Cane) • Peak at 10,000 BP • Averaged a decrease over the Holocene (specific densities per his specified time periods not quantified by Cane)

4.3.4 Cane's Conclusions

Cane (1995) made wider-ranging conclusions than Marun (1972). His predominant interpretation was that there was no 'evidence for notable technological change over the 40,000 years of prehistory at Allen's Cave' (Cane 1995:43). He also concluded (Cane 1995):

1. That there was possibly an occupation gap at approximately 27,000–26,000 BP;
2. That occupation gaps reflected typical desert foraging strategies rather than large-scale abandonment. Cane (1995:23–25) based this conclusion on occupation gaps being only brief, and on patterns of artefact densities and similarities with contemporary Western Desert people's foraging strategies;
3. That the preference for 'flint' over 'limestone' increased significantly when it became more available around 10,000 BP after rising sea levels had eroded the cliff face and exposed 'flint', because 'flint' has better flaking properties;
4. That lithics became smaller over time, particularly during the Holocene, because:
   (i) 'Flint' was highly valued but relatively scarce until the early Holocene so people needed to use it expeditiously and in so doing they became increasingly skilled at manufacturing smaller artefacts, with the better flaking qualities of flint being conducive to this;
   (ii) Improved skills in manufacturing smaller artefacts were also then applied to 'limestone'; and
   (iii) More people used lithics for longer (a future use-wear/residue analysis could inform us further about this);
5. The absence of 'flint' cores is due to their being taken away from Allen's Cave;
6. More people occupied Allen's Cave during favourable environmental periods, particularly around the start of the Holocene; and
7. The 'silcrete' flakes reflect the first 'definite proof' for trade or exchange on the Nullarbor.

4.4 Chapter Summary

In combination, Marun (1972) and Cane (1995) analysed a wide variety of aspects of the lithic technology from Allen's Cave, providing insights into the lives of Aboriginal people from the region. Marun (1972) examined a comprehensive array of stone artefact attributes with methods somewhat advanced for his time. His conclusions, however, related primarily to the lithics themselves, without related inferences about human behaviour. Cane (1995) reached a range of informative behavioural conclusions but his specific aims required a limited range of lithic attribute analysis. Reanalysis affords the first opportunity for examination of lithics from both excavated assemblages. New interpretations are possible based on the refined timing for the LGM. The analysis of early Holocene lithics from both excavations can extend our understandings by comparing past human behaviour during a period of contrasting climatic circumstances.

Chapter 5: Methods

In this chapter the methods used are described, from engaging with the traditional owners to the stone artefact attributes selected for analysis and the ways in which they were identified and recorded. The behavioural information that can be inferred from the analysis of each artefact attribute is explained (Table 5.1) and the sample size and methods of statistical analysis are outlined.

5.1 Community Engagement

Initial community contact was made prior to the beginning of the project via telephone to FWCAC Corporate Services Manager Ms Kerrie Harrison, with whom collaborative discussions were held concerning the aims, possibilities, methods, scope and potential outcomes (c.f. Colwell-Chanthaphonh and Ferguson 2008). FWCAC Chairperson Mr Basil Coleman and fellow board members were then emailed (asking them to also extend the information to FWCAC community members), describing initial possibilities for the project and inviting comments and suggestions.

Shortly thereafter the FWCAC Board gave its permission and support for the research, appointing through its cultural protocols a traditional owner appropriate to speak for Country, Mr Clem Lawrie, in the capacity of a Cultural Advisor (Appendix 1). The Flinders University Social and Behavioural Research Ethics Committee subsequently provided its approval (Appendix 1). The FWCAC was then sent a letter of introduction, information sheet and consent form for potential participants (Appendix 2). Access to the lithic assemblages at the South Australian Museum was thereafter facilitated by Dr Keryn Walshe, whose pre-existing working relationship with the FWCAC assisted initial and ongoing communication.

To meet one of the ethical research principles of free and informed community involvement at a level desired by the FWCAC, the author held a meeting with Mr Lawrie (Figure 5.1). The meeting occurred at the Flinders University of

South Australia on 16 November 2015 and was attended by project supervisors Drs Amy Roberts and Alice Gorman. Information on the letter of introduction, information sheet and consent form was thoroughly discussed and Mr Lawrie freely provided his informed consent for his participation (Appendix 2). Mr Lawrie inspected many of the Allen's Cave stone artefacts, including the oldest pieces (Figure 5.2), several from the LGM and an early Holocene 'flaked piece' made from silicified sandstone (Figure 5.3).

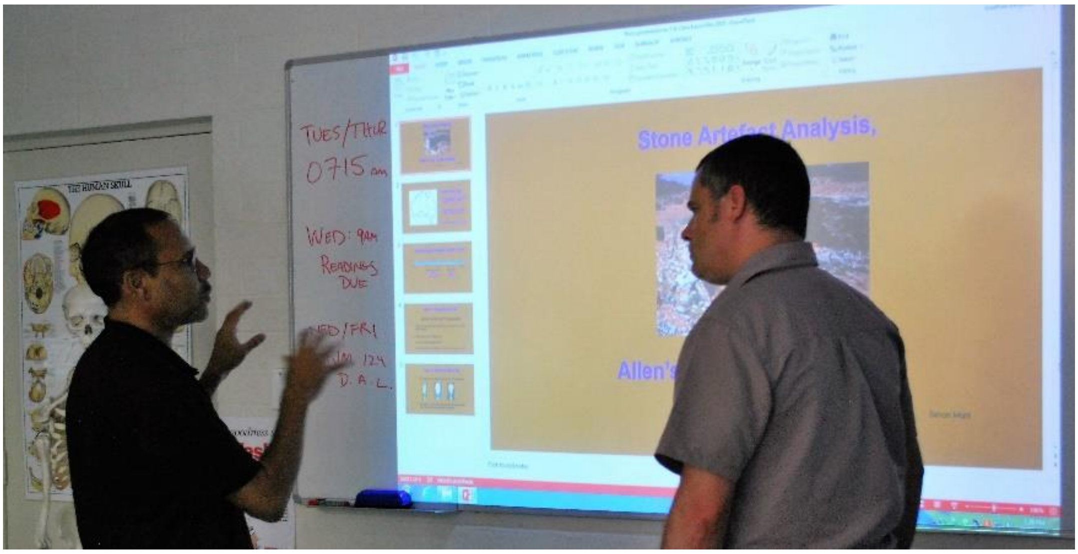


Figure 5-1 Cultural advisor Mr Clem Lawrie, with the author, 16 November 2015. Photo: Amy Roberts.

Figure 5-2 Mr Clem Lawrie holding one of the oldest Allen's Cave lithics, with the author. Photo: Amy Roberts.

Figure 5-3 Mr Clem Lawrie holding a silicified sandstone flaked piece from Allen's Cave, with the author. Photo: Amy Roberts.

Throughout this research regular email updates to the FWCAC were provided. Advice was given of the progress and suggestions and feedback invited in accordance with the ethical research principle of ongoing community consultation (AIATSIS 2012). Updates were addressed to FWCAC Chairperson Mr Basil Coleman, Corporate Services Manager Ms Kerrie Harrison and Cultural Advisor, Mr Clem Lawrie. It was agreed that the FWCAC would endeavour to disseminate information about the project to the broader community and that Mr Lawrie, as Cultural Advisor, would communicate any community wishes, which he would seek according to cultural protocols. A request from a FWCAC member was to investigate whether evidence might exist to indicate whether people using Allen's Cave and Koonalda Cave were from the same cultural group.

The FWCAC requested a community poster be produced and presented to the community following the completion of the research. Mr Lawrie invited the community to express any wishes in relation to the poster, consistent with the ethical research principle of meeting an agreed outcome discussed at the commencement of the project (AIATSIS 2012). The author also volunteered to assist the FWCAC community and Mr Lawrie, upon the completion of this research, in the establishment of a physical display on Country, illustrating the stone technologies used by people occupying Allen's Cave over time.

5.2 Stone Artefact Sample Size

The total sample of lithics analysed was 1116, comprising 988 from the Cane (1995) excavation and 128 from the Marun (1972) excavation. This represents all of the provenanced lithics from Allen's Cave for the time period of focus, c. 40,000–5000 BP (Dr Keryn Walshe 2015, pers. comm.; Chapter 1 [1.9]).

5.3 Stone Artefact Analysis

In order to address the research questions and aims, specific artefact attributes were selected for analysis because of their potential for providing evidence for human behaviours. These attributes are summarised in Table 5.1, while the remainder of the chapter describes the analytical methods. The level of measurement that each artefact attribute/category constitutes is described in brackets and is either 'nominal,' 'ordinal,' 'interval' or 'ratio'. Nominal measures indicate differences existing between categories but no distance relationship (Banning 2000:9; Neuman 2009:127), such as whether an artefact derived from the Marun (1972) or Cane (1995) assemblage. Ordinal measures are for categories with an ordered relationship to each other that is not equidistant (Banning 2000:9; Neuman 2009:127), such as time periods, which are sequential but not consisting of the same number of years. Interval measurements are used when a consistent, equal distance exists between adjacent points on a scale (e.g. 4 and 8 are the same distance apart as 12 and 16) but without reference to an absolute zero, while ratio measurements do the same as interval measurements but with reference to an absolute zero (Banning 2000:9–10; Neuman 2009:127).

Table 5-1 Stone artefact attributes analysed in this thesis and the human behaviours that may be inferred from them via comparisons over time.

Artefact Attribute	Behavioural Indications	References
Typology	Production of artefact ‘types’ based on morphology may indicate the use by knappers of a mental template; standardisation of manufacture may infer production for the purposes of trade and/or a risk reduction strategy e.g. through the production of easily replaceable elements; comparisons could be made of any ‘types’ found at Allen’s Cave with others across Australia to explore the existence of regional technological ‘industries’	Hiscock 1994, 2002, 2005; Horne and Aiston 1924; Howchin 1934; McBryde 1977; McCarthy 1977; Mulvaney 1985; Tindale 1957
Artefact Technological Status	Similar to above but approach is based on classifying artefacts according to technological attributes rather than overall morphology (see Chapter 1); artefact manufacture helps to support inferences re responses to changed environmental conditions	Andrefsky 2008; Andrefsky 2010; Clarkson and O’Connor 2006:160; Shafer 2008:1584–1589
Raw Material	Preferential use of certain materials for the production of particular artefacts; non-local materials could indicate trade/exchange or travel and expansion/contraction of foraging ranges, while use of only local materials may indicate that people’s foraging ranges were relatively restricted–this is an important aspect for consideration of Veth’s (1989) model re his concept of ‘corridors’	Clarkson and O’Connor 2006:198; McBryde 1987; McCarthy 1977; Odell 2000; Roth 1897; Shafer 2008:1584; Tibbett 2006; Veth 1989
Weight	Contributes to classifications of the ‘technological status’ of artefacts; comparisons of these four dimensions with other attributes, such as raw materials, can enable inferences in relation to any changes in artefact manufacture	Andrefsky 2010; Clarkson and O’Connor 2006:182–183; Holdaway and Stern 2004
Length		
Width		
Thickness		
Cortex	Indicates the extent of artefact reduction; this can be compared across different artefacts and raw material types. Relatively high proportions of flakes discarded with cortex indicates that these were manufactured in the early stage of core reduction, suggesting that raw materials were reasonably abundant; low proportions indicates the opposite. Cortex can also reveal the source of the raw material e.g. water rolled cortex indicates the core came from a river	Andrefsky 2010:103–106; Clarkson 2007:35; Dibble et al. 2005; Marwick 2008:1154
Platform Type	The extent of control exerted over the lithic manufacture process e.g. the platform types ‘abraded,’ ‘flaked’ and ‘facetted’ indicate deliberate platform preparation prior to flaking; any patterns may reflect changing reliance on certain artefacts. Inferences can be made based on extents of control exerted e.g. if artefacts were made with relatively minimal investment this may suggest little pressure on raw materials–which may then be compared with other archaeological evidence for implications re population levels	Holdaway and Stern 2004:119–129; Shafer 2008:1585–1586
Platform Width		Clarkson and O’Connor 2006:168; Macgregor 2005; Pelcin 1997
Platform Thickness		
Overhang Removal		Clarkson 2007:32; Clarkson and O’Connor 2006:168; Holdaway and Stern 2004:143–144
Termination Type		Andrefsky 2010:29,87–88; Cotterell and Kamminga 1987:698–703; Holdaway and Stern 2004:132–133
Retouch Margins	Comparison of retouch across raw materials may demonstrate certain preferences. The invasiveness and type of retouch can indicate extents and types of uses e.g. notched retouch is often indicative of hafting, potentially a risk minimisation strategy	Andrefsky 2010:171; Clarkson 2002b; Clarkson and O’Connor 2006:191–192; Hiscock 1994, 2002, 2007; Holdaway and Stern 2004:157–178
Retouch Type		
Retouch Invasiveness		
Core Type	The intensity of core reduction and the extent of on-site and off-site knapping. Comparisons can be made regarding the extent of exploitation of raw materials, including potential variations in people’s valuing of local vs any non-local materials–which can then be used to infer changes in foraging range and landscape use. Core type can also indicate degree of preparation before flaking, potentially aiding inferences related to people’s control over the knapping process	Clarkson and O’Connor 2006: 168–169; Holdaway and Stern 2004:179–188,194–197; Macgregor 2005
No. of Platforms on Cores		
No. of Negative Flake Scars on Cores		

1. **Artefact Number** (nominal): the number, either written directly onto an artefact by South Australian Museum staff prior to this study (Figure 5.4a) or on the exterior of the plastic bags in which the artefacts were stored (Figure 5.4b), by Marun (1972) and Cane (1995). The artefact number indicates the trench and spit e.g. ‘E4/29’ = trench E4, spit 29.

2. **Marun/Cane** (nominal): this category refers to whether the artefact was excavated by Marun (1972) or Cane (1995). Although this is indicated by the artefact number e.g. ‘E4/…’ was one of Cane’s (1995) trenches while ‘E3/…’ was one of Marun’s (1972), this Marun/Cane category was included for ease of identification for potential future researchers.

Figure 5-4a Artefact number written directly onto an artefact, held by Mr Clem Lawrie. Photo: Amy Roberts.

Figure 5-4 b Mr Clem Lawrie with a labelled plastic bag containing several artefacts. Photo: Amy Roberts.

3. **Time Period** (ordinal): the period used in this thesis from which each artefact originates, either ‘Pre-LGM,’ ‘LGM,’ ‘Between LGM and Early Holocene,’ ‘Early Holocene’ or ‘Post Early Holocene to Mid-Holocene.’ These periods were determined according to the climatic conditions established by a synthesis of environmental data (Chapter 3).

4. **Technological Status** (nominal): this is the classification of a stone artefact based on its technological attributes. Lithics are classified as varieties of 'flakes' and 'cores.'

'Flake,' 'core' and a common artefact attribute, 'retouch,' are defined as follows. A flake is 'a sharp-edged sliver of stone, detached from a core by the application of force' (Holdaway and Stern 2004:42). Flakes also have 'one or more positive conchoidal flake scars' (Hiscock 2007:203). A 'core' is a stone artefact with one or more negative bulbs of percussion and one or more negative flake scars, and no ventral surface. However, a flake can also be a core if there are non-retouch negative flake scars that were clearly removed after the flake was struck from the core. In this case a note is made on the recording sheet that the artefact is a 'flake that has been used as a core' (this definition has been adapted from a range of interpretations provided in Holdaway and Stern [2004:37–40, 179–211]). 'Retouch' (Figure 5.5) is small (< 5 mm), continuous flake scars demonstrating that flakes were removed after a flake was detached from a core (adapted from Holdaway and Stern 2004:33).

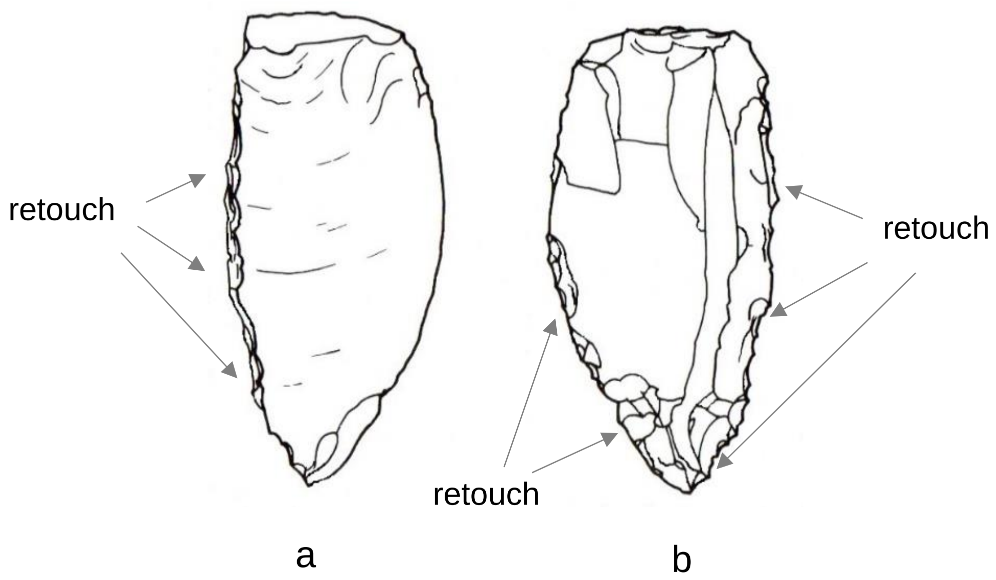


Figure 5-5 Retouched flake; **a** = ventral surface; **b** = dorsal surface. Adapted from Veth (1993:17).

Each stone artefact is classified technologically according to one of the following categories.

(i) ‘Complete flake’: a flake that has a ventral surface, evidence of the point or area of impact by the hammerstone i.e. the point of force application (‘pfa’) and/or platform; margins sufficiently intact to enable metric measurements and a termination (Figure 5.6a);

(ii) ‘Proximal flake’: a broken segment of a flake with a pfa or platform, but no termination (Figure 5.6b);

(iii) ‘Medial flake’: a broken segment of a flake with an identifiable ventral and/or dorsal surface but no pfa or platform and no termination (Figure 5.6b);

(iv) ‘Distal flake’: a broken segment of a flake with a termination but no pfa or platform (Figure 5.6b);

(v) Flaked piece: a fragment that cannot be definitively identified as a proximal, medial or distal flake or any other kind of artefact but which displays attributes associated with the knapping process, e.g. the same raw material as other identified artefacts, fracture planes, and/or that it can conjoin with another artefact (Holdaway and Stern 2004:114–115);

(vi) ‘Unidirectional core’: a core on which negative flake scars demonstrate that flakes have been struck from one or more platforms on the core, in one direction (Andrefsky 2010:82; Holdaway and Stern 2004:180; Figure 5.6c). ‘Unidirectional core’ is preferred over the similar ‘blade core’ because the former caters for negative flake scars of all lengths and widths whereas the latter, using ‘blade’—a flake whose length is at least twice that of its width (Holdaway and Stern 2004:16)—implies exclusion of cores with shorter negative flake scars. Backed artefacts were formerly termed ‘backed blades’ because they were commonly made from blades, which associated them with ‘blade cores’ (e.g. Bowdler 1981; Bowdler and O’Connor 1991:53–55). Backed artefacts, however, are also produced from cores with negative flake scars of a range of sizes, which the new term emphasises (Hiscock and Attenbrow 1996:64); and

(vii) ‘Multidirectional core’: a core on which flakes have been struck from two or more platforms, in different directions (Andrefsky 2010:82; Holdaway and Stern 2004:180; Figure 5.6d).

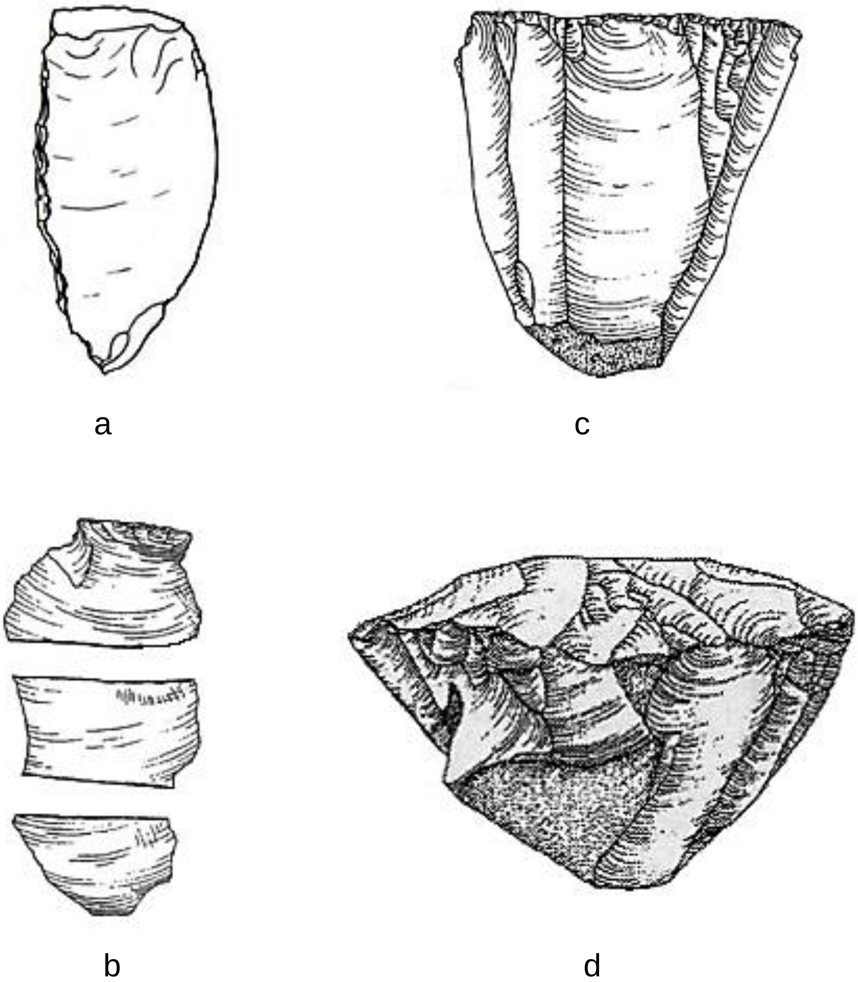


Figure 5-6 Some technologically classified artefacts; **a**: complete flake, ventral surface and with retouch (adapted from Veth 1993:17); **b**: proximal flake, medial flake, distal flake (adapted from Andrefsky 2010:88); **c**: unidirectional core (adapted from Andrefsky 2010:146); **d**: multidirectional core (adapted from Andrefsky 2010:147).

5. **Typology** (nominal): the 'typological types' defined below have been selected because they are widely accepted amongst Australian (and other) archaeologists.

(i) Scraper: many definitional variations exist across the world, but in this study a scraper is identified as a flake with one or more margins of continuous retouch. Scrapers are then further sub-divided using a scheme commonly used in Australia (Holdaway and Stern 2004:230), so as to assist potential future comparisons. The scheme, proposed by Jones (1971:339–452; examples also in Fullagar and Jones [2004:81, 87–88]), focusses on edge properties using the following classifications:

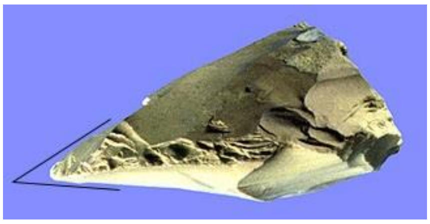
(a) round-edged scraper: a flat scraper with curved, neatly retouched edges (Jones 1971:340; Figure 5.7a);

(b) flat-edged scraper: a scraper with long, straight edges, minimally invasive retouch (<25%) and edge angles with a mean of 66.6° ± 12.4° (adapted from Jones 1971:404; Figure 5.7b);

(c) steep-edged scraper: a scraper with edge angles equal to or greater than 60° (adapted from Jones 1971:402; Figure 5.7c). An artefact is identified as a steep-edged scraper if it also has retouch on more than one margin because this differentiates such an artefact from a backed artefact (see below); and

(d) concave and nosed scraper: a scraper with one or more retouched projections and associated concavities (Jones 1971:425; Figure 5.7d).

a



b

c

d

Figure 5-7 Typologically classified scrapers; **a:** a round-edged scraper; **b:** a flat-edged scraper; **c:** a steep-edged scraper; **d:** a concave and nosed scraper. Figures adapted from Holdaway and Stern (2004:231–232).

(ii) Backed artefact: a flake with 'steep retouching along one margin...(with) near 90° bidirectional retouch' (Hiscock 1994:270; Figure 5.8), commonly but not always manufactured from blades, with the backed edge opposing a chord. Bidirectional retouch, frequently present, is often the result of bipolar flaking (Hiscock 1994:270), and 'steep' retouching is regarded as ≥60° (Jones 1971:402);

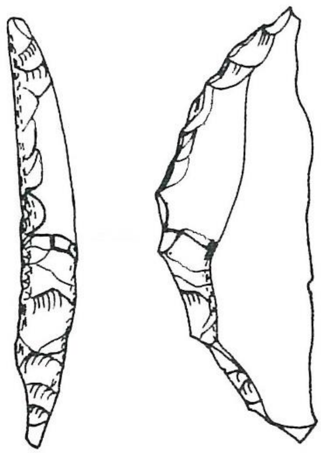


Figure 5-8 A backed artefact. After White and O'Connell (1982:108).

(iii) Tula (Figure 5.9a): semi-circular artefact when viewed in plan, with a pronounced bulb of percussion, a platform that is typically large, broad (i.e. wider than artefact width) and gullwing (curved), and retouch scars present only on the dorsal surface of the distal end (Hiscock and Veth 1991:332–339);

(iv) Tula slug (Figure 5.9b): a tula that has been used and/or resharpened, at its distal end, usually resulting in abundant step scars, to an extent whereby it can no longer be retouched. Typically the platform dimensions and the artefact's width do not change during reduction/maintenance because these aspects are not modified (Hiscock 2008:215; Hiscock and Veth 1991:335);

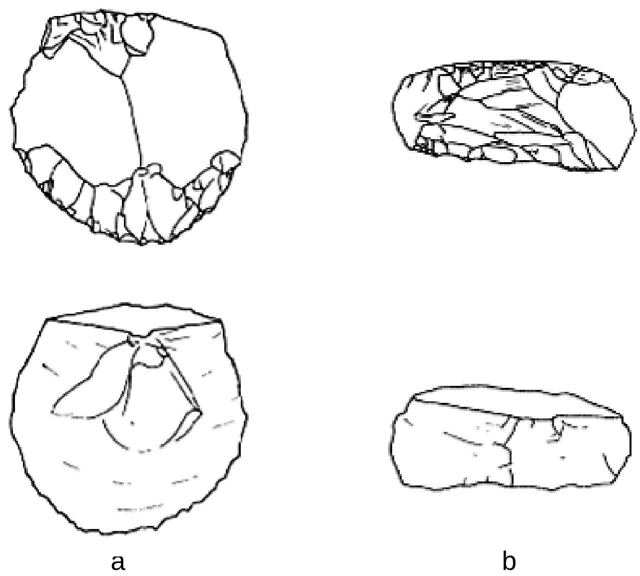


Figure 5-9 Tulas; **a:** tula, **b:** tula slug. Adapted from Hiscock and Veth (1991:334).

(v) Point (Figure 5.10): an artefact whose base is flat or rounded but not concave, whose lateral margins converge to a point and retouch is present on one or both lateral margins; a point can be unifacial or bifacial (Hiscock 1994:268; Holdaway and Stern 2004:266). The category 'Bondi point,' which Marun (1972) used, was for distinguishing a particular kind of asymmetrical backed point. 'Bondi points' as a classification is generally no longer used because such lithics are grouped into backed artefacts, which emphasises the backing and that backed artefacts involve a range of morphologies (Hiscock and Attenbrow 1996:64);

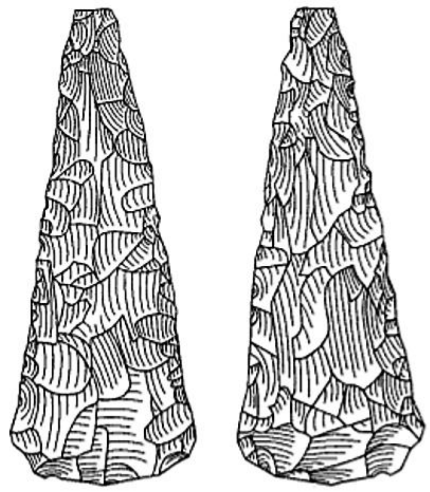


Figure 5-10 A bifacial point. Adapted from Schrire (1982).

(vi) Horsehoof core (Figure 5.11): a discoidal, high-domed core with stacked step fracturing (often around the circumference of the platform) and a single circular or ovoid shaped platform (adapted from Akerman 1993:126, Kamminga 1982:85–91 and Holdaway and Stern 2004:203). Horsehoof cores were first identified by Tindale and Macgraith (1931:281) and are often associated with the now no longer recognised Kartan stone tool industry (e.g. Lampert 1981:146).

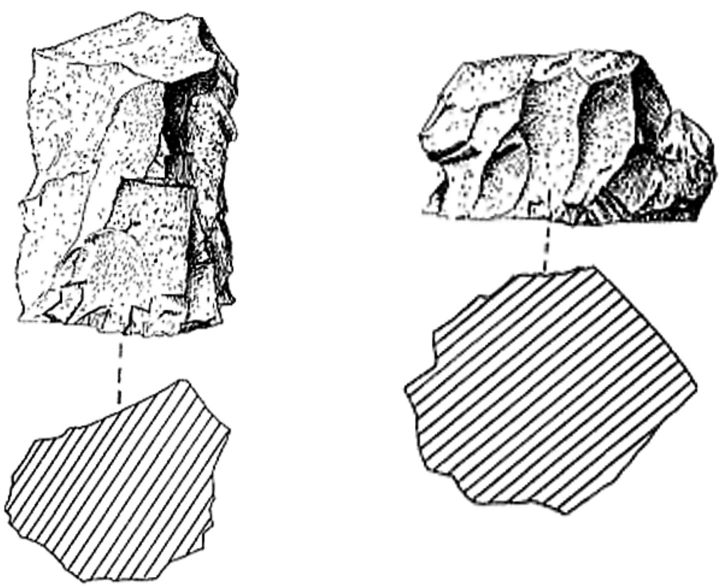


Figure 5-11 Horsehoof cores. Adapted from Gould (1971:152).

Raw material (nominal): a range of research is drawn upon to arrive at the criteria described below for identifying stone artefact raw materials.

(i) Chert: this raw material is highly conducive to effective conchoidal fracturing due to the fact that it is isotropic, siliceous and brittle. Chert is a fine-grained, sedimentary rock that can form in limestone and may occur in a variety of colours including white, brown, yellow-grey, red, black, blue, pink and green (Rapp 2009:76; Shafer 2008:1583). Chert shares properties with flint, such as in its chemical composition, and both materials are similarly fine-grained, microcrystalline and highly siliceous (e.g. Rapp 2009:76–79). Geologists and other researchers have thus at times used the terms 'chert' and 'flint' interchangeably, with some considering one to be a variety of the other and others arguing that there is no compositional or practical difference between the two (see discussion in Luedtke 1992; Whittaker 1994:70).

Distinctions are often made according to conventions used in different regions of the world and on the basis of colour. Rapp (2009:76, 79), for example, argues that 'flint' should be reserved for blacker, denser material such as in the ubiquitous English chalks, largely because this colour was a basis for the origin of the term. Holdaway and Stern (2004:23) also argue that chert, unlike flint, is common in Australia. Cane (1995:9, 11–13, 16–17, 22, 25–30, 32–34, 43) identified many of the stone artefacts from Allen's Cave as 'flint,' however for the purposes of this thesis the lighter colours and textures of the Allen's Cave lithics are more congruent with contemporary descriptions of chert (e.g. Rapp 2009:76).

(ii) Chalcedony: highly siliceous and suitable for conchoidal fracturing, this raw material is similar to chert as it is microcrystalline. Chalcedony is a sedimentary material that can form from varieties of chert and/or opal (Cetin et al. 2013:76, 79; Dr Alan Watchman 2015, pers. comm.; Rapp 2009:80) and the properties that are used to distinguish chalcedony from other materials are its fibrous rather than granular structure (Nash and Ullyott 2007:108; Schmidt et al. 2013:332), its waxy lustre (due to the presence of the mineral moganite), its semi-transparency or translucence and by the fact that it is often white in colour (Rapp 2009:76, 80).

(iii) Calcrete: this raw material typically occurs near the surface and is composed predominantly of calcium carbonate (Goudie 1972; Wright 2007:10). Although often low in silica it can be silicified by the saturation of groundwater leading to the diagenetic replacement of existing calcite/dolomite/sepiolite (Arakel 1986:296; Wright 2007:10). On occasion silica can then become the main constituent, as demonstrated by chemical composition studies in calcretes from St Vincent's Basin, South Australia (Dixon 1994:91). In the western Eyre Peninsula calcrete evolved from carbonate dust into nodular form (Twidale and Bourne 2000:93). Calcrete does not fracture conchoidally and is often distinguishable from other raw materials by the presence of black spots which reflect sedimentary deposition rather than formation only from carbonate on the surface (Dr Alan Watchman 2015, pers. comm.).

(iv) Silicified sandstone: this sedimentary rock is composed of round or angular particles of sand cemented by silica (Holdaway and Stern 2004:21; Rapp 2009:54). It is formed as a result of marine and terrestrial processes that introduce silica into existing sandstone, and is similar to silcrete (Webb et al. 2013:131). Distinguishing silicified sandstone from silcrete is possible because silcrete tends to fracture more smoothly through the grains and, unlike silicified sandstone, is characterised by 'cream-coloured streaks of very fine-grained anatase (titanium oxide)' (Webb et al. 2013:131).

6. **Artefact colour** (nominal): the colour of each stone artefact was determined by macro-observation with reference to the Munsell colour chart system for rocks and was recorded so as to assist in the identification of raw materials.

8. **Artefact weight** (ratio): using digital scales, weight was measured for every artefact to the nearest whole gram, in order to facilitate broad comparisons of morphological change with the same unit of measurement used by Marun (1972) and Cane (1995).

9. **Artefact length** (ratio; Figure 5.12a): measured to the nearest millimetre with digital Vernier callipers, adhering to the following conventions (Holdaway and Stern 2004:137–139, 188–189):

(i) Complete flakes: from the pfa to the furthest point of the distal end (see Figure 5.12a);

(ii) Proximal flakes: from the pfa to the mid-point along the broken edge;

(iii) Medial flakes: from the mid-point of each opposing broken edge;

(iv) Distal flakes: from the furthest point at the distal end to the mid-point on the broken edge; and

(v) Cores: the distance between the two furthest points in any direction.

10. **Artefact width** (ratio): recorded to the nearest millimetre with digital Vernier callipers, width was measured perpendicular to artefact length, at the mid-point (Holdaway and Stern 2004:139; Figure 5.12b).

11. **Artefact thickness** (ratio): recorded to the nearest millimetre with digital Vernier callipers, thickness was measured perpendicular to artefact width, at its mid-point (Holdaway and Stern 2004:140).

12. **Cortex** (the outer surface of a rock) (ratio): recorded as present or absent. If present the extent of cortex was then estimated as a percentage of the

surface area it occupied according to the following ranges: 1%–25%, 26%–50%, 51%–75%, and 76%–100% (adapted from Holdaway and Stern 2004:144). Cortex cannot exist on the ventral surface of flakes but it can potentially constitute the entire external surface of a core.

13. **Platform type** (nominal): classified according to the following varieties:

(i) Flaked: one or two flakes have been removed (Holdaway and Stern 2004:120);

(ii) Facetted: three or more flakes have been removed (Holdaway and Stern 2004:120);

(iii) Cortical: cortex covers the platform, demonstrating that the platform surface was not modified (Andrefsky 2010:94);

(iv) Natural: the surface is not cortical but has no evidence of modification (Holdaway and Stern 2004:120);

(v) Abraded: the platform's surface has been ground (Holdaway and Stern 2004:120); or

(vi) Crushed/Shattered: the platform surface has been damaged such that no attributes can be recorded (Holdaway and Stern 2004:120).

14. Platform thickness (ratio): recorded to the nearest millimetre with digital Vernier callipers; platform thickness is measured perpendicular to platform width, at the maximum distance between the ventral and dorsal surfaces of the platform (Holdaway and Stern 2004:124; Figure 5.12c).

15. Platform width (ratio): recorded to the nearest millimetre with digital Vernier callipers; platform width is measured as the maximum distance from one lateral margin on the platform to the other (Andrefsky 2010:94; Holdaway and Stern 2004:124; see Figure 5.12d).

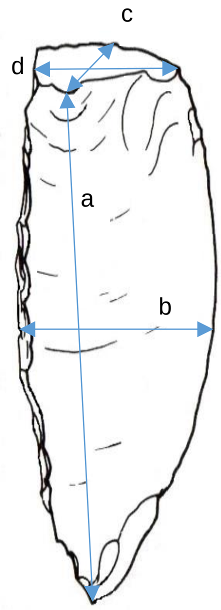


Figure 5-12 Measurement methods for several artefact attributes; **a**: artefact length; **b**: artefact width; **c**: platform thickness; **d**: platform width. Image adapted from Veth (1993:17).

16. **Overhang removal** (nominal): overhang removal is constituted by small, continuous negative flake scars on the dorsal surface of a flake, that were created by a knapper removing an overhanging 'lip' from the platform before the flake was detached from a core (Clarkson 2007:29, 31–32; Shafer 2008:1586–1587). Removing this 'lip' strengthened the platform, which maximised the chance of successful flaking (Clarkson 2007:32; Clarkson and O'Connor 2006:185; Shafer 2008:1585–1586). There is no minimum number of negative flake scars that defines overhang removal because of differing sizes of the stone on which it occurs and the varying sizes of the 'lip' across different artefacts that needed removing. The proximal edge visible on a flake may in fact represent what remains from earlier overhang removal. Overhang removal was recorded as present or absent.

17. **Termination type** (nominal; Figure 5.13): a termination occurs where the force applied to the platform exited a core, detaching the flake (Clarkson 2007:27–29; Cotterell and Kamminga 1987:698–703). When a termination was present its type was recorded as one of the following:

(i) Feather: smooth and thin, with an acute angle (< 90°) between the ventral and dorsal surfaces (Andrefsky 2010:20; Clarkson 2007: 29; Figure 5.13a);

(ii) Hinge: caused by the force exiting in an outward direction from the core at approximately 90° (Clarkson 2007:29; Figure 5.13b);

(iii) Step: an abrupt, right-angle break (Andrefsky 2010:20; Holdaway and Stern 2004:130; Figure 5.13c); or

(iv) Plunge (also 'outrepassé'): caused by the force travelling back toward the core before exiting on the opposite side (Andrefsky 2010:20; Clarkson 2007:29; Holdaway and Stern 2004:130; Figure 5.13d).

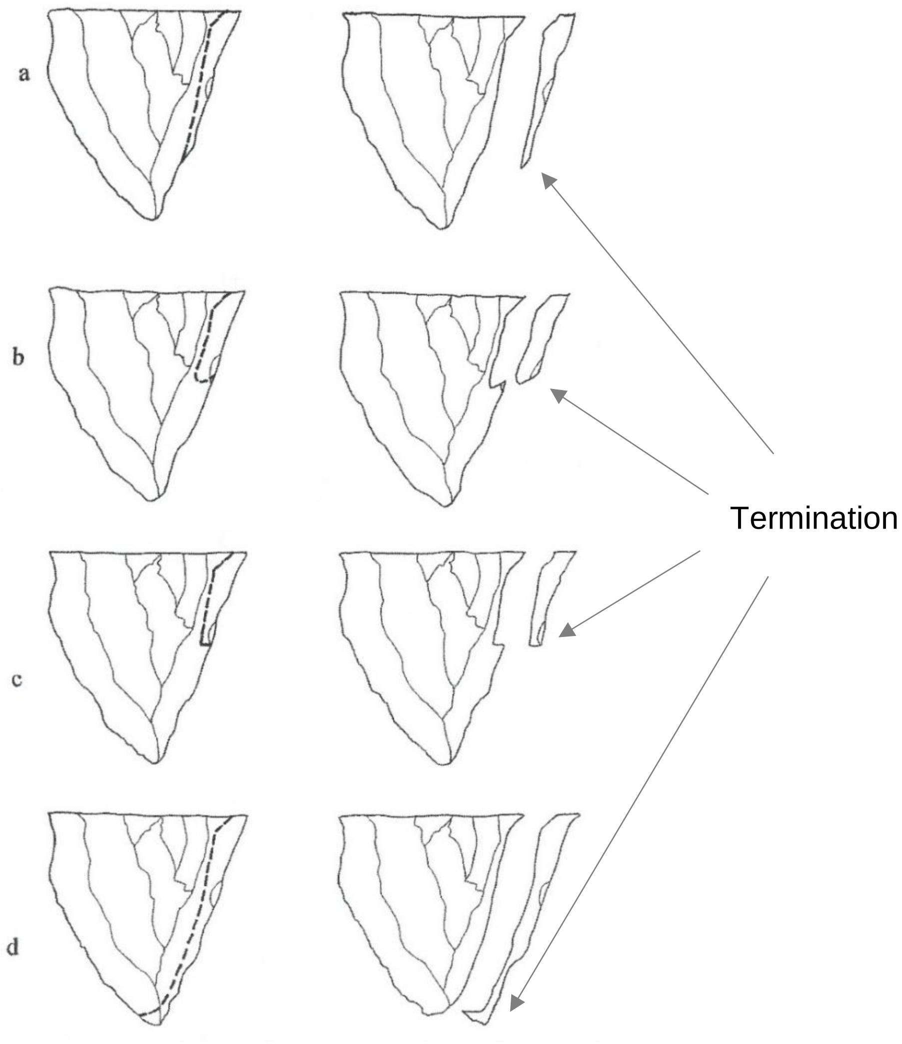


Figure 5-13 Flake termination types: **a** = feather; **b** = hinge; **c** = step; **d** = plunge. Adapted from Andrefsky (2010:21).

18. **Retouch margin count** (ratio): the number of flake margins on which retouch occurs. Individual margins on a flake are considered to be, when viewed with the dorsal surface facing up, 'dorsal left,' 'dorsal right,' 'dorsal proximal' (which constitutes 'overhang removal'), 'dorsal distal,' 'ventral left,' 'ventral right,' 'ventral proximal' and 'ventral distal.' If retouch extends onto both faces where the adjoining margins intersect, this is deemed to be two margins exhibiting retouch.

19. **Retouch type** (nominal): this was classified as one of the following kinds:

(i) Steep: consistent with above descriptions of steep-edged scrapers and backed artefacts, this is retouch at an angle greater than 60°;

(ii) Scalar: shallow retouch appears as 'scale-like flake scars' (Holdaway and Stern 2004:163; Figure 5.14) and creates a flat, concave edge when viewed in cross-section (Lemorinie et al. 2016:3);

(iii) Serrated: 'notching that forms a series of extremely small or fine projections, usually triangular in outline' (adapted from Akerman and Bindon 1995:91; Figure 5.14);

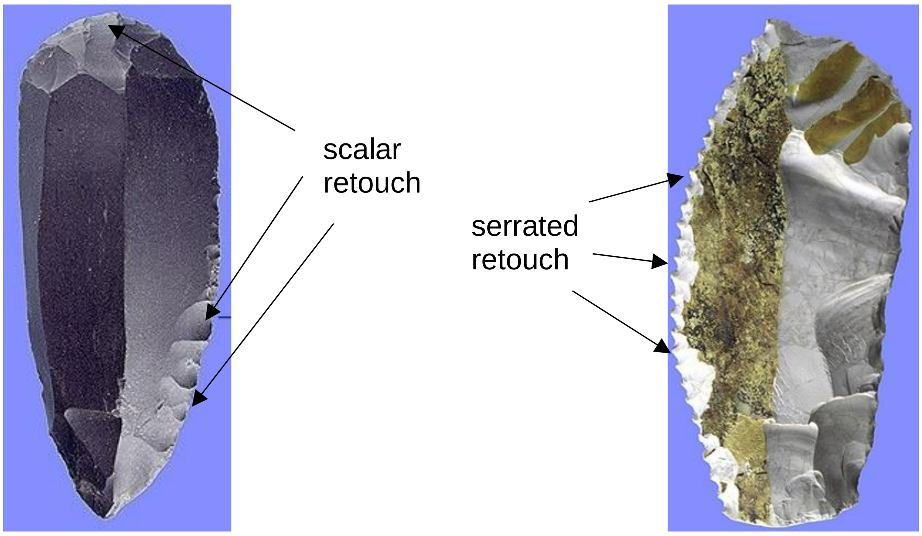


Figure 5-14 Scalar and serrated retouch. Adapted from Holdaway and Stern (2004:164, 166).

(iv) Dentated: where the projections or ‘teeth’ are similar to each other in width but narrower than the notches that separate them (Akerman and Bindon 1995:91);

(v) Denticulated: as for ‘dentated’ but the teeth are wider than the notches (Akerman and Bindon 1995:91)—as Marun (1972:158) did not specify dimensions, the ‘spurs’ that he observed are considered as likely to correspond with both dentated and denticulated artefacts; or

(vi) A specified combination of these retouch types: used for when an artefact displayed more than one type e.g. ‘scalar and serrated.’ The extent of the presence of each type could vary on an individual artefact, e.g. one edge may be fully retouched with one retouch type while the other edge may only be partly retouched with a different retouch type.

20. Retouch invasiveness (ratio): Retouch invasiveness can be measured in many ways, with studies that focus specifically on retouch invasiveness often using Clarkson’s (2002b) ‘Index of Invasiveness’ or Kuhn’s (1990) ‘Geometric Index of Reduction.’ For this study, when retouch was present its invasiveness was described as a percentage estimate of the extent of retouch on the surface area of the artefact, considering both the ventral and dorsal surfaces. Estimation was used according to four categories: 1%–25%, 26%–50%, 51%–75%, and 76%–100%.

Data was entered into the programme *IBM Statistical Package for the Social Sciences, Statistics Base Grad Shrinkwrap version 23.0* (SPSS; Appendix 5). SSPS is one of the most commonly used programmes in the social sciences. It enables the statistical analysis of individual and collective stone artefact attributes from a range of perspectives as well as the creation of tables and graphs.

Some artefact attribute descriptions were more accurately reflected by calculating the mean, while for others the median was more representative. For many attributes, a Levene’s Test was performed in order to test the equality of variances and this showed that in all cases equality of variances could be assumed. The statistical significance of differences between various artefact attributes was tested using independent samples t-tests, ANOVA and post-hoc Tukey tests and a Mann-Whitney U test.

Evidence of heating artefacts prior to flake detachment so as to improve flaking qualities, a common strategy among prehistoric societies (Domanski and Webb 1992:61), was not analysed in this study for several reasons. Macroscopically, heat treatment can be indicated by a greasy lustre and/or a darkening of colour, but the existence of these traits varies among rock types (e.g. Flenniken and White 1983:44–45; Mercieca and Hiscock 2008; Salomon et al. 2015) and any lustre can potentially be removed by taphonomic processes such as weathering and bioturbation (Domanski and Webb 1992:602; Price et al. 1982). Heat treatment decreases fracture toughness, so experimentally comparing the fracture toughness of known heated and unheated samples could indicate heat treatment (Domanski and Webb 1992:602).

The difficulty implementing such heat treatment tests on the Allen's Cave lithics is that the testing is a potentially destructive process (Domanski and Webb 1992:606). A less destructive method of testing fracture toughness involves examination of microstructural changes that occur on heat treated artefacts, using scanning electron microscopy, x-ray diffraction or infra-red absorption microscopy (Domanski and Webb 1992:610–612; e.g. Salomon et al. 2015). Employing such methods is beyond the scope of this project, and although the hearths at Allen's Cave may have led to the heating of some lithics, distinguishing natural and deliberate exposure to heat using solely macroscopic observations is 'almost impossible' (Clarkson and O'Connor 2006:176).

5.4 Chapter Summary

The methods of technological lithic analysis described in this chapter are based on extensive national and international research into stone fracture mechanics and on broadly accepted measurement conventions (Andrefsky 2008, 2009, 2010; Clarkson 2006; Clarkson and O'Connor 2007; Cotterell and Kamminga 1987; Hiscock 2007; Lemorinie et al. 2016; Macgregor 2005; Odell 2000, 2001; Shafer 2008). Technological artefact attributes selected for analysis have been demonstrated to be indicative of particular human behaviours (Table 5.1). Analysis of these attributes provides a robust foundation for the investigation of the research questions and aims. Explicit descriptions of the extents of precision and accuracy of equipment, measurement and recording techniques ensure that this project is replicable. Research methods meet ethical standards for working with traditional owners, the FWCAC, whose engagement reflects the significance to them of this project.

Chapter 6: Results

Broad results spanning c. 40,000–5000 BP are initially presented in this chapter, in order to provide an overall impression of the stone artefact assemblage. The remainder of the chapter presents results in specific time periods in accordance with the research questions and aims. Key trends showing the extent of technological continuity and/or adaptation in response to the LGM and early Holocene are highlighted.

6.1. Results for c. 40,000–5000 BP

Twenty pieces of stone were excluded from the analysis because they were not artefactual. This conclusion was based on the absence of a ventral surface, platform, ring crack, fissures, compression waves, termination, retouch and any other characteristics associated with the knapping process, such as the ability of the stone to be conjoined with another artefact. These twenty stones of Nullarbor Limestone were most likely related to roof fall.

Of the 1116 Allen's Cave lithics remaining, the majority (n=826) were flaked pieces. This left 223 flake varieties, comprising complete flakes (n=148) and broken flakes (n=75 [53 unretouched and 22 retouched]), along with 67 cores (Table 6.1).

Table 6.1 shows that cores were rare at only 6% (n=67) of the analysed Allen's Cave assemblage. Retouch, as a percentage of flakes and flaked pieces, constitutes 7% (n=77) of the lithics, with unretouched flakes comprising 13% (n=146). Excluding flaked pieces, retouch on flakes represents 35% of the artefacts in the assemblage, with unretouched flakes at 65%. Of complete flakes (n=148), 37% (n=55) were retouched. Of the broken unretouched flakes (n=55), almost all were proximal flakes, at 87% (n=46). Retouch is considered further in relation to time periods in 6.2.6.

The minimal number of once-complete flakes can also be calculated from Table 6.1. By definition, proximal flakes (n=60 [46 unretouched, 14 retouched]) were originally complete flakes, so prior to breakage there were at least 60 more complete flakes (Figure 6.1) in the assemblage. The medial and distal flakes totalled 15, of which four were longitudinally fractured. The minimum number of originally complete flakes in a given assemblage can be calculated by adding the flakes with platforms (i.e. complete and proximal flakes; n=148 and 60 respectively) with half the number of longitudinally split flakes (Holdaway and Stern 2004:115). On this basis, the Allen's Cave assemblage analysed comprised a minimum of 210 once-complete flakes**.** Because of the small size of the Allen's Cave flakes (see below) it is impossible to determine whether the flaked pieces, which themselves are very small (mostly 3–10 mm) derived from knapping shatter or breakage from flakes. Taphonomic factors may also have influenced their numbers.

Table 6-1 Technological classifications of the Allen's Cave stone artefacts.

Technological Classification	Number of Artefacts	Percent
Complete flake, no retouch	93	8.3
Proximal flake, no retouch	46	4.1
Medial flake, no retouch	5	0.5
Distal flake, no retouch	2	0.2
Complete flake, with retouch	55	4.9
Proximal flake, with retouch	14	1.3
Medial flake, with retouch	2	0.2
Distal flake, with retouch	6	0.5
Flaked piece	826	74
Unidirectional core	36	3.2
Multidirectional core	31	2.8
Total	1116	100

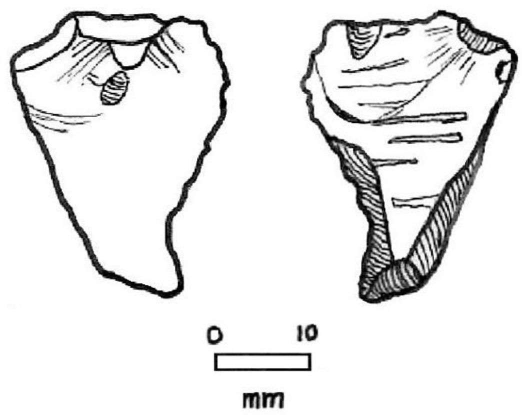


Figure 6-1 A complete unretouched flake from the early Holocene, E3 spit 23.

Few widely accepted ‘typological’ pieces were identified in this study (n=60; 5.4%; Table 6.2). Table 6.2 shows that all, aside from a solitary horsehoof core (Figure 6.2), were varieties of scrapers (Figure 6.3). However, the horsehoof core is noteworthy, because at only 37 mm in length and 22 mm in width and thickness, it is considerably smaller than typical horsehoof cores. The absence of tulas is not particularly surprising given that the focus is c. 40,000–5000 BP and evidence indicates that tulas were used from the mid-Holocene onwards (e.g. Hiscock and Veth 1991:341–342; Holdaway and Stern 2004:224; Marwick 2009:16; Smith 2006:378; Veth et al. 2011b:9–10). No tulas were observed from Marun’s (1972) E3 trench for the mid-late Holocene. Cane (1995) did not observe any tulas and it is therefore most likely that those identified by Marun (1972; Table 4.4) are present in the unprovenanced lithics from Marun’s (1972) remaining trenches (Chapter 1 [1.9]).

Similarly, the backed artefacts, Bondi points and elouera observed by Marun (1972; Table 4.4) are likely among these apparently unprovenanced lithics. Cane (1995; Table 4.8) did not provide details of which specific lithics he identified as backed artefacts (n=2) and tektites (n=2) but in any case neither kind of stone artefact was observed from either assemblage in this analysis. The horsehoof core in Table 6.2 is included in the overall core tally but isolated here because it was the only formal ‘type’ of core.

Table 6-2 Typological classifications of the Allen's Cave stone artefacts.

Typological Classification	Number of Artefacts	Percent of Complete Flakes	Percent of Entire Assemblage
Round-edged scraper	34	23	3
Steep-edged scraper	1	0.7	0.1
Flat-edged scraper	24	16	2.2
Concave and nosed scraper	–	–	–
Horsehoof core	1	n/a (not a flake)	0.1
Backed artefact	–	–	–
Tula	–	–	–
Tula slug	–	–	–
Point	–	–	–
Other	–	–	–
Total	60	39.7	5.4

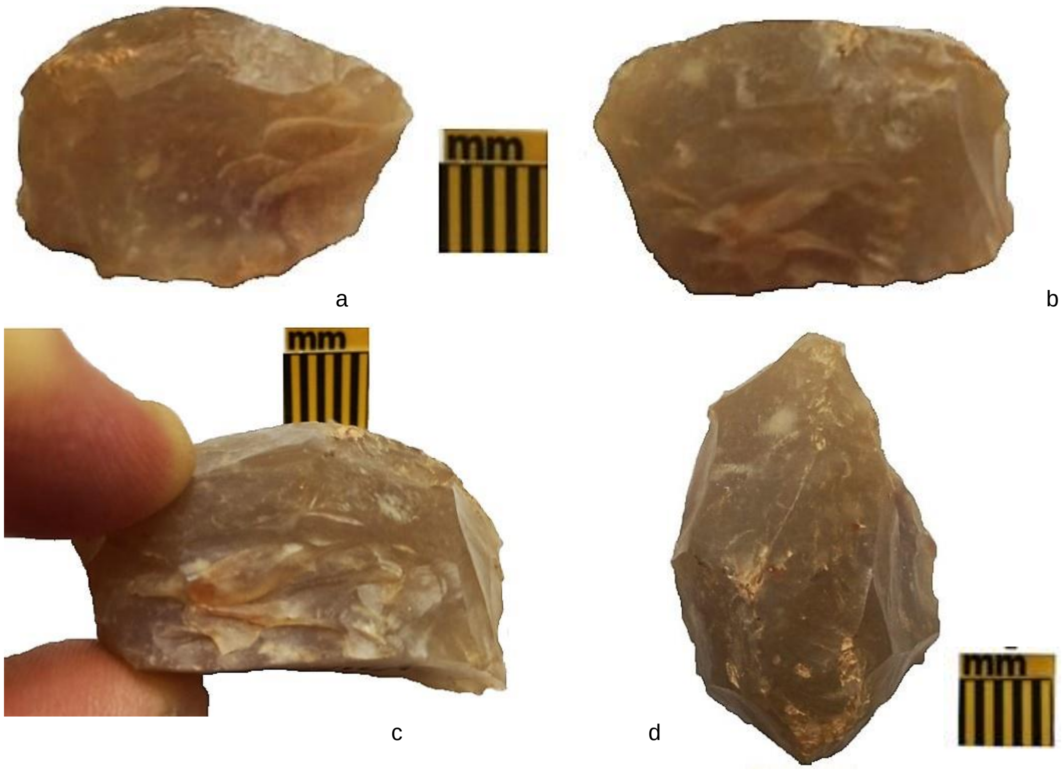


Figure 6-2 A horsehoof core, E3.16.1; **a** and **b:** profiles; **c:** stacked step fractures; **d:** plan.

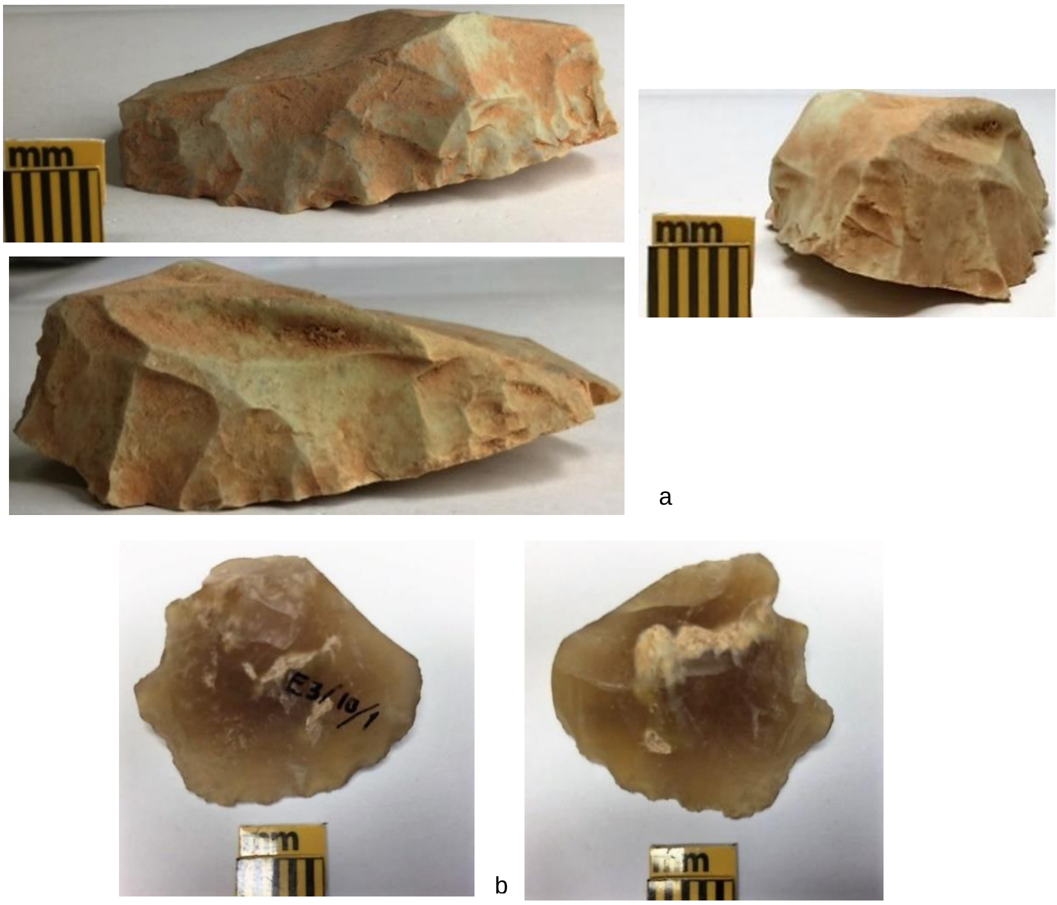


Figure 6-3 Typologically classified scrapers; **a:** steep-edged, E4/24; **b:** flat-edged, E3/10/1.

The dominant raw material used for stone artefacts at Allen's Cave was chert, with chalcedony also featuring relatively prominently (Table 6.3). Marun (1972:254) and Cane (1995:28) observed, without specifying their criteria, 81% and 78% of the lithics respectively as 'flint.' The chert identified at 65% (Table 6.3) is the same material. Of particular note in Table 6.3 is the single artefact of silicified sandstone, discussed in Chapter 7 (7.5). Raw materials for each kind of artefact and during each time period are specified in the following section.

Table 6-3 Total of raw materials used for stone artefacts.

Raw Material	Number of Artefacts	Percent
Chert	727	65.1
Chalcedony	341	30.6
Calcrete	47	4.2
Silicified Sandstone	1	0.1
Total	1116	100

6.2 Results According to Time Periods

The results of the lithic analysis for each time period are presented below. Comparisons can therefore be made in order to best address the research questions and aims.

6.2.1 Artefact Totals

Table 6.5 indicates the nature of artefact manufacture by showing the number of stone artefacts of each technological classification. Flaked pieces constitute the vast majority of lithics for each time period, at an overall proportion of 74%, and breakage was relatively rare, with complete flakes predominating. The proportions of technologically classified artefacts were reasonably consistent over time, with some exceptions such as the 48 of 67 cores being deposited between the LGM and early Holocene. The intensity of artefact manufacture over time is best considered in conjunction with Table 6.5. Further results reflecting the nature of artefact manufacture, such as retouch, are presented throughout this chapter.

Table 6-4 Total number of artefacts of each technological classification, per time period.

Time Period	Artefact Technological Classification											
	Cmpl. flake no r/t	Prox. flake no r/t	Med. flake no r/t	Dist. flake no r/t	Cmpl. flake with r/t	Prox. flake with r/t	Med. flake with r/t	Dist. flake with r/t	Flaked piece	Uni-direct'l core	Multi-direct'l core	Total
Pre–LGM	3	5	–	–	2	1	–	–	16	–	–	27
LGM	1	3	–	–	3	–	–	–	26	3	1	37
Between LGM & Early Holocene	51	28	1	1	30	8	2	5	398	27	21	572
Early Holocene	14	5	3	–	7	3	0	1	139	1	5	178
Post Early Holocene to Mid–Holocene	24	5	1	1	13	2	–	–	247	5	4	302
Total	93	46	5	2	55	14	2	6	826	36	31	1116

The discard rate, of all artefacts, is shown in Table 6.5. Other factors influence population estimations, such as taphonomic processes, intra-site artefact discard location, changes in artefact manufacture and the extent and nature of other archaeological material (Attenbrow 2004:29; Clarkson 2007:130–134; Walshe 1994:254). The large difference from before and during the LGM in comparison to subsequent periods, however, suggests less use of the rockshelter in the former periods. Table 6.5 shows that although there is a considerable increase in raw artefact numbers in the period between the LGM and early Holocene, this translates to a similar discard rate for both the early Holocene and the post early Holocene periods. As a result (along with the other potential influences on population estimations) it is problematic to infer that the post-early Holocene period represented peak human occupation. Note that the pre-LGM period is taken to comprise 10,000 years, given that this is the mid-point between its range of 7000–13,000 years according to the date of initial occupation (39,800 ± 3100 BP; Roberts et al. 1996:15).

Table 6-5 Artefact totals and discard rates per time period.

Time Period	No. of Years	No. of Artefacts	Percent	Mean Artefact Discard Rate
Pre–LGM	10,000	27	2.4	1 per 370 years
LGM	11,000	37	3.3	1 per 297 years
Between LGM and Early Holocene	8000	572	51.3	1 per 14 years
Early Holocene	3000	178	15.9	1 per 17 years
Post Early Holocene to Mid–Holocene	3000	302	21.7	1 per 10 years
Total	35,000	1116	100	1 per 31 years

Of particular importance in relation to the research questions (Chapter 1 [1.6]) is the exploration of the evidence for temporal occupation of Allen's Cave during the LGM. To this end Table 6.6 presents the total artefact numbers from the LGM spits along with their dates BP, according to calculations described in Chapter 4 (4.3.2). The major result demonstrated by this table is that lithics were not present in spits representing 30,000–26,000 BP from either Marun's (1972) or Cane's (1995) assemblages, but that they were throughout all remaining LGM layers (26,000–19,000 BP).

Table 6-6 Stone artefacts present per LGM spit.

Trench /Spit	Assemblage	Time (1000 BP)	Number of Stone Artefacts
E4/41	Cane	30	0
E4/40	Cane	↓	0
E4/39	Cane		0
E4/38	Cane		0
E3/33	Marun		0
E3/32	Marun		0
E3/31	Marun	26	0
E4/37	Cane	26–23.5	9
E3/30	Marun	26–25	1
E3/29	Marun	25–24	1
E3/28	Marun	24–23	0
D2/26	Cane	24–22.5	4
E3/27	Marun	23–22	1
E4/36	Cane	23.5–21	14
E3/26	Marun	22–21	3
E3/25	Marun	21–20	0
E4/35	Cane	21–19	3
E3/24	Marun	20–19	1
Total			37

6.2.2 Raw Materials

Chert was the primary material excavated for each time period (and for c. 40,000–5000 BP; Table 6.3), followed by chalcedony and calcrete (Figure 6.4a–c). No silcrete was observed but a solitary flaked piece of silicified sandstone (Figure 6.4d) was identified from Cane's (1995) trench E4, spit 21, which gives it a date of approximately 11,000 BP. Of the 1116 lithics, 571 (51%) were pale yellowish brown (10 YR 6/2), while 331 (30%) were yellowish grey (5Y 7/2). These two colours accounted for most of the chert and chalcedony, while the next most frequent colour, moderate brown (5YR 4/4), predominantly represented the calcrete, at 44 lithics (4%).

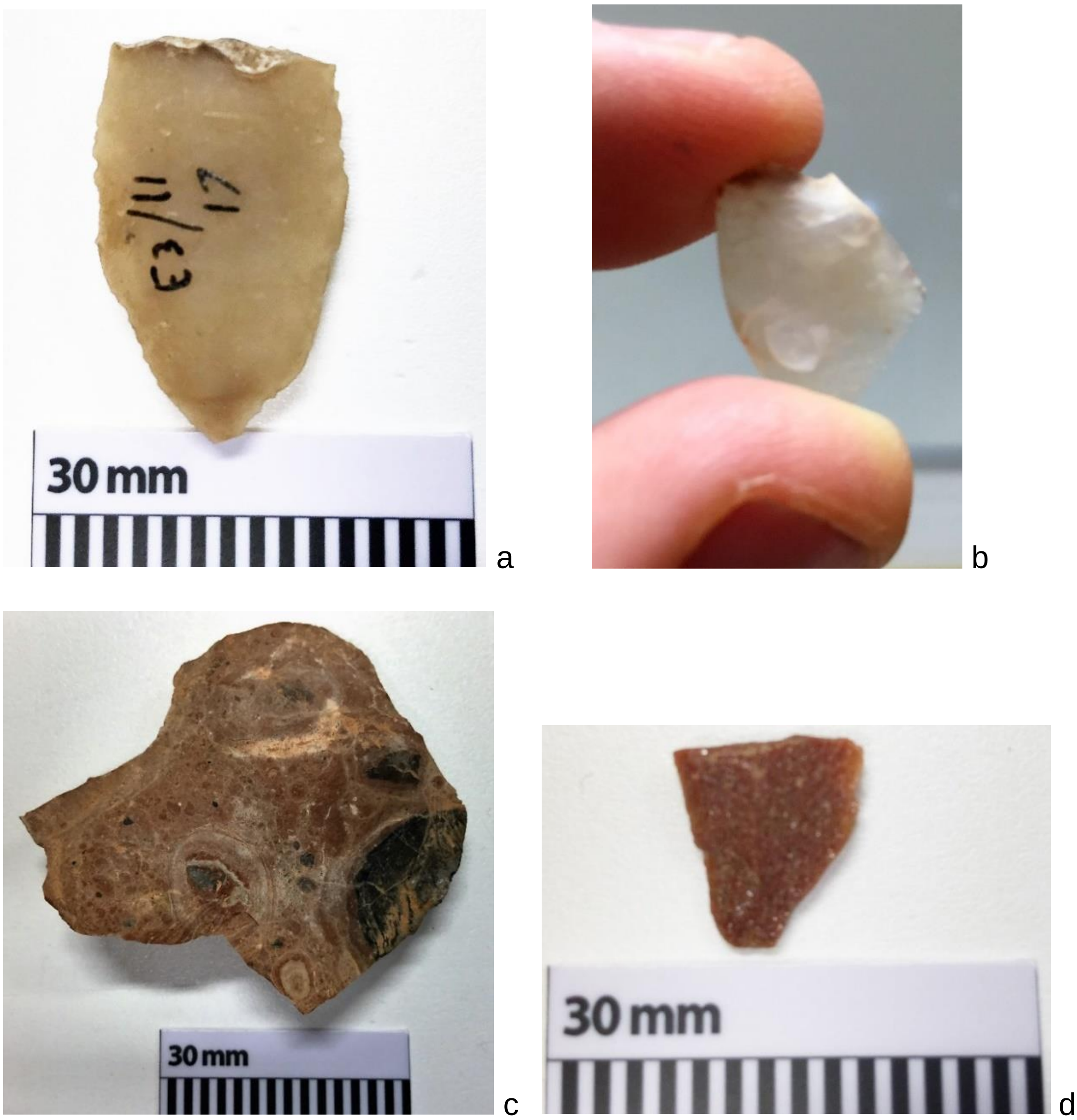


Figure 6-4 Raw materials; **a:** chert (E3/11); **b:** chalcedony (D2/20); **c:** calcrete (D2/29; also one of the oldest artefacts at c. 39,800 ± 3100 BP); **d:** silicified sandstone (E4/21).

Relative proportions of raw materials excavated for each time period can be seen in Table 6.7. Throughout the human occupation of Allen's Cave chert and chalcedony were used for around two-thirds and one-third of artefacts respectively. This is discussed in Chapter 7, along with the behavioural significance of the silicified sandstone artefact and potential reasons for the cessation of calcrete use from the early Holocene (Table 6.7).

Table 6-7 Artefact raw materials per time period.

Time Period	Chert		Chalcedony		Calcrete		Silicified Sandstone		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Pre–LGM	21	78	2	7	4	15	0	0	27	100
LGM	24	65	6	16	7	19	0	0	37	100
Between LGM & Early Holocene	363	63.5	174	30.4	35	6.1	0	0	572	100
Early Holocene	120	67.4	57	32	0	0	1	0.1	178	100
Post Early Holocene to Mid–Holocene	199	65.9	103	34.1	0	0	0	0	302	100

Raw materials for artefacts of each technological classification can be compared for each time period using evidence from Figure 6.5a–e (also see Appendix Table A1a–e). Overall a consistent pattern from one period to the next is apparent. Changes from before the LGM (Figure 6.5a) and during the LGM (Figure 6.5b) are magnified in appearance due to the low artefact numbers, but the absence of cores before the LGM suggests that knapping occurred off-site. Chert and chalcedony were preferred for complete flakes while no particular changes occurred over time in proportions of broken flakes. The non-local silicified sandstone appears at the start of the early Holocene (Figure 6.5d).

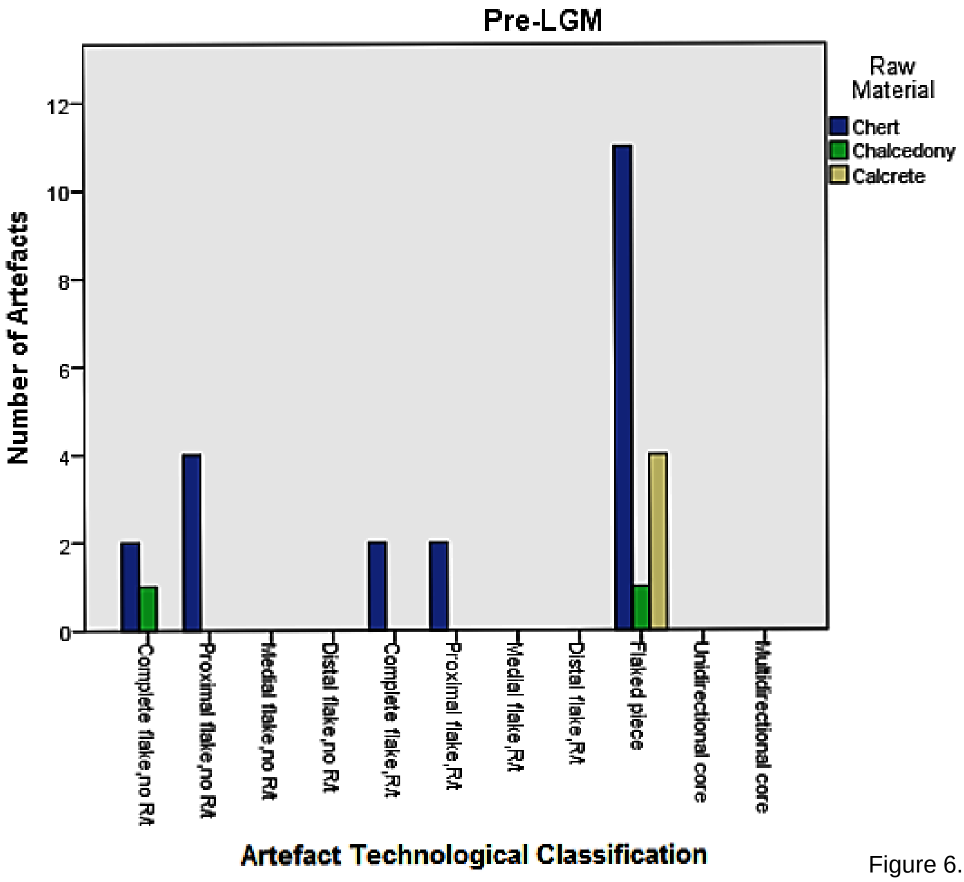


Figure 6.5a

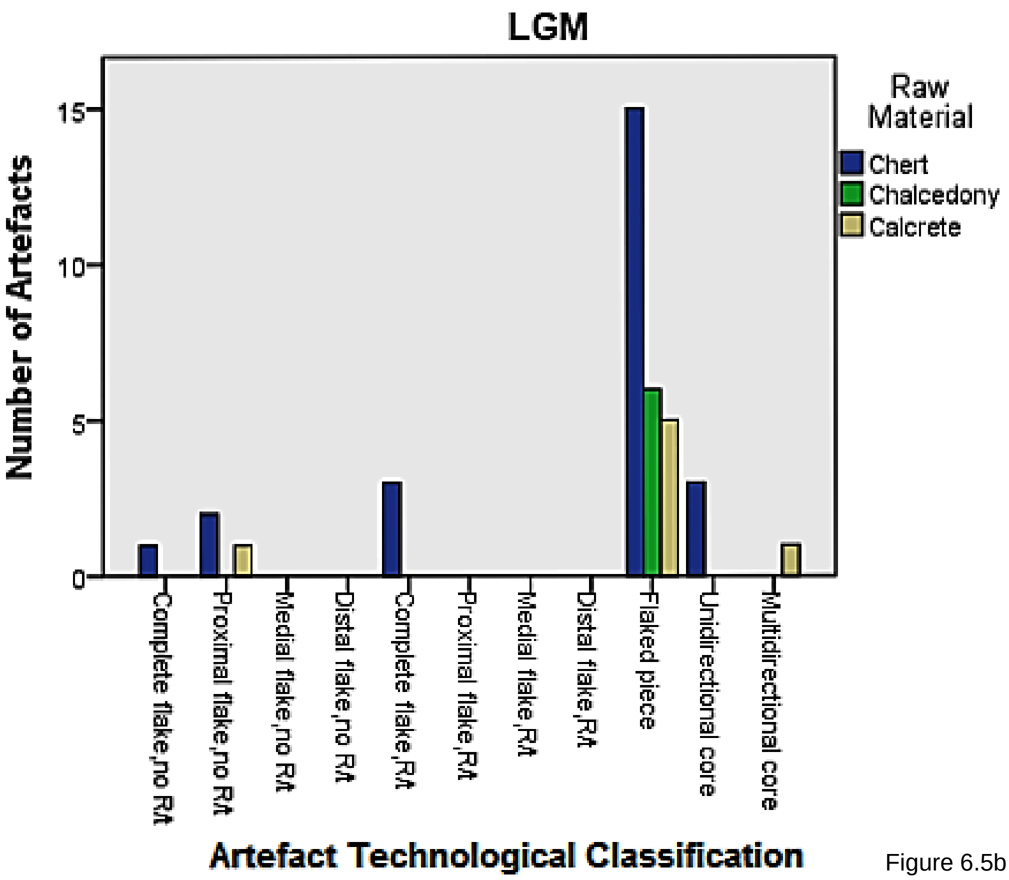


Figure 6.5b

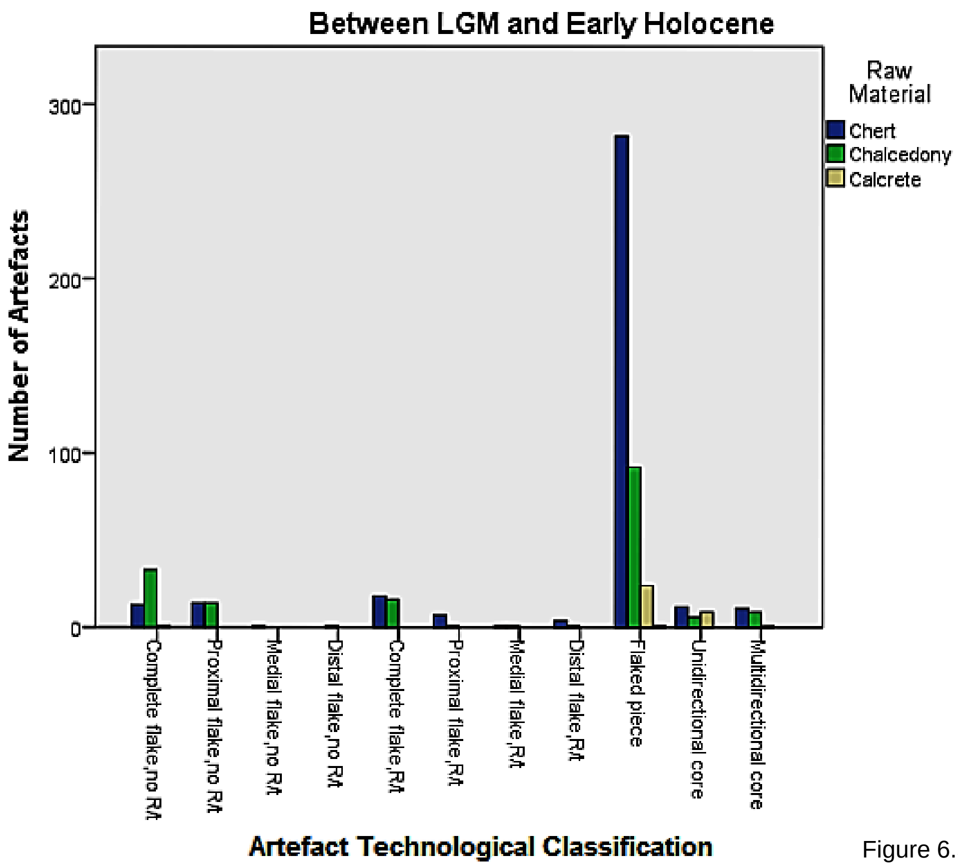


Figure 6.5c

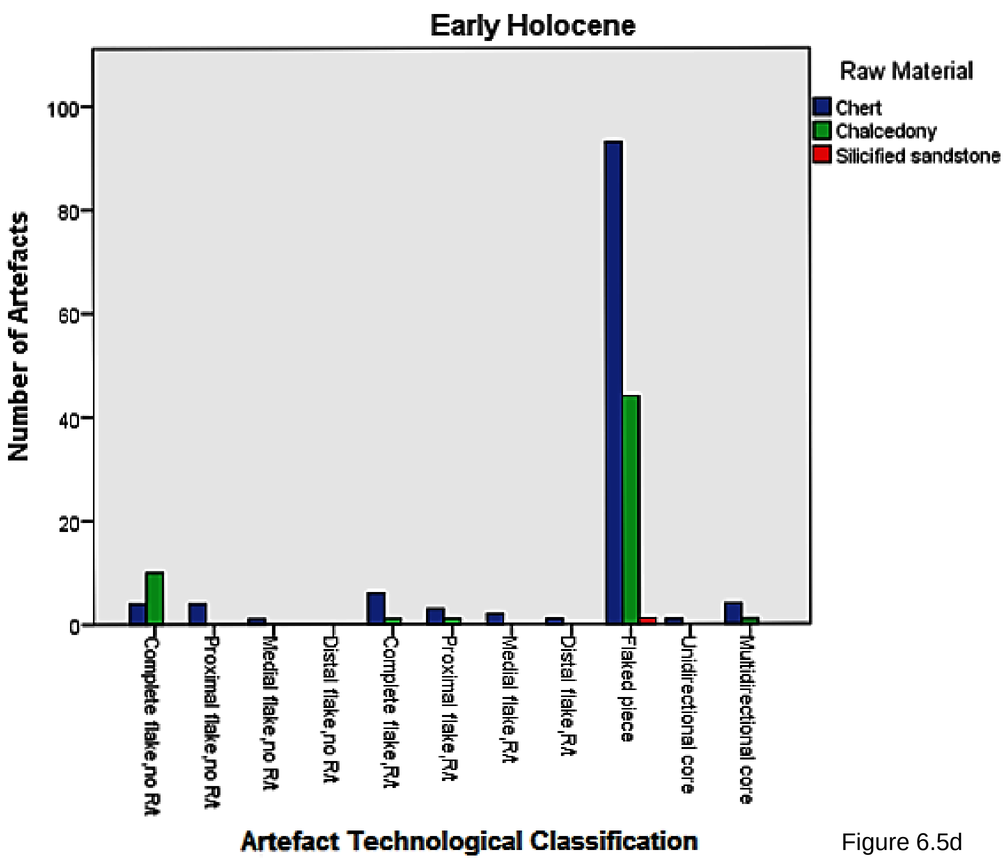


Figure 6.5d

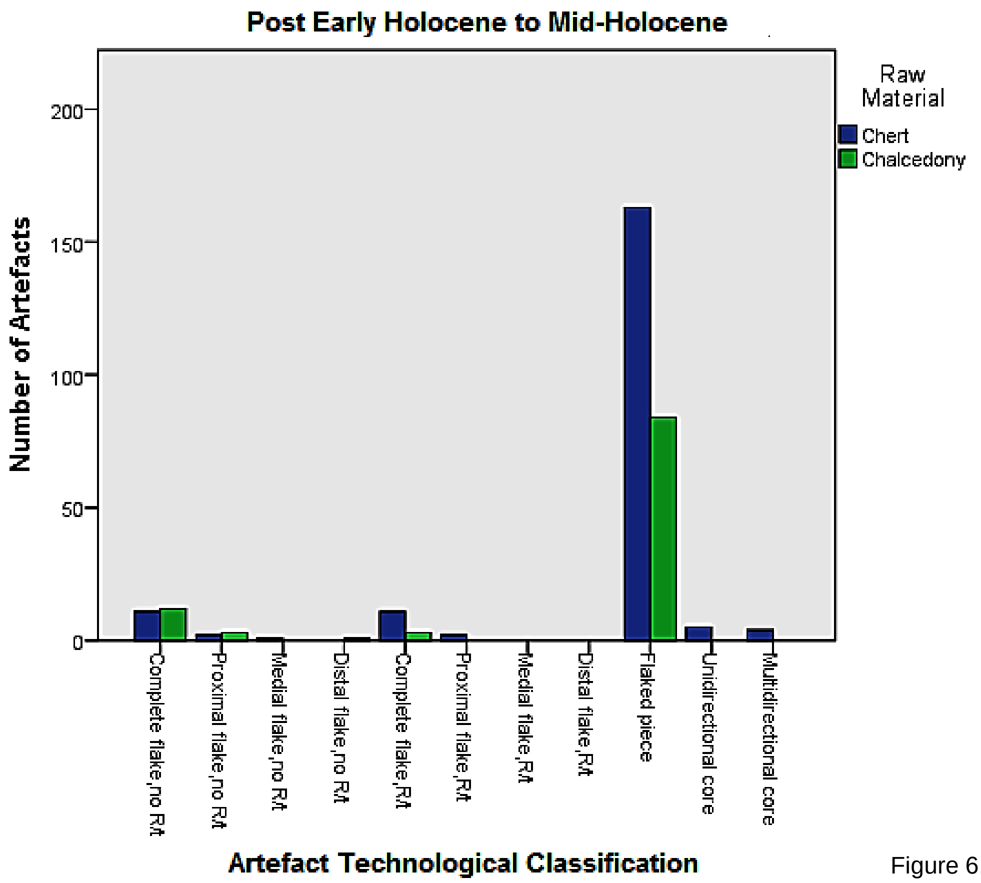


Figure 6.5e

Figure 6-5 Raw materials for technologically classified artefacts.

6.2.3 Flake Dimensions

Figure 6.6 displays the mean length, width and thickness of all flakes for each time period (also see Appendix Table A2). These artefacts are very small, mostly 10 mm–20 mm in length, and include complete and broken flakes (proximal, medial and distal) with and without retouch, and flaked pieces. There is an overall reduction in flake size over the vast period of c. 35,000 years, with one-way ANOVA tests followed by post-hoc Tukey tests revealing statistical significance (indicated by ‘p’ levels below 0.05) for reductions in length, thickness and width, at p=0.000 for each attribute. The statistical significance supports Marun’s (1972) and Cane’s (1995) conclusions that the lithics became smaller over the broad period of human occupation.

However, the changes between chronological periods are not themselves significant. Pre-LGM and LGM mean flake lengths were 21 mm and 20 mm respectively, a change of 1 mm over c. 20,000 years, which an independent samples t-test reveals is statistically insignificant (p=0.63). Pre-LGM and LGM mean flake thickness was almost identical at 4.5 mm and 4.3 mm respectively, the 0.2 mm difference also statistically insignificant (p=0.77). Even the greatest dimensional difference, of 4 mm in flake widths of 17 mm (pre-LGM) and 13 mm (LGM), is statistically insignificant (p=0.81), and no research in lithic analysis indicates that any of these negligible distances are behaviourally significant (e.g. Andrefsky 2008, 2009, 2010; Clarkson 2007; Clarkson and O'Connor 2006; Cotterell and Kamminga 1987; Hiscock 2007; Shafer 2008; Speth 1972). Similar results exist in comparisons from before and during the early Holocene, with mean flake length differing by 0.7 mm, mean width by 1 mm and mean thickness by 0.5 mm. Mean dimensions of cores and of retouched flakes in comparison to unretouched flakes are provided below.

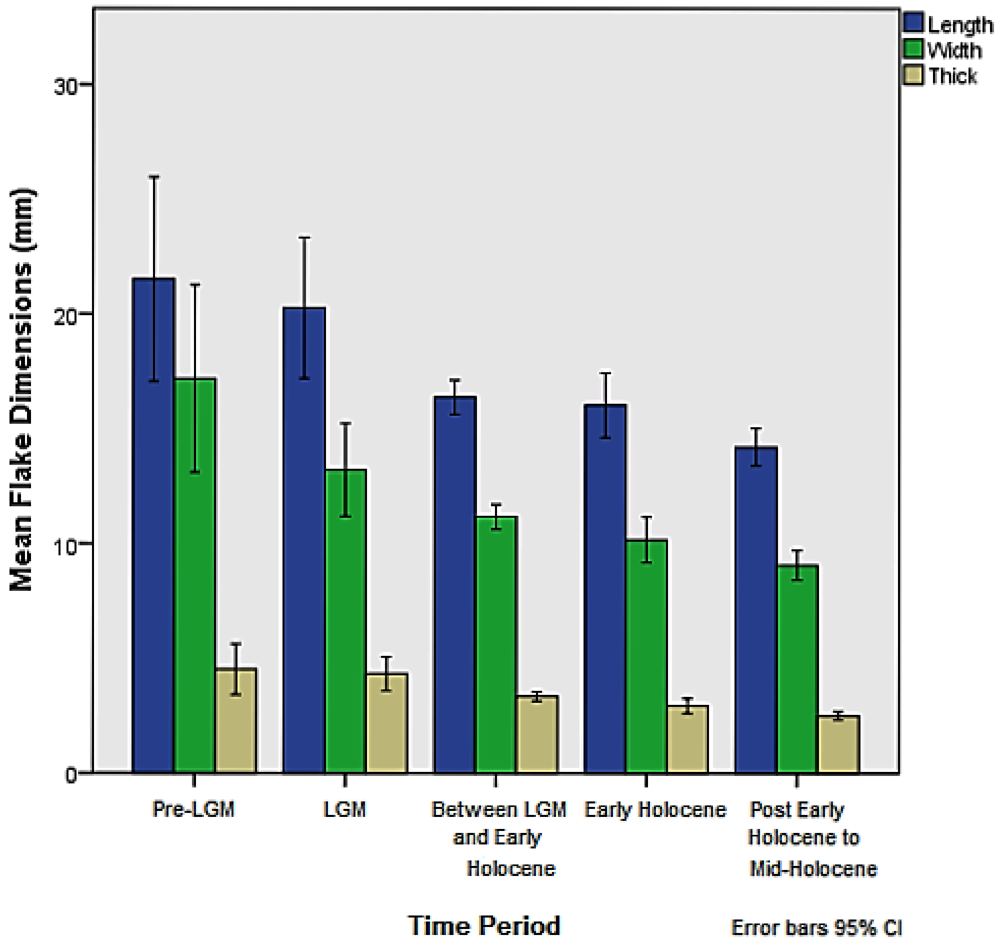


Figure 6-6 Mean flake dimensions.

The median weight of all flakes at Allen's Cave is displayed in Table 6.8. Due to the existence of several (genuine) statistical outliers (Pallant 2007:43, 62) e.g. a flake of 56 grams between the LGM and early Holocene (which was also the longest flake at Allen's Cave, at 68 mm), the median weight is more reflective than the mean. This is further supported by 73% (n=761) of the 1049 flakes in this study weighing less than 1 gram and 12% (n=122) weighing 1 gram. It appears likely that the high percentage of flakes weighing less than 1 gram are 'trimming flakes,' to use Marun's (1972:155–156) term. Heavier flakes would likely be more conducive to most tasks and retouch was reasonably prevalent at Allen's Cave (see below). 'Trimming flakes' resulted from the trimming of artefact edges with step-flakes which were created during the retouch process (Marun 1972:155–156).

Table 6-8 Weight of flakes.

Time Period	Median (g)	Standard Deviation	Minimum (g)	Maximum (g)
Pre–LGM	1	5.61	0.2	21
LGM	1	2.271	0.2	11
Between LGM & Early Holocene	<1	4.064	0.1	56
Early Holocene	<1	2.45	0.1	22
Post Early Holocene to Mid–Holocene	<1	1.798	0.1	21

6.2.4 Platform Attributes

Totals for each platform type are shown in Figure 6.7 (also Appendix Table A3). Of the 203 flakes with platforms, natural platforms were the overriding variety at 137 (68%). When people did prepare platforms prior to flake detachment, the most common method was by flaking. No overhang removal was identified at Allen's Cave, with proximal retouch solely on the ventral surface.

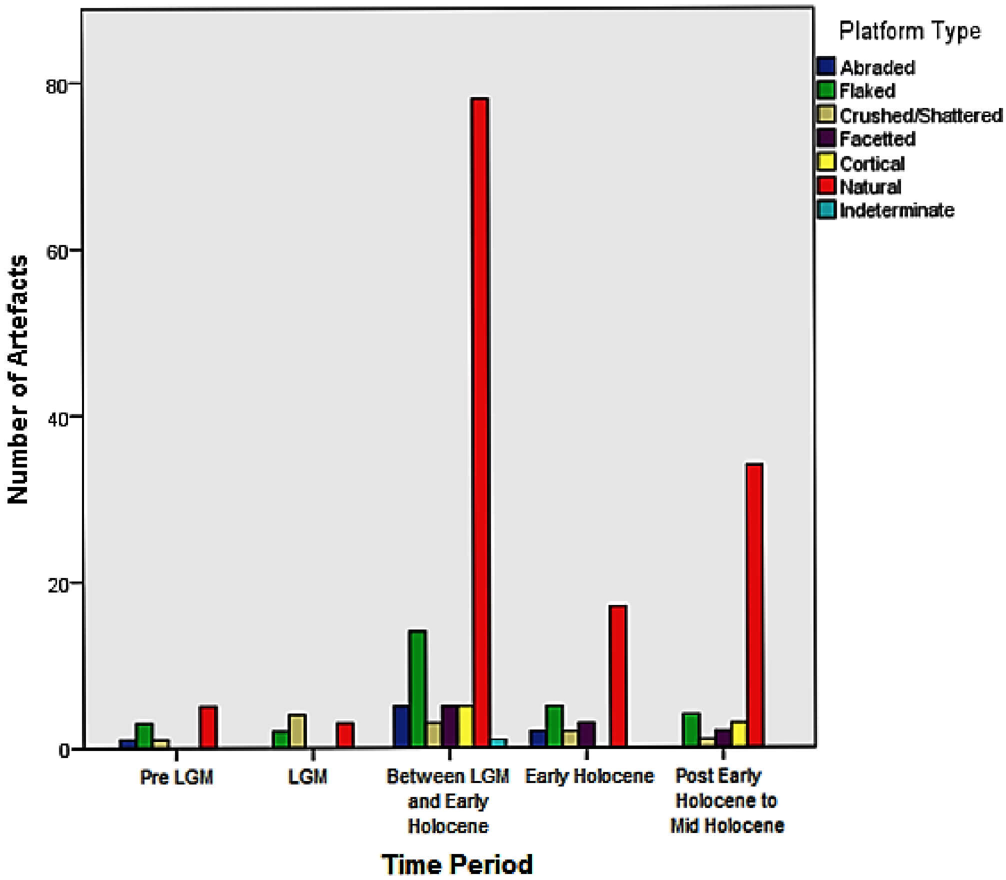


Figure 6-7 Platform types on flakes.

Figure 6.8a–c shows abraded, facetted and cortical platforms from Allen's Cave, which indicate preparation prior to flaking (Table 5.1).

a

b

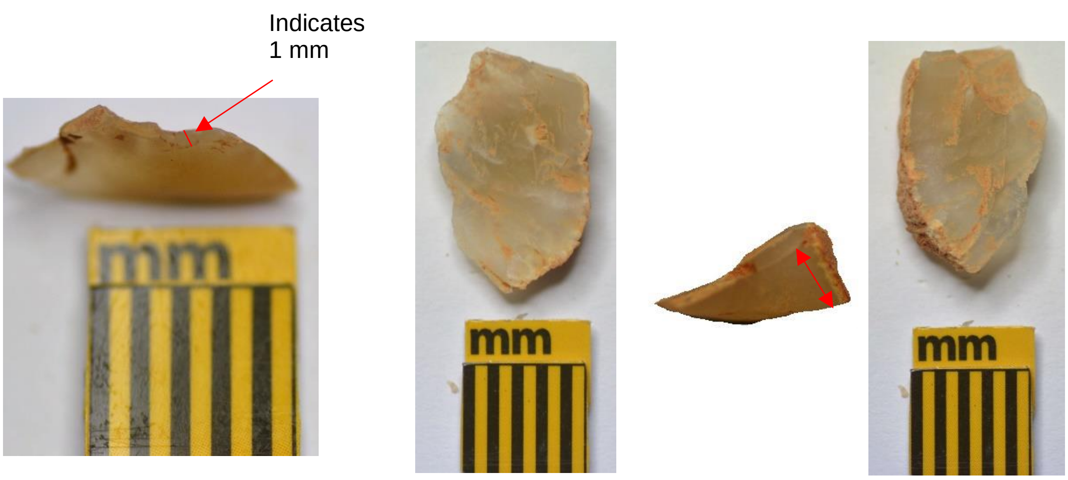
c

Figure 6-8 Platform types, **a:** abraded, E3.22.1; **b:** facetted, E4/29; **c:** cortical, E3.12.3.

Mean platform width and thickness remained consistent across all times (Table 6.9). A one-way ANOVA test followed by a post-hoc Tukey test reveals that over the c. 35,000 years the 1 mm change in mean platform thickness and the 3 mm difference in mean platform width are statistically insignificant: p=1.000 and p=0.545 respectively. Independent samples t-tests also indicate statistical insignificance when comparing individual time periods. Pre-LGM and LGM mean platform thickness was identical (2 mm), while mean width reduced by only 1 mm (p=0.874). ‘Between the LGM and early Holocene’ and early Holocene mean platform thickness was identical (3 mm) and mean width increased by a solitary mm (p=0.547). Figure 6.9 shows platforms of 1 mm and 4 mm thickness.

Table 6-9 Platform thickness and width on flakes.

Time Period	Platform Thickness (mm)				Platform Width (mm)			
	Mean	Std. Deviation	Min.	Max.	Mean	Std. Deviation	Min.	Max.
Pre–LGM	2	0.667	1	3	12	8.643	3	31
LGM	2	1	1	3	11	9.864	2	23
Between LGM and Early Holocene	3	2.257	1	13	9	5.085	2	32
Early Holocene	3	1.974	1	7	10	5.812	2	25
Post Early Holocene to Mid–Holocene	3	2.589	1	11	9	4.72	2	20



a b

Figure 6-9 Platform thickness, **a:** 1 mm, D3.20; **b:** (ventral, plan, dorsal): 4 mm, D3.22.

6.2.5 Flake Terminations

Of the 140 identifiable terminations (Figure 6.10; also Appendix Table A4), feather terminations constituted the overriding majority, numbering 118, with ten step, eight hinge and four plunge terminations. This distribution is unremarkable in the context of most stone artefact assemblages.

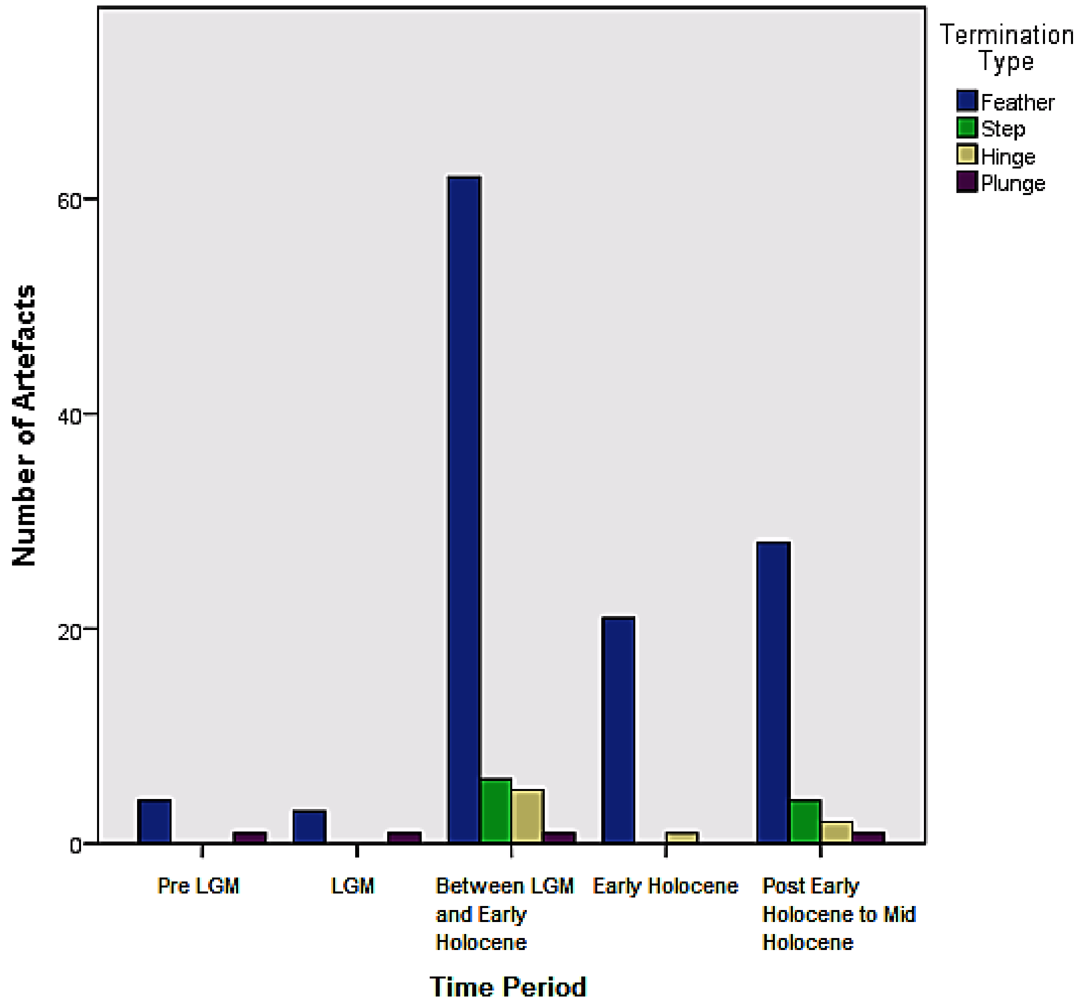


Figure 6-10 Flake termination types.

6.2.6 Retouch on Flakes

Retouch was present on 77 Allen's Cave flakes (Table 6.10). In order to contextualise the relative extent of the occurrence of retouch at Allen's Cave, Table 6.10 shows retouch when considered with and without the inclusion of flaked pieces. The Allen's Cave flaked pieces are so small (generally <10 mm) that their potential for retouch is limited and in any case none was identified. Excluding flaked pieces reveals that retouch was present on just over a third of flakes.

The key point, however, is that on either measure (Table 6.10) the relative presence of retouch remained consistent across time periods. The pre-LGM and LGM periods, that appear to differ slightly in percentage terms from the other time periods, were based on low sample numbers. An independent samples t-test reveals that no statistical significance exists in this difference in the number of retouched flakes (p=0.523). Considerable debate exists regarding whether t-tests or Mann-Whitney U tests are more appropriate for ordinal data (e.g. Winter and Dodou 2010), so a Mann-Whitney U test was also conducted because of its distribution free assumptions. This test further indicated statistical insignificance (p=0.596).

Table 6-10 Percentage of retouch on flakes, calculated with and without flaked pieces.

Time Period	Flaked Pieces Included			Flaked Pieces Excluded		
	Number of Flakes	Number of Retouched Flakes	Percentage of Retouched Flakes	Number of Flakes	Number of Retouched Flakes	Percentage of Retouched Flakes
Pre–LGM	27	3	11.1	11	3	27.3
LGM	33	3	9.1	7	3	42.9
Between LGM and Early Holocene	525	45	8.6	126	45	35.7
Early Holocene	172	11	6.4	33	11	33.3
Post Early Holocene to Mid–Holocene	293	15	5.2	46	15	32.6
Total	1049	77	7.3 (77/1049)	223	77	35 (77/223)

Scalar retouch was the most common type across all periods (Figure 6.11; also Appendix Table A5) and neither dentate nor denticulate retouch was identified. A high level of serration appears to exist between the LGM and early Holocene, but this period is 8000 years while the early Holocene is 3000 years. Any changes in the actual proportion of retouch types are therefore best discerned by comparing percentages. Scalar and serrated retouch between the LGM and early Holocene constitute 55% and 39% of retouch types respectively, while for the early Holocene the corresponding figures are 56%

and 22%. This shows that the rise in serration between the LGM and early Holocene is not as marked when considered in proportion.

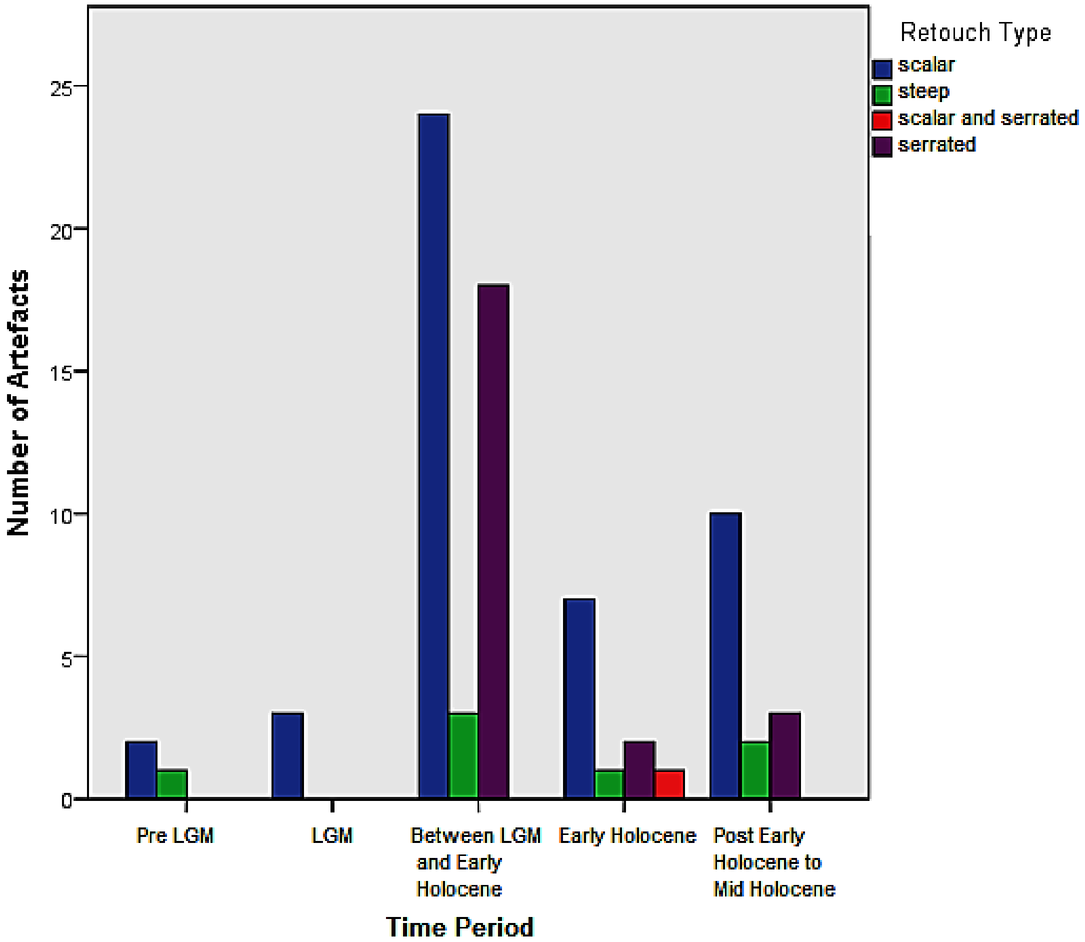


Figure 6-11 Retouch types.

Retouch on flakes normally occurred on slightly more than one margin of each flake (Table 6.11). This occurrence is consistent across time periods regardless of the differences in total numbers of artefacts with retouch. An independent samples t-test showed that the difference in the mean number of retouched margins from before the LGM to the LGM was statistically insignificant (p=0.519), as it was from before the early Holocene to the early Holocene (p=0.587).

Table 6-11 Number of retouched margins on flakes.

Time Period	Mean	Std. Deviation	Minimum	Maximum	Statistical Significance ('p')
Pre–LGM	1.33	0.577	1	2	n/a
LGM	1.67	0.577	1	2	p=0.519
Between LGM and Early Holocene	1.11	0.374	1	3	p=0.534
Early Holocene	1.54	0.66	1	3	p=0.587
Post Early Holocene to Mid–Holocene	1.81	0.75	1	3	p=0.414

When retouch occurred it was minimally invasive, covering a quarter or less of the flake's total surface area (Figure 6.12; also Appendix Table A6).

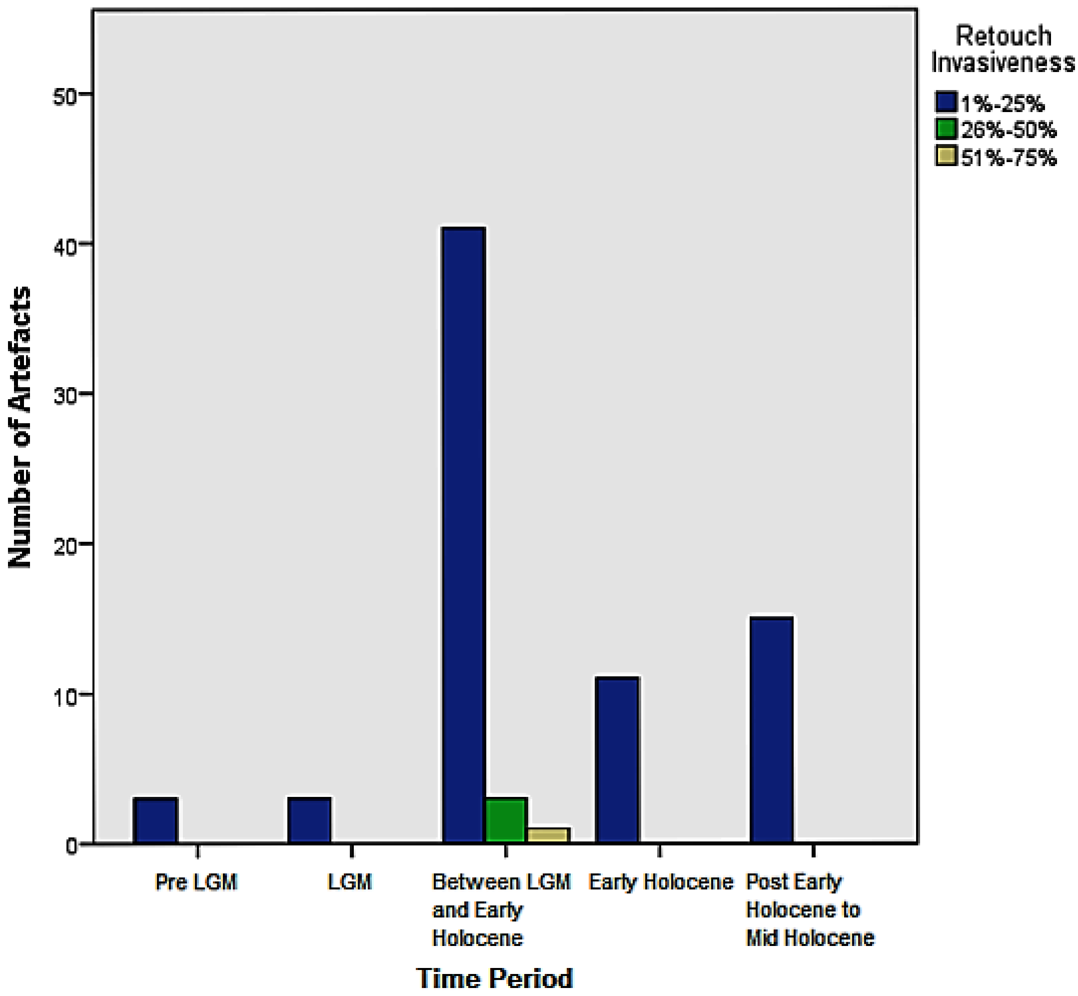


Figure 6-12 Retouch invasiveness.

6.2.7 Cortex on Flakes

Cortex was relatively rare on the analysed stone artefacts at Allen's Cave for each time period, as is apparent in Table 6.12. Cortex was present on 13% (n=104) of flaked pieces, suggesting that at least this percentage of flaked pieces was the result of manufacturing processes as distinct from being the by-products of retouching. Implications of the discard of artefacts retaining cortex are discussed in Chapter 7.

Table 6-12 The presence of cortex on flakes.

Time Period	Present	Absent	% Present
Pre–LGM	4	23	16
LGM	3	30	9
Between LGM and Early Holocene	52	473	10
Early Holocene	33	138	19
Post Early Holocene to Mid–Holocene	68	225	23
Total	160	889	15

When cortex was present on a flake it normally covered less than a quarter of its surface area (Figure 6.13).

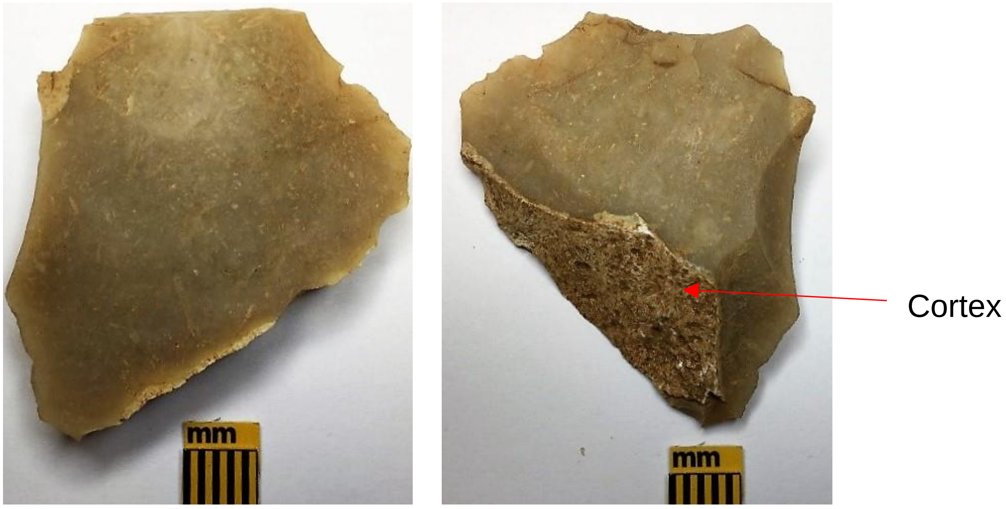


Figure 6-13 Cortex covering less than a quarter of the surface area of a flake, D3/8.

Table 6.13 shows the number of flakes in each period with percentage categories of cortex coverage. Again, the total number of flakes with cortex must be viewed in the context of each time period involving a different number of years—hence the rate of flakes with cortex is shown in Table 6.13. Cortex was present more often following the LGM, although it remained minimally invasive. In conjunction with other artefact attributes, this may suggest a reasonably abundant raw material supply (Table 5.1).

Table 6-13 Extent of cortex, when present, on flakes.

Time Period	No. of Flakes with Cortex Coverage	Rate of Flakes with Cortex (years)	Extent of Cortex Coverage (%)			
			1–25	26–50	51–75	76–100
Pre–LGM	4	1 per 2500	2	2	0	0
LGM	3	1 per 3667	3	0	0	0
Between LGM and Early Holocene	52	1 per 154	33	13	4	1
Early Holocene	33	1 per 91	18	8	5	2
Post Early Holocene to Mid–Holocene	68	1 per 44	40	19	7	2

6.2.8 Core Attributes

Of the 67 cores at Allen's Cave, 63 (94%) derived from after the LGM (Table 6.14). The majority was deposited in the 8000 years between the LGM and early Holocene, but to account for the differences in the number of years in each time period, the mean core discard rate is also provided in Table 6.14.

Table 6-14 Number of cores.

Time Period	Number of Cores	Percent	Cumulative Percent	Mean Core Discard Rate (years)
Pre–LGM	0	0	0	n/a
LGM	4	6	6	1 per 2750
Between LGM and Early Holocene	48	72	78	1 per 167
Early Holocene	6	9	87	1 per 500
Post Early Holocene to Mid–Holocene	9	13	100	1 per 333
Total	67	100	100	1 per 522

Throughout the human occupation at Allen’s Cave approximately half of the cores exhibited unidirectional reduction (54%; n=36) and half multidirectional reduction (46%; n=31) (Figure 6.14; Appendix Table A7; Figure 6.15). Such proportion demonstrates that cores were reasonably often discarded while still retaining some reduction potential. Potential for further reduction is inferred despite the small size of the cores (Figure 6.16), because the Allen’s Cave flakes were similarly small (Figure 6.6)—and the discard of non-exhausted cores suggests that raw materials were reasonably abundant.

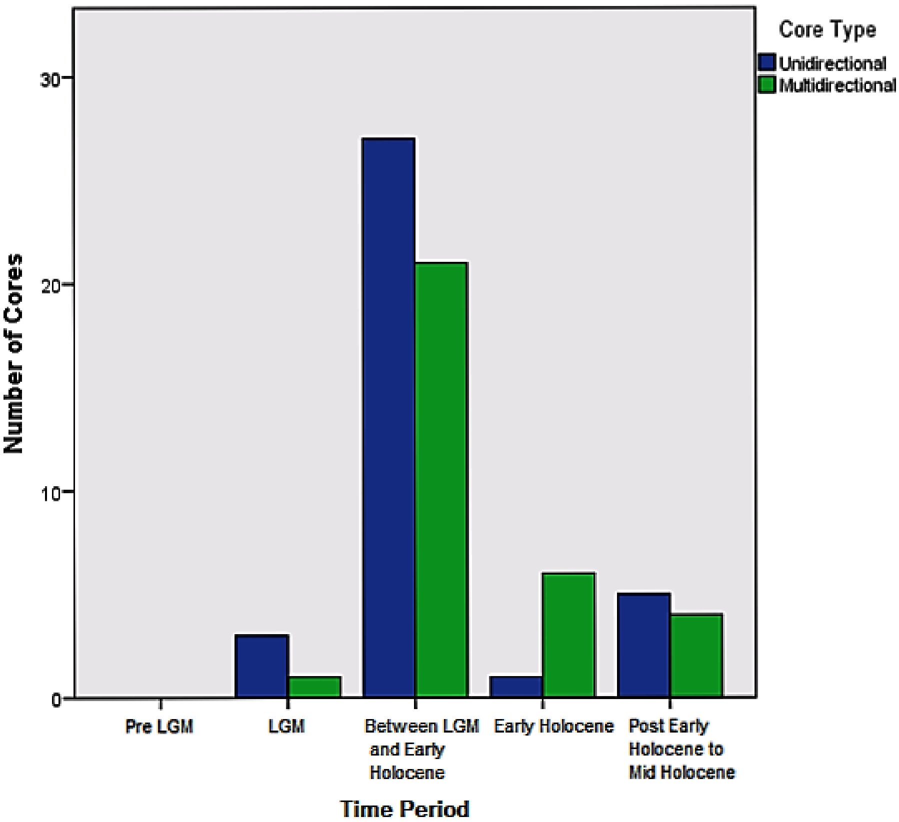


Figure 6-14 Core types.

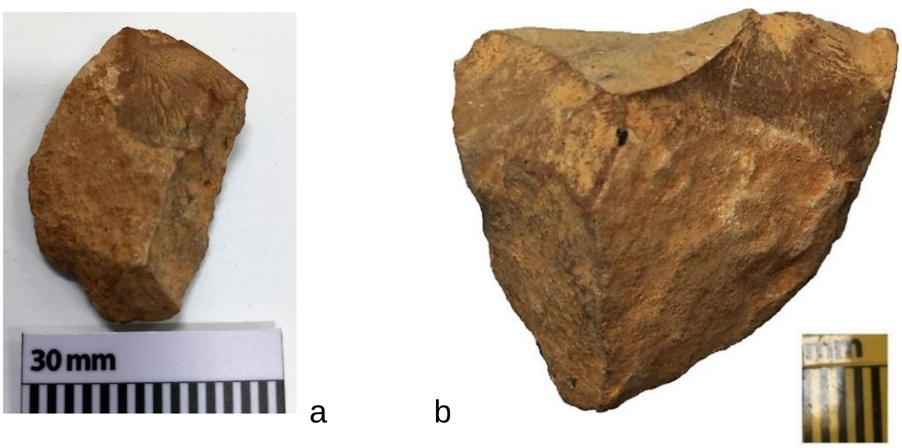


Figure 6-15 Cores, **a:** unidirectional, E4/37; **b:** multidirectional, E4/24.

Mean core length, width and thickness remained similarly proportionate to each other over each time period, with little change, as reflected in Figure 6.16 (and Appendix Table A8). The apparent length increase in the ‘post early Holocene to mid-Holocene’ period is relatively inconsequential in reality, with the graph magnifying the increase because of a small sample number that differed by only two cores (n=7 cores in the early Holocene and 9 cores in the ‘post early Holocene to mid-Holocene’). An independent samples t-test in relation to the length increase revealed no statistical significance (p=0.218). Nor did statistical significance exist in the slight reduction in mean core length from ‘between the LGM and mid-Holocene’ to the early Holocene (p=0.414). No relationship can be extrapolated to exist between the increase in the percentage of cortex on flakes in the early Holocene (Table 6.12) and these core dimensions (Figure 6.16; Appendix Table A8) because there was effectively no change in core dimensions. Similarly, there was virtually no change in the proportion of raw material to infer a relationship between changes in cortex extent, core dimensions and raw materials.

The greatest mean core length was 40 mm (‘post early Holocene’; Figure 6.16). This consistency in size with the similarly small mean flake dimensions (Figure 6.6) likely reduces the possibility that larger flakes were deposited elsewhere. Such a possibility cannot be precluded because depending on intra-site artefact discard locations larger cores and flakes, hitherto unexcavated, may have been used in other parts of Allen’s Cave.

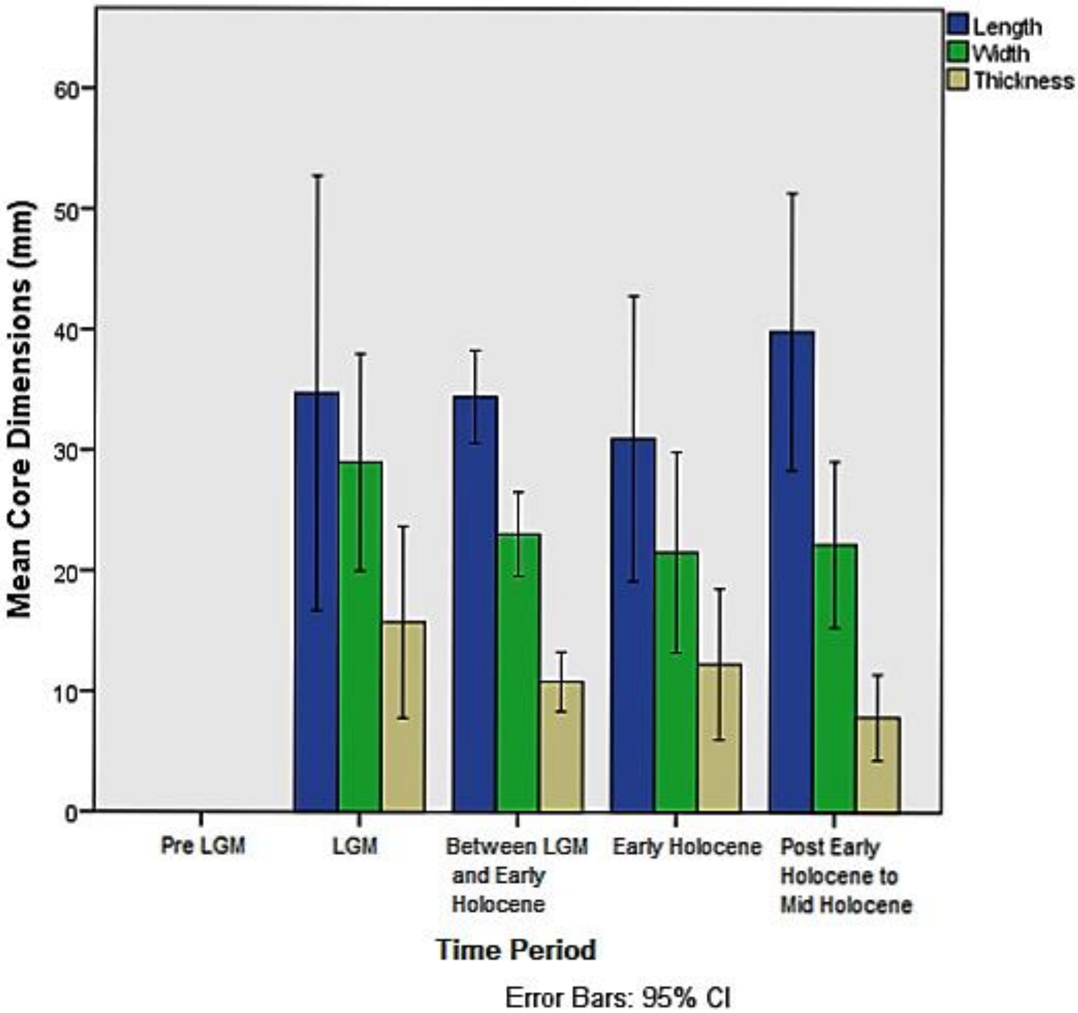


Figure 6-16 Mean core dimensions.

Numbers of platforms and negative flake scars on a core are indicative of the amount that each core was reduced in order to manufacture flakes (Clarkson 2007:31–34), with details displayed in Table 6.15. People during the early Holocene reduced their cores by around 1½ more flakes (4.61 negative flake scars compared to 3.04) than did their predecessors, but an independent samples t-test indicates that this is statistically insignificant (p=0.159). Early Holocene Allen's Cave inhabitants also deposited more multidirectional cores in relation to unidirectional ones (Figure 6.14; Appendix Table A7) and the mean number of platforms on cores (Table 6.15) increased by only one, bordering on statistical significance (independent samples t-test, p=0.05). During this period, however, people deposited cores less frequently than their antecedents (1 per 500 years compared to 1 per 167 years; Table 6.14). These somewhat mixed results in combination mean that during the early

Holocene the inhabitants of the rockshelter exhausted a lesser number of cores slightly more but not to a significant extent.

Table 6-15 Number of platforms and negative flake scars on cores.

Time Period	No. of Cores	No. of Cores with 1–5 Platforms ('P/f')					Mean No. of Platforms	Standard Deviation	Mean No. of Negative Flake Scars	Standard Deviation
		1 P/f	2 P/f	3 P/f	4 P/f	5 P/f				
Pre–LGM	–	–	–	–	–	–	–	–	–	–
LGM	4	2	–	2	–	–	2	1.155	2.3	1.500
Between LGM and Early Holocene	48	16	20	9	3	–	2	1.110	3.04	2.689
Early Holocene	6	–	1	3	1	1	3.5	0.787	4.61	1.996
Post Early Holocene to Mid–Holocene	9	3	2	3	1	–	2	1.965	2.2	1.093

Median weights of cores are shown in Table 6.16, rather than mean weights because this is more demonstrative of typical core weight given the (genuine) statistical outliers (Pallant 2007:43, 62). One core, for example, weighing 188 g between the LGM and early Holocene (seen alongside a core of typical weight, 17 g, in Figure 6.17), would otherwise skew the data in regard to these measures (e.g. the standard deviation is heavily influenced by this 188 g core; Table 6.16). The small number of LGM cores (n=4) also magnifies the apparent pecentage difference. The large 188 g calcrete core was not heavily reduced, exhibiting only two platforms and two negative flake scars, although this is unsurprising given the relatively poor flaking quality of calcrete compared to the more abundant and high quality chert and chalcedony.

The light weights of cores as indicated in Table 6.16 is consistent with their other small dimensions (Figure 6.16; Appendix Table A8) and with the small sizes of the Allen's Cave flakes (Figure 6.6; Appendix Table A2). This suggests that much of the weight of cores was likely dispersed as flaked pieces or as flakes that are no longer there (the cores may also be small because seams of chert and chalcedony are narrow). It may be inferred from this that a considerable proportion of the flaked pieces derived from artefact manufacture rather than from breakage during the use of flakes.

Table 6-16 Median weight of cores.

Time Period	Median Weight (g)	Standard Deviation	Minimum (g)	Maximum (g)
Pre–LGM	–	–	–	–
LGM	16.5	10.626	9	31
Between LGM and Early Holocene	6.5	33.774	0	188
Early Holocene	12	9.118	0	22
Post Early Holocene to Mid–Holocene	6	9.981	0	33

Figure 6-17 A 17 g and a 188 g core.

As is apparent from Figure 6.18 (also Appendix Table A9), no cores were covered with more than 50% of cortex. As was the case with cortex on flakes, the vast majority of 70.6% (n=48) had no cortex whilst 26.5% (n=18) of cores had a cortex covering of a quarter or less of their surface area.

Table 6.17 shows the distribution of cortex on cores per raw material. These results are unremarkable but consistent with the general proportion of raw material use at Allen's Cave, which was around two-thirds chert and one-third chalcedony (Table 6.7). This proportion is reflected in the overall total in Table 6.17, where chert accounted for 13 of the 21 cores exhibiting cortex and chalcedony six of the 21.

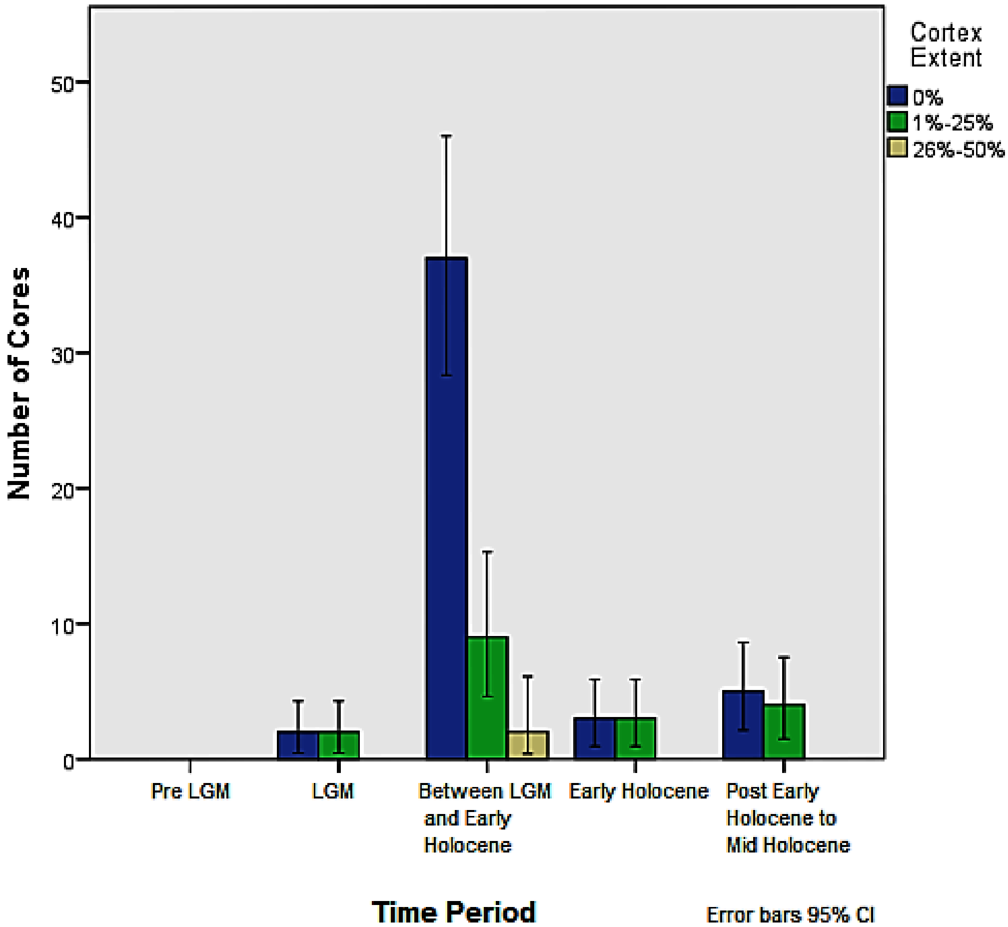


Figure 6-18 The extent of cortex coverage on cores.

Table 6-17 The number of cores exhibiting cortex, for each raw material per time period.

Time Period	Chert	Chalcedony	Calcrete	Total No. of Cores with Cortex/Total No. of Cores
Pre–LGM	–	–	–	–
LGM	2	–	–	2/4
Between LGM and Early Holocene	5	5	2	12/48
Early Holocene	2	1	–	3/6
Post Early Holocene to Mid–Holocene	4	–	–	4/9
Total	13	6	2	21/67

6.3 Chapter Summary

From this analysis there emerges a clear trend of stone technological continuity from c. 40,000–5000 BP. Allen's Cave lithics are particularly small, with flakes typically 10 mm–20mm in length and cores mostly < 40 mm in length. Flaked pieces constitute approximately three quarters of the analysed assemblage and local chert and chalcedony were used for around two-thirds and one-third of lithics respectively. The key results were that lithics were present for the majority of the LGM but did not differ in any significant way from the previous stone technology, and early Holocene stone artefacts were predominantly technologically consistent with the preceding period (c. 19,000–11,000 BP), but contained subtle evidence of behavioural change (discussed in Chapter 7). Such results can add to related findings by Marun (1972) and Cane (1995), while having considerable implications for the environment as a catalyst for behavioural change and for the arid zone settlement models of Veth (1989) and Hiscock and Wallis (2005).

Chapter 7: Discussion

The primary research question of this study asks how Aboriginal people at Allen's Cave responded via their stone technology to the hyper-aridity of the LGM and, conversely, to the locally improved conditions of the early Holocene. Additional questions concern how the lithic evidence may contribute to the LGM arid zone settlement models of Veth (1989) and Hiscock and Wallis (2005), and how comparisons of results and interpretations with those of previous analysts Marun (1972) and Cane (1995) may advance our understandings. To answer these questions the local palaeoenvironment was synthesised, establishing the existence and temporality of the climatically contrasting periods, and replicable, contemporary technological methods of lithic analysis were employed.

7.1 Evidence for Human Occupation at Allen's Cave

On the basis of the refined duration of the LGM (Fitzsimmons et al. 2013:90–91; Lambeck et al. 2014; Chapter 3 [3.4]) and on correlations of previous dates for Allen's Cave, evidence for human occupation at Allen's Cave during the LGM was reassessed. No lithics or other artefacts were identified in the spits representing the first 4000 years of the LGM (Table 6.6), and it is therefore concluded that Aboriginal people were likely not present at the rockshelter during this time (c. 30,000–26,000 BP). Lithics were, however, excavated from all subsequent spits up to the near present, demonstrating persistent human visitation for the majority of the LGM (26,000–19,000 BP; Table 6.6) and continually thereafter.

7.2 Lithic Responses to the LGM at Allen's Cave

Results from this analysis demonstrate that people around Allen's Cave during the LGM used the same form of stone technology as their predecessors. Retouch, when excluding flaked pieces, occurred on three of the 11 flakes (27%) before the LGM and on three of the seven flakes (43%) during the LGM

(Tables 6.4 and 6.10). The low sample number magnifies the difference but behaviourally no discernible technological change could be inferred from this, given that each time period was around 10,000 years—and no statistical significance exists in the difference (Chapter 6 [6.2.6]). Similarly, at Puritjarra, one of the few other desert sites visited consistently during the LGM (Hiscock 2008:46–49; Smith 1989, 2006:374–379), only two pre-LGM lithics and four LGM stone artefacts displayed retouch (Smith 2006:377).

Percentages of retouch at Allen's Cave were consistent throughout human occupation, amounting to around one third of flakes when excluding flaked pieces (Table 6.10). Although edge flaking can be the result of artefact use rather than intentional manufacture and any piece of stone could potentially be used, retouch is often indicative of deliberate tool-making (Clarkson and O'Connor 2006:191–192; Hiscock 2007:201). A future use-wear study could further inform us about these issues. The key point for the purposes of this study, however, is that retouch remained constant regardless of environmental fluctuations.

Stone technological continuity during the LGM was also evident in other retouch attributes. The mean numbers of retouched margins on the three pre-LGM flakes and three LGM flakes was consistent, at 1.33 and 1.67 respectively, with no statistical significance in the difference (Table 6.11). The absence of notching retouch throughout the human occupation of Allen's Cave suggests that this hafting method may not have been important as a responsive strategy to the LGM (or during other times). However, Hayden's (1977:180–185) ethnographic observations of Western Desert people indicated that other varieties of lithics such as scrapers, denticulates and burins may have been hafted, as may the backed artefacts identified by Marun (1972) and Cane (1995).

Some hafting may therefore have occurred at Allen's Cave. No denticulates, burins or backed artefacts, however, were identified in the present analysis. A similar lack of evidence for hafting occurs at Koonalda, Djadjiling and Puritjarra (Gallus 1968; Law 2010; Smith 2008; Wright 1971a). This is in contrast to much of Australia during the heightened aridity of the mid-Holocene, when people practised hafting due to the advantage this created by increasing the portability and durability of lithics (Hiscock 1994, 2002).

The absence of clear, positive evidence for hafting at Allen's Cave demonstrates that hand-held tools were probably sufficient for a variety of purposes. It cannot be precluded, however, that some hafted lithics were discarded elsewhere. The likelihood that hafting was relatively infrequent further suggests that people discarded most of their flakes on-site while taking cores with them for subsequent off-site knapping. The probable rarity of hafting suggests that people preferred to produce new lithics rather than seeking to prolong the use-life of existing ones. Such a preference further attests to a reasonably abundant source of useful raw materials that would have minimised the need to travel great distances or to trade or exchange in order to procure them. Detailed knowledge of the local environment may have eliminated risk as a factor encouraging the practising of hafting.

Several retouch attributes remained consistent at Allen's Cave not only during the LGM in comparison to beforehand but over c. 40,000–5000 BP. When present on flakes during these 35,000 years, retouch typically occurred on approximately 1½ margins (Table 6.11). Retouch was minimally invasive before and during the LGM, present on only a quarter or less of the surface area of each retouched flake (Figure 6.12). Minimally invasive retouch continued to be applied on almost all occasions after the LGM (Figure 6.12), suggesting that when people modified flakes to produce tools, their priority was the working edge rather than overall artefact morphology. Emphasis on the working edge also occurred, for example, at Koonalda (Wright 1971a:50–52), and corroborates Hayden's (1977), Cane's (1992) and Wright's (1967) ethnographic observations.

At Allen's Cave a slight general reduction occurred in flake size over the analysed time periods (Figure 6.6), although not during the early Holocene compared to the previous period. Evidence does not, however, support retouch frequency increasing as artefacts became smaller (Tables 6.10 and

6.11 in combination). This new finding therefore contrasts with one of Marun’s (1972:332) conclusions and highlights the benefits of reanalysis.

Retouch applied for the manufacture of backed artefacts may, however, represent an exception to the overall pattern of continuity. Marun’s (1972:250) oldest excavated backed artefact may date between c. 15,000 BP and 12,000 BP, which supports other Pleistocene finds (e.g. Attenbrow et al. 2009:2766; Hiscock 2014:124; Hiscock et al. 2011:656; Robertson et al. 2009:296; Slack et al. 2004:131–132, 134–136) in dispelling earlier arguments reliant upon backed artefacts first appearing in the mid-Holocene (e.g. Bowdler and O’Connor 1991:54–57; Flood 2010:228–236; Stockton 1977:51; Chapter 4 [4.1.6]). No backed artefacts observed by Marun (1972) could be analysed, however, because they are most likely among the now unprovenanced lithics (Dr Keryn Walshe 2015, pers. comm.). Cane (1995:28) observed two backed artefacts, c. 4000 BP, without describing which exact lithics these were, but none were identified in the present study. It is possible that Cane (1995) used different criteria for identification or that both backed artefacts are missing from the assemblage.

Other aspects of the Allen’s Cave lithics add to the evidence for technological continuity during the LGM. Cores, discussed further below, were present for the first time in the LGM but totalled only four over the 11,000 year period. Raw materials were used in the same broad proportions as beforehand, given that percentage changes are again magnified by the small sample numbers, with chert accounting for around two thirds of all lithics (Table 6.7). Stone artefacts excavated at other arid zone sites, such as Puritjarra (Smith 2006:379, 385, 387, 399, 405) and Koonalda (Wright 1971a), demonstrate a similar level of consistency of attributes and overall morphology on all raw materials. The homogeneity of the Allen’s Cave lithics thus appears reasonably typical of desert LGM inhabitants.

Based on a consideration of the raw materials it could be argued that inhabitants of Allen’s Cave limited their foraging ranges during the LGM, but that this was a continuation of previously existing behaviour. It cannot be precluded that foraging ranges were in fact extended without resulting in archaeological visibility, but Table 6.7 demonstrates that during the LGM only local raw materials were used, i.e. chert, chalcedony and calcrete (Dr Alan Watchman 2015, pers. comm.; also based on formation processes described in Cetin et al. 2013:76, 79; Luedtke 1992; Rapp 2009:78, 80; Webb et al. 2013:131). Gould and Saggers' (1985) comparisons of technological characteristics of raw materials used ethnographically in the Western and Central Deserts supports the value of raw material sources for indicating foraging range and trade/exchange. Their research demonstrated that raw material procurement frequently occurred incidentally during travel conducted for other reasons, such as establishing and maintaining social networks, and, in contrast to Binford (1979), that the quality of stone for utilitarian purposes was an important consideration for foragers. At Allen's Cave during the LGM the use of only local raw materials, indicative of an absence of trade/exchange, is understandable given that chert and chalcedony in particular are of high flaking quality (Kamminga 1982:24–25; Luedtke 1992:75–83; Rapp 2009:76). Pre-LGM Allen's Cave inhabitants, however, also exclusively utilised local raw materials (Table 6.7), so no behavioural change occurred in this respect.

Like Allen's Cave, other arid sites during the LGM have evidence for the potential restriction of foraging ranges. At Puritjarra, for example, 76% of all LGM lithics were manufactured from local stone, which was more than at any other time (Smith 2006:380, 405). The remaining 24% of non-local material indicates the continuation of travel and/or exchange/trade, but Puritjarra inhabitants ceased the regular practice of the previous several millennia of sourcing preferred ochre from 125 km away, relying instead on nearby varieties (Hiscock 2008:61; Smith et al. 1998). Local raw materials were relied upon at desert sites such as Milly's Cave in the Pilbara, which was occupied intermittently during the LGM (Marwick 2002:24–31; Slack et al. 2009:32–33; Table 2.1), as well as at Koonalda Cave (Wright 1971a:48–56) and Queensland's Fern Cave (Lamb 1996:3–5). These examples are consistent with arguments that the restriction of foraging range was a reasonably common risk minimisation strategy (e.g. Hiscock 2008:60–61; Smith 1989; Torrence 1989a and b).

The low quantity (n=37) of lithics excavated for the LGM suggests that Allen's Cave was most likely visited sporadically by small numbers of people, despite desert artefact numbers at most times being typically relatively low in comparison to non-arid sites (Smith 2013:107, 136–138). Some researchers have argued that artefact numbers reflect population sizes and changes (e.g. Hughes and Lampert 1982; Lampert and Hughes 1974). Such an argument is overly simplistic because fluctuations in artefact numbers could be the result of changes in non-demographic factors, such as inter-group interactivity, e.g. trade/exchange/ceremonies (Lourandos 1983:82, 92; 1985:391, 400), adjustments in manufacturing techniques (Clarkson 2007:130–134; Ross 1984:200; 1985:83), taphonomic processes (Clarkson 2007:130–134), variations in economic and landscape use patterns (Lourandos 1985:411) and intra-site artefact discard locations (Attenbrow 2004:29). To be indicative of population sizes, stone artefact numbers must therefore be complemented by other forms of archaeological evidence, such as faunal remains, hearths and human-induced sediment deposition (Attenbrow 2004:15; Barker 1991:105–107; Clarkson 2007:134; David and Chant 1995:214; Hiscock 1981; Mulvaney and Kamminga 1999:272; Smith 2006:402).

Such complementary archaeological evidence hitherto excavated at Allen's Cave supports the lithic indications for visits by small numbers during the LGM. According to the contents of spits described by Walshe (1994:251–257, 261), no faunal remains were deposited by humans during this period. Ratios do not reflect any increase in anthropogenic sediment deposition (Cane 1995:39; Chapter 4 [4.3.1]) and the only other archaeological material excavated for the entire LGM is a solitary hearth, dated by OSL to 22,000 ± 2000 BP (Cane 1995:14, 24). Artefact quantities were not influenced by trade/exchange because this most likely did not occur, while continuity evident in the lithic technology suggests that manufacturing techniques did not change.

Similar proportions of lithics and other archaeological evidence suggest that, like Allen's Cave, infrequent but continual visits appear to have been made to other arid zone rockshelters during the LGM (e.g. Table 2.1). Extrapolations from layers approximately representative of the LGM at the Djadjiling rockshelter (dated samples do not correspond exactly with the dates for the LGM of 30,000–19,000 BP; Law et al. 2010) reveal that less than 10% of the stone artefacts excavated were deposited during this period, with no greater proportion of any other archaeological evidence (Law et al. 2010:68). At Juukan 1 and Juukan 2 at Brockman in the Pilbara's Hamersley Ranges, Slack et al. (2009) excavated lithics in all LGM layers, but in what appears to be low quantities. Slack et al. (2009) were not explicit about the numbers of LGM lithics, but only 304 stone artefacts were excavated for the entire period from 32,950 ± 270 BP to the Holocene and they described artefacts in the 'lower' spits as being present only 'individually' rather than in multiples. These quantities formed the basis for Slack et al.'s (2009:34–35, 38) interpretation that the rockshelter was occupied persistently but infrequently during the LGM.

Evidence from cores at Allen's Cave further supports the likelihood that visits to the rockshelter were as infrequent during the LGM as they had been previously. On the basis of the assemblages from the two Allen's Cave excavations (Cane 1995; Marun 1972), stone cores were deposited for the first time during the LGM. Their total number, however, was only four over this 11,000 years (Table 6.14), which does not indicate a major shift in the use of the landscape. It is likely that Allen's Cave inhabitants took cores with them after visiting the rockshelter, as indicated, for example, by the presence of chalcedony flakes/flaked pieces before and during the LGM, yet an absence of chalcedony cores during both periods (Figure 6.5a and b). Further cores, hitherto unexcavated, may of course exist in other locations within the rockshelter. Such a possibility could, however, equally apply to other artefacts, and similar core curation seems to have occurred during the LGM at Puritjarra, where only two cores were excavated (Law et al. 2010), and at Djadjiling, where no cores were observed (Smith 2006:377).

The nature of the four LGM Allen’s Cave cores suggests that raw materials were readily available. Each core was made from local raw material (three of chert and one of calcrete; Figure 6.5b) and, as at Puritjarra (Smith 2006:385, 387, 399), still retained potential for further working upon discard—albeit not extensive due to the small sizes of the cores (Figure 6.16). Such reduction potential is demonstrated by three of the four cores being unidirectional, with no core rotation to utilise additional platforms (Clarkson 2007:32–34). Further, the mean number of platforms for the four cores was only two, while the median number of negative flake scars was only 2.3 (Table 6.15). The mean dimensions of the four LGM cores were equal to or greater than the overall Allen’s Cave mean, albeit by minor extents (+ 6 mm width, + 4 mm thickness, + 2 g weight, equal in length), but this shows that no reduction in size existed to discount the other indications of the existence of further reduction potential.

Such core reduction continued in a virtually identical manner following the LGM, with the mean number of platforms and negative flake scars in the deglacial period at 2 and 3.04 respectively. These characteristics suggest that the cores did not need to be reduced to the point of exhaustion because raw materials were reasonably abundant (see Clarkson 2007:32–35, 37, 134; Clarkson and O’Connor 2006:170; Holdaway and Stern 2004:188; Table 5.1). Similar indications exist at Fern’s Cave during the LGM, where Lamb (1996:5) found that local chert was also regularly discarded at stages where potential existed for further reduction.

An analysis of flake dimensions (Figure 6.6; Table A2) further demonstrates continuity in the stone technology from before and during the LGM. No stone artefact studies have indicated that such minimal differences (1 mm in length, 0.2 mm in thickness and 4 mm in width; Figure 6.6; Table A2) reflect technological behavioural change (e.g. Andrefsky 2008, 2010; Clarkson 2007; Clarkson and O’Connor 2006; Cotterell and Kamminga 1987; Hiscock 2007; Shafer 2008). These minute changes were also statistically insignificant (Chapter 6 [6.2.3]). Such technological continuity means that pre-LGM and LGM flake dimensions cannot constitute even ‘minor changes’ under the Hiscock and Wallis (2005) settlement model. The continuity is similar to

Puritjarra, Djadjiling (Law et al. 2010) and Koonalda (Wright 1971a), where flakes were manufactured in broadly the same manner throughout human occupation (Smith 2006:383–385).

The fact that Aboriginal people had the skills to occupy the landscape around Allen's Cave during the LGM, using stone technology consistent with that employed by their predecessors, demonstrates that the hyper-aridity of this period was not a catalyst for technological change. It may be inferred from this that people's lithics were sufficiently multifunctional to be suitable for all kinds of environmental conditions—this could be further examined by a future use-wear and residue analysis. The consistent stone technology suggests that Allen's Cave inhabitants did not need to develop a niche economy that required a reliance on specialised stone artefact forms during the changing climatic conditions (in contrast to the mid-Holocene, e.g. Hiscock 1994, 2002).

Stone technology at Allen's Cave did not, for example, need to be manufactured to cater for any change in faunal exploitation. According to Walshe's (1994:257) faunal analysis, the reliance on small game supplemented by occasional large prey existed throughout human occupation. The large prey was killed off-site and brought back to the rockshelter, possibility indicating that men, women and children visited Allen's Cave (Walshe 1994:257, 260). Women may, in fact, have acquired the majority of provisions. Recent ethnographic and archaeological evidence exists for women hunting small prey, including from other regions such as among the Khanty and Chipewyan polar societies (Jarvenpa and Brumbach 2006:289–298) and in Upper Palaeolithic Magdalenian German economies.

Other behavioural adaptations may have been made. Division of labour, for example, may have changed in the manufacture of the lithics themselves. Typically, stone artefact production has been associated with men (e.g. Kohn and Mithen 1999:523–524; Sassaman 1992), but evidence from around the world attests to highly skilled females manufacturing lithics (e.g. Arakawa 2013; Bird 1993:26; Gero 1991; Gorman 1995; Gusinder 1931:353; Mason 1889:554; Roth 1899:151; Sellars 1885:872). In her ethnographic studies of female lithic producers at Konso in Ethiopia, Arthur (2010:232–238) observed that women developed highly refined skills over many years, manufacturing complex tools and travelling great distances to procure quality raw materials.

Behavioural changes may be more evident at Allen’s Cave in items made from organic material that has not preserved, despite the dry desert conditions potentially mitigating the typically poor preservation of organic resources (Matthiesen et al. 2014:479–480). Inhabitants of the rockshelter may have incorporated or indeed ceased using a wide variety of wooden objects (e.g. Dortch et al. 2012:128). They may have engaged in the trade of knowledge or ideas without this leading to archaeological visibility. Adjustments possibly occurred in social organisation, and the possibility of cultural restrictions on changes to stone artefact manufacturing techniques cannot be precluded.

An absence of grindstones and millstones at Allen’s Cave indicates that inhabitants most likely did not adjust their resource use by adopting a seed grinding economy during the LGM or at any other time. It is possible that grindstones were not identified during excavations at Allen’s Cave and other sites. If made from local limestone, polished surfaces may have been weathered and be undetectable, and grindstones can be amorphous and difficult to observe in rockshelter deposits (Fullagar and Field 1997:302–303; Hiscock 2008:208). Grindstones may also have been curated off-site. Nevertheless, according to existing evidence, grindstones are extremely rare across all of Pleistocene arid Australia (Fullagar and Field 1997:305; Smith 2013:98), suggesting that Allen’s Cave was typical. No grindstones, for example, were identified at Djadjiling (Law et al. 2010), Brockman (Slack et al. 2009) or Koonalda (Wright 1971a) and only one fragment was excavated at Puritjarra for the LGM, with no evidence of the material ground (Smith 1989:99; Smith 2006:395).

Occupants of Allen’s Cave most likely did not grind seeds or other plants because they did not need to. Given that the calorific gains from seed processing compared to the energy expended are relatively low (Cane 1989; O’Connell et al. 1983; Smith 2013:202), it seems probable that the small to medium game (Walshe 1994:257, 260) was relied upon. The limitation of the low net gain would have been compounded by the dearth of local grasslands during the LGM (Martin 1973:294, 300–301).

Seed processing has also generally been more associated with increased population and sedentism in the mid-late Holocene resulting in more stress on resource procurement. Under such circumstances, the increased reliability of seeds in comparison to energy-richer foods compensated for the disadvantage of the low net energy gains (Fullagar and Field 1997:306; Smith 2005). The advantage of the reliability of seeds was seen, for example, at Puntutjarpa, where more conducive environmental conditions and less reliable alternative food sources saw grindstones used for seed grinding throughout the Holocene (Gould 1977:87–91, 101; Hiscock 2008:215–216; see also Veth et al. 1997:24).

Flake platforms also demonstrate stone technological continuity at Allen's Cave during the LGM. Based on the excavated assemblages, flake platforms were prepared at effectively the same rate during the LGM in comparison to beforehand (2 of 5 during the LGM and 4 of 9 before the LGM [excluding crushed/shattered platforms]; Figure 6.7; Table A3). Platform preparation, in fact, remained in constant proportion for the majority of the time period c. 40,000–5000 BP (Figure 6.7; Table A3). Abraded, flaked and facetted platforms on flakes reflect the deliberate preparation of the surface prior to flaking in order to improve the chances of successful subsequent flake detachment (Clarkson and O'Connor 2006:168; Macgregor 2005; Pelcin 1997; Table 5.1). At Allen's Cave, however, natural, unprepared platforms represented approximately two thirds of platform types (Figure 6.7; Table A3), with an even greater 97% at Koonalda (Wright 1971a:54)—a predominance that further indicates that raw materials were so abundant that maximising flaking efficiency was not a priority. Such an indication is consistent with the regular discarding of non-exhausted cores.

Platform thickness and width on the Allen’s Cave lithics did not change by more than 2 mm over the 35,000 or so years (Table 6.9). The ≤ 2 mm is statistically insignificant. Pre-LGM and LGM mean platform thickness remained the same at 2 mm, while mean widths were 12 mm and 11 mm respectively (Table 6.9), a 1 mm difference which is also statistically insignificant.

Feather terminations on flakes were the dominant form at Allen’s Cave before and during the LGM (and for the remainder of human occupation), with relatively few abrupt terminations (Figure 6.10; Table A15). Some evidence suggests that feather terminations reflect a high level of control over the flaking process (Table 5.1). Feather terminations are, however, common, so further evidence would be needed, such as platform types reflective of deliberate platform preparation and overhang removal (e.g. Clarkson 2007:32; Clarkson and O’Connor 2006:168; Macgregor 2005; Pelcin 1997; Shafer 2008:1585–1586; Table 5.1).

Platforms and overhang removal at Allen’s Cave do not, however, indicate a particularly high level of control over the manufacturing process. Platforms were prepared on only around one third of occasions and no overhang removal was identified on any artefact. This is not to say that the Aboriginal people who used Allen’s Cave were incapable of applying high levels of skill in stone artefact production, but rather that they may not have needed to, as their survival for around 40,000 years in an arid landscape demonstrates.

Cortex was another aspect of Allen’s Cave stone technology that remained consistent from before and during the LGM. No cores were excavated for before the LGM but of the four LGM cores, two had no cortex present and two had less than 25% of their surface area covered with cortex (Figure 6.18; Table A9). Three of the 33 LGM flakes displayed cortex, which is a similar proportion to four of 27 pre-LGM flakes (Table 6.12), with an independent samples t-test indicating no statistical significance. The extent of cortex on these flakes from both periods was also minimal (Table 6.13). Because cortex extent has been demonstrated to be a valuable indicator of reduction stages

(Clarkson 2007:32–35; Dibble et al. 2005:546; Marwick 2008:1154; Table 5.1), the rare presence of cortex at Allen's Cave, particularly before and during the LGM (Table 6.13), most likely demonstrates that the majority of the flakes were the product of the mid-latter stages of core reduction. The relative rarity of cortex further indicates that the cores were reduced to at least a mid-range of their potential before being transported to the rockshelter, albeit not fully exhausted upon discard.

Cortex may indicate distances from raw material sources at which artefact reduction occurred (e.g. Dibble et al. 2005:546–558), but conclusions on this basis cannot be currently made for Allen's Cave. If, for example, more cortical flakes were recovered from a quarry site than from the related occupation site, this may indicate that decortification was carried out at the quarry and the cores transported to the occupation site for further reduction, i.e. that lithics had been 'imported' from the quarry site (Dibble et al. 2005:546–547). Both Allen's Cave assemblages, however, were excavated from within the rockshelter and no other lithics have been recovered from a separate potential quarry site—which, incidentally, may not exhibit easily detectable negative flake scars if chert, as veins within limestone, needed to be obtained with considerable breakage. Nevertheless, cortex on Allen's Cave lithics, in conjunction with previously discussed indications, suggests a mixture of on-site and off-site knapping. The on-site knapping is indicated by the overall scarcity of cortex at Allen's Cave and the continued presence of a high proportion of flaked pieces, while off-site knapping is inferred largely on the basis of the relative rarity of cores.

7.3 Implications for the 'Refuges, Barriers and Corridors' Model

Despite the likely absence of Aboriginal people for the first four millennia of the LGM, there is no environmental evidence that indicates that these 4000 years involved harsher conditions that were more likely to constitute a biogeographical 'barrier' (Chapter 3). The occupation gap may instead reflect a period of adjustment over hundreds of generations. The LGM constituted the most arid circumstances in the history of the human occupation of

Australia (Hesse et al. 2005:66; Smith 2013:110; Thorley 1998:36), yet lithics demonstrate persistent visitation to Allen's Cave throughout most of the hyper-arid period. Allen's Cave was not a 'barrier' to human occupation as suggested by Veth's (1989) model. Further, such occupation makes Allen's Cave one of the relatively rare sites regularly visited during the majority of the LGM (Balme 2000:4; Hughes and Sullivan 2014:28; O'Connor et al. 2014:10, 14, 20; Smith 2005:227; Thorley et al. 2011:47; Williams et al. 2015:99; Chapter 2 [2.1]; Table 2.1).

According to this analysis, Allen's Cave does not conform to Veth's (1989) argument that it would have been a 'corridor' during more favourable conditions. No peak in lithics (or other artefacts) occurred in the early Holocene, and stone artefacts indicated people's presence over many surrounding millennia of less favourable environmental circumstances (Table 6.5). Veth (1989) also argued that corridors involved narrower, more restricted foraging ranges with people having to rely on local raw materials. At Allen's Cave, however, people did not rely on local raw materials during the early Holocene to any greater extent than at any other time (Table 6.7). The presence of non-local artefactual raw material may in fact indicate an expansion rather than a restriction of foraging range and/or trade/exchange (discussed further in 7.5).

7.4 Implications for the 'Desert Transformation' Model

The technological evidence from the Allen's Cave lithics is not consistent with the concept of 'minor adaptations' that underpins the LGM arid zone settlement model of Hiscock and Wallis (2005). Hiscock and Wallis (2005) did not quantify what they considered to be 'minor' and they applied the notion of 'minor adaptations' broadly rather than specifically to stone artefacts or other aspects of past people's behaviour. Allen's Cave lithics, however, demonstrate no discernible change in any aspect during the LGM in comparison to beforehand. This consideration of the model may appear to be brief but it is based on the extensive evidence (and its summaries) in Chapter

6. The demonstration by such evidence of no significant changes precludes even ‘minor changes.’

7.5 Lithic Responses to the Early Holocene at Allen’s Cave

Lithic evidence from Allen’s Cave for the early Holocene (11,000–8000 BP) demonstrates technological continuity with the post-LGM period of around 8000 years (19,000–11,000 BP), but there are subtle indications of some behavioural change. Mean core length, width and thickness remained essentially the same (Figure 6.16; Table A8), with no statistical significance in the minor differences (Chapter 6 [6.2.8]). Although more multidirectional than unidirectional cores were deposited (n=5 and 1 respectively; Figure 6.14; Table A7) and core reduction resulted in one additional platform and 1½ more negative flake scars (Table 6.15), results from Chapter 6 (6.2.8) show that these changes are statistically insignificant. On this basis it cannot be inferred that early Holocene inhabitants worked their cores substantially more, or that they did so because of an increase in the pressure on raw material procurement.

Other early Holocene artefact attributes remained consistent with the preceding deglacial period (19,000–11,000 BP). This counts against the notion of additional pressure on raw material availability. Platforms on flakes were not prepared to any greater extent than previously (Figure 6.7; Table A14) and overhang removal remained absent. Median platform thickness was identical from before and during the early Holocene and median platform width differed by an insignificant 1 mm (p=0.547; Table 6.9). Mean flake dimensions were also almost identical (Figure 6.6; Table A2; Table 6.8) and flake termination types remained in consistent proportions (Figure 6.10; Table A4). Cortex on flakes was considerably more frequent from the early Holocene onwards (Table 6.12), which further suggests that raw materials were reasonably abundant (Table 5.1). The consistency in these artefact attributes indicates that early Holocene Allen’s Cave inhabitants did not attempt to increase their chances of successful flake detachment or to prolong the use-life of flakes any more than their predecessors, including those from the LGM. Instead they most likely continued to prioritise the relative ease of artefact manufacture, which is further suggestive of an abundant raw material supply.

There is no lithic or other archaeological evidence for a great influx of people during the early Holocene, in contrast to Cane's (1995:24, 30, 46) assertion. Cane (1995:24, 30, 46) based his argument on what he interpreted as a peak in lithic numbers and the presence of a 'major' hearth at around 10,000 BP. He did not, however, provide related quantitative details (Cane 1995:22–24, 30, 46), and the peak artefact discard rate at Allen's Cave between c. 40,000 and 5000 BP occurred after the early Holocene, from around 8000–5000 BP (Table 6.5).

Other archaeological evidence does not support Cane's (1995:24, 30, 46) argument. Faunal remains, according to Walshe (1994:257), indicate peak occupation intensity much later, at around 2300 BP. Cane (1995) does not offer evidence for an increase in human-induced sediment rates over the specific period of the early Holocene as distinct from the entire Holocene, and several hearths were present across a wide range of other time periods (Cane (1995:38).

Virtually no change occurred according to the technological classifications of the early Holocene lithics. The three backed artefacts excavated by Marun from c. 12,000–8000 BP (1972:250) may represent a technological behavioural change but their problematic provenance prevented the ability to access them and interpret their artefactual status (including to verify the presence of backing—although if assessed according to criteria outlined earlier, backed artefacts are easily identified). Marun's (1972) other eight backed artefacts and the two observed by Cane (1995:28) dated from the mid-Holocene. As indicated by totalling the relevant artefacts from Table 6.4, complete flakes with and without retouch before, during and after the early Holocene constituted 14%, 12% and 12% of total artefacts respectively. Retouch on complete and broken flakes (proximal, medial and distal) continued to be applied in consistent proportions (Table 6.10) and flaked pieces still represented approximately three quarters of the assemblage. A majority of flaked pieces is reasonably typical in other lithic assemblages, such as at Koonalda Cave where they comprised 88% (Wright 1971a:50–note that Wright uses the term 'residue').

The first appearance of a non-local raw material lends support to this hypothesis. A flaked piece made from silicified sandstone (Figure 6.4d) entered Allen's Cave at around 11,000 BP (Figure 6.5d; Table A1d; Table 6.7). Silicified sandstone is not known in the local region (Dr Alan Watchman 2015, pers. comm; SARIG 2016). The exact source of this raw material cannot be determined as it may have formed in numerous locations on the vast Nullarbor Plain during the changed marine and terrestrial sediment and chemical depositional processes brought about by the marine transgression of this time. During these processes silica would have been introduced into sandstone and acted as a cementing agent enabling it to be flaked, similar to the process involved in the formation of silcrete (Dr Alan Watchman 2015, pers. comm.; Webb et al. 2013:131). Silicified sandstone could also have been brought from even more distant sources.

The silicified sandstone flaked piece, however, most likely reflects trade/exchange and/or additional evidence for Allen's Cave occupants increasing their foraging range. This may have been a response to the improved environmental conditions. Such flexibility is evident at other arid sites such as Olympic Dam, where people travelled further during more favourable conditions and retreated in periods of aridity (Hughes et al. 2014). A similar pattern of mobility exists with the reversion at Puritjarra during the LGM to local sources of ochre (Hiscock 2008:61; Smith et al. 1998).

The presence of the non-local raw material may also reflect increasing social contact between Allen's Cave inhabitants and other groups as the climate improved. Trade/exchange and increased social contact during more favourable conditions is consistent with the past behaviour of a broad range of other Aboriginal groups over time. During the late Holocene and possibly earlier, for example, edge-ground axes, wooden materials, ochre and baler shell were distributed over much of Australia. Various routes extended from northern Queensland south to New South Wales and to Lake Eyre in South Australia (Dickson 1981:16–17; McBryde 1987:265–266; McCarthy 1976; McCarthy 1977:253; Tibbett 2002:24–28). Baler shell was traded over the last 2000 years to the Percival Lakes in the Great Sandy Desert in Western Australia from its nearest source around 400 km north (Smith and Veth 2004), and to the Olympic Dam region from several hundred kilometres and perhaps over 1000 km away (Robertson 2012:7–8).

The abalone shell (*Haliotis laevigita)* from Allen's Cave at c. 16,000 BP (Cane 1995:35), although unavailable for viewing in this study, may represent earlier trade/exchange and/or the expansion of foraging range. At this time the coast was approximately 70 km–80 km further south (Figure 3.1; Sahul Time 2016). No evidence of Aboriginal occupation has been excavated on the coast because this area is now submerged. This potential behavioural change indicated by the abalone shell pre-dates the optimal early Holocene, suggesting that non-environmental factors precipitated such change. Regardless, the silicified sandstone appearing 5000 years later during improved environmental conditions means that the environment as a catalyst for behavioural change cannot be completely precluded.

While around two thirds of the early Holocene Allen's Cave lithics continued to be manufactured from chert, another change occurred in that calcrete was no longer used. For the remainder of the period up to the mid-Holocene, c. 5000 BP, chert and chalcedony were the only materials represented, continuing in the proportion of two thirds to one third. The cessation of calcrete had virtually no impact on this ratio because calcrete had been previously used in such low proportions (Table 6.7). Raw material evidence therefore does not support Cane's (1995:25–27) argument that people at the start of the Holocene exponentially increased their use of 'flint,' regardless of whether this material is identified as flint or chert. The exclusive use of chert and chalcedony was most likely because both possess superior flaking qualities (Kamminga 1982:24–25; Luedtke 1992:75–83; Rapp 2009:76) and because calcrete had previously only been used opportunistically.

The presence of an early Holocene cockle shell (*Katelysia scalarina*), inaccessible to this research, represents some engagement of people around Allen's Cave with the ocean. It does not, however, indicate a consistent exploitation of oceanic resources. No other marine artefacts were excavated for the early Holocene despite the marine transgression resulting in the rockshelter being only around 10 km from the coast, suggesting that the small to medium prey on which people had previously relied (Walshe 1994:257, 260) remained abundant, and that any shellfish were harvested and consumed at the coast. It is, however, possible that fish otoliths, for example, were undetected during excavations. Marun (1972:142) used predominantly 6 mm and occasionally 3 mm sieves, while Cane's (1995:11) sieves were 5 mm and 8 mm. The 100 m high Nullarbor coastal cliffs (James et al. 2012:569) may have acted as a deterrent to regular coastal exploitation despite ethnographic evidence attesting to some avenues where they could be scaled, albeit with some risk (Bates 1918).

7.6 Comparisons with Marun and Cane

Interpretations reveal some similarities with and differences from those put forward by Marun (1972) and Cane (1995), in addition to those already discussed in this chapter. A major shared conclusion was that there was little change in the lithic technology at Allen's Cave. Marun (1972:332) and Cane (1995:31–34) argued, without providing complete quantitative evidence, that lithics became progressively smaller during the Holocene. Although the present research does not incorporate mid-late Holocene lithics, the early Holocene stone artefacts were indeed smaller than during the previous period of around 8000 years. The difference, however, was an insignificant ≤1 mm (Chapter 6 [6.2.3]; Figure 6.6; Table A2; Table 6.8). Cane's (1995:24, 30, 46) argument that a distinct peak in population occurred at Allen's Cave at the start of the Holocene is not supported by artefact discard rates and other archaeological material. Comparisons of lithics and other archaeological evidence from other arid sites does support Cane's (1995:24) conclusion that the settlement and foraging patterns of Allen’s Cave inhabitants were reasonably typical of people at other desert locations.

The primary aspect of difference is in relation to raw material identification. The ‘flint’ and ‘chert’ distinction is likely largely semantic naming practices, with Marun (1972:254) and Cane (1995:25) identifying flint for 81% and 78% of the stone artefacts respectively and the present study observing chert for 65%. For Marun (1972:254), the remainder of the raw materials were present in insignificant quantities, and for Cane (1995:25), varieties of limestone comprised 21% of the assemblage. Chalcedony and calcrete were uniquely identified in this research. Cane (1995:25–27) considered that ‘flint’ was greatly preferred when, according to his interpretation, its availability increased in the early Holocene. No evidence, however, was found in the present study for a shift, dramatic or otherwise, in the proportions of raw material use at any particular time (Table 6.7).

Like other lithic attributes, however, the value of raw material identification lies in the conclusions that can be inferred. The early Holocene stone artefact identified as silicified sandstone was likely the same lithic that Cane (1995:27) interpreted as silcrete. Cane (1995:27, 43) considered the non-local raw material to be the first evidence for ‘the movement of people’ and possible exchange. Similarly, the conclusion in the present study is that the silicified sandstone artefact represents behavioural change in the form of trade/exchange and/or the expansion of foraging range by early Holocene Allen’s Cave inhabitants.

Cane’s (1995) and Marun’s (1972) interpretations that Allen’s Cave was almost certainly abandoned for a period are supported, but the timing is not. Cane (1995:39–40) inferred that the rockshelter was possibly not used from c. 27,000–26,000 BP, while Marun (1972:328) implied that it was unoccupied from 17,500–15,000 BP. The present interpretation, however, is that people were likely absent for the first four millennia of the LGM, i.e. 30,000–26,000 BP, which perhaps indicates a substantial period of adjustment. Evidence from the re-analysis does not support Marun’s (1972) argument based on the recalibration and comparison with dates obtained by Cane (1995:13; Roberts et al. 1996:13, 15). Cane (1995) did not explicitly describe when within the LGM the lithics were deposited but correlations of Marun's (1972) and his dates assisted calculations to determine that no lithics (or other cultural material) were excavated for 30,000–26,000 BP (Chapter 4 [4.3.1 and 4.3.2]).

7.7 Chapter Summary

Stone technology at Allen's Cave during the LGM was continuous with that used by generations prior to the hyper-arid period. The homogeneity is not consistent with the concept of 'minor changes' under the desert transformation model (Hiscock and Wallis 2005), while the range of lithic evidence from the LGM and early Holocene discounts Veth's (1989) hypothesis placing Allen's Cave as a barrier (LGM) and corridor (early Holocene). Adjustments may have occurred in other aspects of culture, such as social organisation, religious practices or the use of items made from organic material that has not preserved. It therefore cannot be concluded that Aboriginal culture was static (e.g. Gould 1977:182). Early Holocene stone technology indicates a mixture of broad continuity and behavioural change. Such evidence suggests that while the environment may have had an influence on the change, so too might non-environmental factors.

Chapter 8: Conclusions

Evidence from Allen’s Cave contributes further to our understandings of the use of Australia’s arid zone. ‘Minor changes’ (Hiscock and Wallis 2005) were not made in stone technology in response to the LGM, although other, non-lithic adaptations may have occurred. Lithic evidence that the rockshelter did not act as a ‘barrier’ or ‘corridor’ adds a key arid zone site to the argument that additional sites may not support Veth’s (1989) pan-continental application of his model (Frankel 1993:28; Walshe 1994:266–276). Visits to Allen’s Cave were infrequent but persistent over c. 40,000 years despite the lack of permanent water, and the focus on small to medium prey supplemented by occasional large fauna is consistent with the presence of men, women and children (e.g. Walshe 1994:257–260). While continued research on archaeological indicators of gendered behaviour may add insights, it cannot be precluded that both sexes hunted and manufactured lithics, given Australian and international evidence to such effect (e.g. Arakawa 2013; Arthur 2010:232–238; Bird 1993:26; Gorman 1995; Gusinder 1931:353; Jarvenpa and Brumbach 2006:289–298). Spatial comparisons of the use of the rockshelter may be facilitated by a further excavation that could identify additional intra-site artefact discard locations.

It is proposed, on the basis of the lithic and faunal evidence, that Allen’s Cave was used for short-term stays by mobile desert families belonging to a geographically and socially extensive group that travelled long distances united in the shared knowledge of resource availability passed down over thousands of generations. Aboriginal culture is known for its emphasis on oral traditions and ethnographic evidence attests to the existence at least in recent millennia of widespread ‘song-lines’ detailing resource availability across thousands of square kilometres (e.g. Cane 2013:166–170; Sutton 1991:252–254). Other desert sites with regular water supply, such as Lawn Hill (Hiscock 1988, 2008:59) and Puritjarra (Smith 2006:373), were consistently occupied. For users of Allen’s Cave, however, temporary occupation of sites according to resource availability was likely, rather than the use of a more permanent base, particularly given the lack of permanent water on the Nullarbor. Similar occupation patterns appear at other arid zone sites lacking reliable water supply (Smith 2013:123–124).

This research has pursued a particular request from a member of the local FWCAC community. It cannot be confirmed on the basis of raw material evidence whether people inhabiting Koonalda Cave and Allen’s Cave were the same or distinct cultural groups in the distant past. Raw material from Koonalda was described as half ‘white flint’ and half ‘brown flint’ (Wright 1971a:52), while Allen’s Cave lithics are primarily lighter colours, with a minority of brown hues (Chapter 6 [6.2.2]). Wright’s (1971a:52) classification of Koonalda lithics as ‘flint’ was based on the material’s ‘identical’ flaking properties with those of the flint at ‘the home of flintknapping,’ Grimes Graves in East Anglia, and on the similar deposition occurring at both sites, consisting of ‘lines of nodules, formed in soft, marine limestone’ (Dr Richard Wright 2016, pers. comm.). No archaeological evidence has been excavated for Koonalda Cave after c. 14,000 BP (Wright 1971b).

The chert at Allen’s Cave and flint at Koonalda were local to each site (Chapter 4 [4.2]; Wright 1971a:49, 54, 56) and evidence suggests that they were reasonably abundant and relatively high in flaking quality. The brown chert was not present at Allen’s Cave. It therefore seems unlikely that separate cultural groups would have transported the same or very similar raw materials between the sites. People used Allen’s Cave only for temporary visitation and the 80 km between the sites was an accessible distance, given evidence for desert foragers traveling far greater distances (e.g. Hiscock 2008:61; McBryde 1987:252–73; Roth 1897; Smith and Veth 2004:37; Tibbett 2002:24–28; Tibbett 2006:26, 28–30; Veth 2003; Veth et al. 2011a:212–214). Therefore, whilst current archaeological evidence cannot conclusively answer the question, it is likely that people contemporaneously using Allen’s Cave and Koonalda Cave were part of the same cultural group that occupied a broad region of the Nullarbor.

The major findings of this thesis answer the research questions and aims, which concern human technological responses to the climatic fluctuations of the LGM and early Holocene. On the basis of the synthesis of the local palaeoenvironmental conditions and the technological lithic analysis, the hyper-aridity of the LGM did not act as a catalyst for stone technological change at Allen’s Cave. LGM lithics do not, however, support other factors as causes of behavioural adaptation because technological classifications, dimensions, raw materials and other attributes were continuous from the preceding period. While a future use-wear analysis could examine potential changes in the artefact functions, such homogeneity suggests that the lithics were not only effective in arid conditions but also during hyper-aridity. Technological behaviour at Allen’s Cave appears to be relatively typical of LGM desert foragers, with minimal change occurring, for example, in the lithics at Djadjiling (Law et al. 2010), Puritjarra (Smith 1989, 2006), Koonalda Cave (Wright 1971a) and Milly’s Cave (Marwick 2002:26–28).

Lithics from the early Holocene offer qualified support for the environment as an agent of behavioural change. Many aspects, such as flake and core dimensions, technological classifications, retouch and the frequency of platform preparation, indicate continuity with the preceding post-LGM period. Yet the non-local lithic raw material, present for the first time, indicates trade/exchange and/or an adjustment of foraging range as the local climate improved. Therefore, lesser-scale, but positive climatic changes as a catalyst for behavioural adaptation cannot be precluded.

Other evidence, however, suggests non-environmental influences. The fossilised abalone artefact (*Haliotis laevigita*), at c. 16,000 BP, may indicate the first exploitation of oceanic resources, but this pre-dates the optimal early Holocene. Backed artefacts have been interpreted, based on their ‘proliferation’ during the mid-Holocene aridity, as a risk minimisation response (Hiscock 1994, 2002). Yet the backed artefacts excavated by Marun (1972:250), representing a major technological change, are from the most favourable climatic period in the history of human occupation of Allen’s Cave. Support is therefore suggested for theories evoking social factors as causes of behavioural change, such as for the post-LGM shift to thumbnail scrapers in western Tasmania (McNiven 1994), and for mid-Holocene ‘intensification’ (e.g. discussion in Brian 2006; David and Lourandos 1998; Lourandos 1983, 1985; Lourandos and Ross 1994; Veth 2006).

The totality of the lithic evidence from Allen’s Cave does not support the environment as a driver of behavioural change. Environmentally deterministic studies that effectively dismiss other potential agents of change (e.g. Beaton 1985; Meggers 1960) are not applicable here. Humans first arrived in northern regions of Australia c. 50,000 BP (e.g. Geneste et al. 2012:3; Hiscock et al. 2016:2–6, 8, 10; Roberts et al. 1990:153–156; Smith 2013:3; van Holst Pellekaan 2012; Zazula 2000/2001:116,119). Coming from Southeast Asia, they encountered a landscape highly unfamiliar from their previous coastal environments (Balme et al. 2009:60–62; Oppenheimer 2012:770–771, 777–781; van Holst Pellekaan 2012). It is proposed that by the time of the initial human occupation of Allen’s Cave, some ten millennium later, a flexible people had adapted to the desert environment, having developed a robust technology, including lithics, with an intimate knowledge of the land. Their skills and technology proved effective over the ensuing 10,000 years. Upon the onset of the LGM, inhabitants of the rockshelter were a people with knowledge of arid-zone living that had developed over hundreds of previous generations. They did not need to change their stone technology at all.

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Appendices

Appendix 1: Permissions from the Far West Coast Aboriginal Corporation and the Flinders University Social and Behavioural Research Ethics Committee.

FAR WEST COAST ABORIGINAL CORPORATION

Registered Native Title Body Corporate ICN: 7985

To whom it may concern,

This letter is to confirm that Simon Munt, Flinders University archaeology student supervised by Dr Keryn Walshe from the South Australian Museum and by supervisors from Flinders University, has the endorsement of the Far West Coast Aboriginal Corporation (as Native Title holders) for the Far West Coast area; to work on research relating to stone artefacts from Allen's Cave, South Australia.

This letter confirms that the endorsement includes:

- endorsement for Simon Munt to access and/or use relevant archival documents and other relevant records from relevant institutions and agencies and is inclusive of consultant records/reports – bearing in mind that this corporation has no influence on such entities and their access to information policies;
- endorsement to access and research (including photographing) artefacts which may have been collected from Allen's Cave and which are stored in the South Australian Museum;
- Endorsement to seek community members who are individually willing to be photographed in relation to the study, upon the advice of Clem Lawrie a Cultural monitor via Dr. Kerryn Walshe;
- endorsement to apply for funding on the proviso that he cc this corporation any correspondence relating to funding applications sought or granted.

This letter also confirms that the Far West Coast Aboriginal Corporation will advise Simon Munt as to any relevant culturally appropriate protocols relating to the research program as deemed necessary through cultural monitor Clem Lawrie via Dr. Keryn Walsh of the SA Museum.

It is understood that Simon Munt will need to apply for Flinders University ethics approval. This process is endorsed and supported by the Far West Coast Aboriginal Corporation.

It is understood that the research program will incorporate the analysis of stone artefacts, the production of a thesis, development of a community poster, interviews/ discussions with community members and institutional visits.

The Corporation understands that Simon Munt will need to produce publications relating to the project in order to fulfill his academic aspirations and we will work with them to achieve this and ensure information is culturally appropriate. We ask that Simon explore co-authorship possibilities in this regard.

No site coordinates etc. are to be included in any thesis or publication and can only be referred to in a general sense.

This Corporation will monitor activities of Simon Munt in 2015, this endorsement can be revoked upon concerns of non-compliance with items expressed in this letter. The Corporation encourages Simon to work closely with Dr. Kerryn Walshe and Clem Lawire – Senior Elder for the Mirning.

No visits to the cave area are expected as necessary, if this changes further endorsement from this corporation will be required.

The Corporation wishes Simon Munt every success with his research schedule and outcomes for 2015.

Yours sincerely

Kerrie Harrison

Corporate Services Manager
Far West Coast Aboriginal Corporation
Registered Native Title Body Corporate

19 December 2014

CC – Basil Coleman FWCAC Chairperson and Dr Keryn Walshe SA Museum

Dear Simon,

The Chair of the Social and Behavioural Research Ethics Committee (SBREC) at Flinders University considered your response to conditional approval out of session and your project has now been granted final ethics approval. This means that you now have approval to commence your research. Your ethics final approval notice can be found below.

FINAL APPROVAL NOTICE

Project No.:	**6853**
Project Title:	A technological analysis of stone artefacts from Allen's Cave, South Australia
Principal Researcher:	Mr Simon Munt
Email:	munt0013@flinders.edu.au

Approval Date:	17 June 2015	Ethics Approval Expiry Date:	**31 December 2018**

The above proposed project has been approved on the basis of the information contained in the application, its attachments and the information subsequently provided.

RESPONSIBILITIES OF RESEARCHERS AND SUPERVISORS

1. Participant Documentation

Please note that it is the responsibility of researchers and supervisors, in the case of student projects, to ensure that:

- All participant documents are checked for spelling, grammatical, numbering and formatting errors. The Committee does not accept any responsibility for the above mentioned errors.

- The Flinders University logo is included on all participant documentation (e.g., letters of Introduction, information Sheets, consent forms, debriefing information and questionnaires – with the exception of purchased research tools) and the current Flinders University letterhead is included in the header of all letters of introduction. The Flinders University international logo/letterhead should be used and documentation should contain international dialling codes for all telephone and fax numbers listed for all research to be conducted overseas.
- The SBREC contact details, listed below, are included in the footer of all letters of introduction and information sheets.

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 'INSERT PROJECT No. here following approval'). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.

2. Annual Progress / Final Reports

In order to comply with the monitoring requirements of the *National Statement on Ethical Conduct in Human Research (March 2007)* an annual progress report must be submitted each year on the 17 June (approval anniversary date) for the duration of the ethics approval using the report template available from the Managing Your Ethics Approval SBREC web page. *Please retain this notice for reference when completing annual progress or final reports.*

If the project is completed *before* ethics approval has expired please ensure a final report is submitted immediately. If ethics approval for your project expires please submit either (1) a final report; or (2) an extension of time request and an annual report.

Student Projects

The SBREC recommends that current ethics approval is maintained until a student's thesis has been submitted, reviewed and approved. This is to protect the student in the event that reviewers recommend some changes that may include the collection of additional participant data.

Your first report is due on 17 June 2016 or on completion of the project, whichever is the earliest.

3. Modifications to Project

Modifications to the project must not proceed until approval has been obtained from the Ethics Committee. Such proposed changes / modifications include:

- Change of project title;
- Change to research team (e.g., additions, removals, principal researcher or supervisor change);
- Changes to research objectives;
- Changes to research protocol;
- Changes to participant recruitment methods;
- Changes/additions to source(s) of participants;
- Changes of procedures used to seek informed consent;
- Changes to reimbursements provided to participants;
- Changes/additions to information and/or documentation to be provided to potential participants;
- Changes to research tools (e.g., questionnaire, interview questions, focus group questions);
- Extensions of time.

To notify the Committee of any proposed modifications to the project please complete and submit the *Modification Request Form* which is available from the Managing Your Ethics Approval SBREC web page. Download the form from the website every time a new modification request is submitted to ensure that the most recent form is used. Please note that extension of time requests should be submitted prior to the Ethics Approval Expiry Date listed on this notice.

Change of Contact Details

Please ensure that you notify the Committee if either your mailing or email address changes to ensure that correspondence relating to this project can be sent to you. A modification request is not required to change your contact details.

4. Adverse Events and/or Complaints

Researchers should advise the Executive Officer of the Ethics Committee on 08 8201-3116 or human.researchethics@flinders.edu.au immediately if:

- any complaints regarding the research are received;
- a serious or unexpected adverse event occurs that effects participants;
- an unforeseen event occurs that may affect the ethical acceptability of the project.

Kind regards

Andrea

Mrs Andrea Fiegert and Ms Rae Tyler
Ethics Officers and Executive Officer, Social and Behavioural Research Ethics Committee
Andrea - Telephone: +61 8 8201-3116 | Monday, Tuesday and Wednesday
Rae – Telephone: +61 8 8201-7938 | 1Ž2 day Wednesday, Thursday and Friday
Email: human.researchethics@flinders.edu.au
Web: Social and Behavioural Research Ethics Committee (SBREC)

Manager, Research Ethics and Integrity – Dr Peter Wigley
Telephone: +61 8 8201-5466 | email: peter.wigley@flinders.edu.au
Research Services Office |Union Building Basement
Flinders University
Sturt Road, Bedford Park | South Australia | 5042
GPO Box 2100 | Adelaide SA 5001

Appendix 2: Documents Provided to Participant Mr Clem Lawrie in Meeting 16 November 2015: Introduction Letter, Project Information Sheet, Consent Form.

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Flinders University of South Australia
Department of Archaeology
GPO Box 2100
Adelaide SA 5001
Tel: 08 8201 2578
Fax: 08 8201 3635
Email: amy.roberts@flinders.sa.edu
alice.gorman@flinders.sa.edu
CRICOS Provider No. 00114A

LETTER OF INTRODUCTION

16 November 2015

Dear Sir/Madam

This letter is to introduce Simon Munt who is a Masters of Archaeology and Heritage Management student in the Department of Archaeology at Flinders University. He will produce his student card, which carries a photograph, as proof of identity.

He is undertaking research leading to the production of a thesis and potentially other publications on the subject of 'A technological analysis of stone artefacts from Allen's Cave, South Australia.'

He has obtained permission to undertake this study from the Far West Coast Aboriginal Corporation (FWCAC), which will monitor his research progress and assist with cultural protocols, including the contacting of potential participants. This signed permission letter is also provided.

Simon would like to invite you to assist with this project by attending a brief information session at the time, where he will outline the nature of his research. You will have the opportunity to view and handle the artefacts and to discuss the project in an informal manner. Simon would also like to invite you to agree to be photographed engaging with some of the stone artefacts and potentially a small number of other Aboriginal people who will also be recruited by the FWCAC. No more than an hour on one occasion would be required, excluding travel. Your participation is entirely voluntary, without obligation and would occur at the South Australian Museum's store in Hindmarsh, South Australia.

Along with this letter you are also supplied with an Information Sheet that provides details of Simon's project. Should you wish to participate please indicate your consent on the provided Consent Form, which you may return to me via post or email on the relevant address at the top corner of this page.

Because this project involves photography, should you give your consent to be photographed you will not be able to choose to remain anonymous nor can your participation be kept confidential. You are at any time before the final thesis is submitted for assessment, entirely free to withdraw your consent for your photograph to be used, without negative consequence. Simon will also seek to publish an article about his research following its completion. You are also entirely free to withdraw your consent for him to use your photo in any such publication, at any time before such publication occurs. You may withdraw your consent by contacting the FWCAC; us as Simon's supervisors with our details at the top corner of this page; or Simon himself, via his email address: munt0013@flinders.edu.au

No video or audio recording will occur, nor will any secretarial, transcription or translator services be involved in the production of the thesis. Any enquiries you may have concerning this project should be directed to either of us at the address, telephone or fax given above.

Thank you for your attention and assistance.

Yours sincerely

Dr Amy Roberts
Senior Lecturer, Department of Archaeology, Flinders University of South Australia.

Dr Alice Gorman
Lecturer, Department of Archaeology, Flinders University of South Australia.

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project number 6853). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 82012035 or by email human.researchethics@flinders.edu.au

inspiring achievement

ABN 65 524 596 200 CRICOS Provider No. 00114A

INFORMATION SHEET

Project Title: An analysis of stone artefacts from Allen's Cave, South Australia

Researcher: Simon Munt, Masters student in the Department of Archaeology, Flinders University. Email: munt0013@flinders.edu.au

Supervisors:

1. Dr Amy Roberts, senior lecturer in the Department of Archaeology, Flinders University. Phone: 82012217; email: amy.roberts@flinders.edu.au
2. Dr Alice Gorman, lecturer in the Department of Archaeology, Flinders University. Phone: 82012217; email: alice.gorman@flinders.edu.au
3. Dr Keryn Walshe, senior archaeologist, South Australian Museum. Phone: 8207 7500.

Assisting Organisation:

Far West Coast Aboriginal Corporation (FWCAC); contact Kerrie Harrison, ph: 8625 3340.

Description of Project:

This project is a research thesis involving an analysis of Aboriginal stone artefacts from Allen's Cave on South Australia's far west coast. These artefacts, stored at the South Australian Museum's Hindmarsh store, are in two separate assemblages, one having been excavated by Ljubomir Marun and colleagues in 1969 and the other excavated by Scott Cane and colleagues in 1989. The oldest artefacts date back to approximately 39,000 years ago.

The project will use contemporary methods of analysis to seek information about two main topics:

1. How Aboriginal people from the Allen's Cave site and region changed their stone artefact technology in response to periods of environmental change; and

2. How Allen's Cave, given its antiquity and situation in Australia's arid zone, can contribute to our understandings about the nature of the settlement and use of Australia's arid zone over time, particularly in relation to existing theories.

What will I be asked to do?

You are invited to attend an informal information session given by the researcher and to view and handle the artefacts and informally discuss the project. You are also invited to participate in the project by agreeing to be photographed engaging with the artefacts and the researcher as well as potentially a small number of other Aboriginal people recruited by the Far West Coast Aboriginal Corporation (FWCAC), the organisation that will be monitoring the researcher's progress and assisting with cultural protocols.

Aside from travel time this will take no more than approximately an hour. Approximately 15-20 minutes of this will be for the information session, with another 15-20 minutes for viewing and handling the artefacts, another 5 or so minutes for the photo and any other time you may wish to spend on discussion and/ or artefact viewing and handling.

All of this will occur at the South Australian Museum store in Hindmarsh. You will be notified of the precise date and time as soon as it is confirmed.

How do I participate?

Your participation is entirely voluntary. Should you wish to participate please fill out the provided Consent Form and return it to any of the contacts listed in the box on the first page of this Information Sheet. If you provide your written consent in this way the researcher will include your photograph in his thesis and in any possible publication(s) that may result from the project.

If you wish to withdraw your consent for your photograph to be used in the thesis you may do so, without negative consequence, at any time up to its final submission to the Department of Archaeology at Flinders University. If after submission of the thesis you wish to withdraw your consent for use of your photo in any subsequent publication(s) you are also entirely free to do so, again without negative consequence, up to the time of publication(s). You may do this by contacting any of the contacts listed in the box on the first page of this Information Sheet. It is likely that any publication(s) would occur in the form of a journal article.

The FWCAC will, in accordance with cultural protocols, assist in participant selection and advise potential participants of their being chosen for participation. The FWCAC will also advise on how to phone the researcher should you wish to seek for further details at this recruitment stage.

The researcher will be applying for funding which if received he intends to use to monetarily reimburse you for your costs related to your participation, such as for transport and accommodation. He will provide further details to you when these details are known.

Can my involvement be anonymous and confidential?

Because your involvement may involve a photograph you can not choose for your involvement to be anonymous or confidential if you provide consent and do not withdraw consent up to the time of the completion of the thesis and of any subsequent publications being in press.

How will I benefit from participating in this project?

These artefacts are from your region and your culture. They are stored a long way from where they came from in your region. They can help us to learn a lot about how your ancient ancestors lived. By participating, including viewing and handling the artefacts 'face to face' you will likely feel a connection with this part of your culture and past. Participation presents an opportunity to connect with an important aspect of your culture and heritage and to help the researcher to explore the past life ways of Aboriginal people from the far west coast region and then to benefit the wider community by communicating findings to the other Aboriginal peoples and the archaeological and broader community. Your participation will help the researcher to bring further attention to the way that your people lived from as long ago as around 40,000 years before today.

Are there any risks or discomfort if I participate in this project?

The researcher does not anticipate any risks or discomfort associated with your involvement in this study. If, however, you have any concerns about or feel any potential discomfort or risks, or wish to express any complaints, please raise them with the researcher or another of the contacts in the box on the front page of this Information Sheet. You may also choose to seek support around cultural issues from the FWCAC on 8625 3340. Should you at any time wish to speak to a professional service regarding these matters you can contact support services such as Lifeline by phoning 131114.

How will I receive feedback about this project?

Upon its completion the researcher will provide a full copy of the thesis to the FWCAC, which will store and allow access to it according to its own cultural protocols. A digital copy will also be stored on the Flinders University computer server, in the Department of Archaeology, for at least five years. The researcher will also provide to the FWCAC a community poster which encapsulates the project.

Thank you for taking the time to read this information and I hope that you are able to accept my invitation to be involved.

Simon Munt.

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 6853). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au

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CONSENT FORM FOR PARTICIPATION IN RESEARCH

(by participation in photograph and stone artefact viewing and discussion)

An analysis of stone artefacts from Allen's Cave, South Australia

I Clem Lawrie

being over the age of 18 years hereby consent to participate as requested in the photograph and stone artefact viewing/ handling/ discussion for the research project on 16 November 2015.

1. I have read the information provided (Letter of Introduction and Information Sheet).
2. Details of procedures and any risks have been explained to my satisfaction.
3. I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
4. I understand that:
   - I may not directly benefit from taking part in this research.
   - I am free to withdraw from the project at any time without negative consequence and am free to decline to answer particular questions.
   - I can indicate my wish to withdraw my consent verbally and/ or in writing via email to the researcher, his supervisors or the Far West Coast Aboriginal Corporation (FWCAC) and that the relevant contact details are contained in the Information Sheet.
   - The photograph taken of me and other participants will be included in the researcher's completed thesis and that it may also be included in any subsequent publication(s), and that this means that my participation can not be kept anonymous or confidential
   - If I wish to withdraw my consent for the use of my photograph in the thesis I must do so before the thesis is submitted to the Department of Archaeology for final assessment.
   - If I wish to withdraw my consent for the use of my photograph in publications subsequent to the thesis I must do so before any such publications should occur.
   - The researcher's completed thesis will be stored digitally on the Flinders University computer server via the Department of Archaeology for at least five years following the date of its return from assessment; and a copy will also be provided to the FWCAC which will store it according to its own cultural protocols.

7. I have had the opportunity to discuss taking part in this research with a family member or friend.

Participant's signature Clem Lawrie **Date** 16/11/15

I certify that I have explained the study to the volunteer and consider that she/he understands what is involved and freely consents to participation.

Researcher's name Simon Munt

Researcher's signature [signature] **Date** 16/11/15

Appendix 3: List of Chenopod Species Present in the Allen's Cave Region

Pollen samples from Allen's Cave cores reveal the presence of 33 taxa of chenopods (Martin 1973:311, 313):

1. *Dysphania littoralis*
2. *Atriplex angulatum*
3. *Rhagodia baccata*
4. *Bassia anisacanthoides*
5. *Atriplex leptocarpa*
6. *Chenopodium ambrosioides*
7. *Atriplex vesicaria*
8. *A. acutibracia*
9. *Dysphania plantaginella*
10. *Chenopodium psuedomicrophyllum*
11. *Rhagodia crassfolia*
12. *R. spinescens*
13. *Arthrocnenum australasium*
14. *Chenopodium desertorium*
15. *Salsola kali*
16. *Arthrocnenum halocnemoides*
17. *A. lieostachyum*
18. *Bassia sclerolaenoides*
19. *Kocia georgei*
20. *K. enchylaenoides*
21. *Atriplex cinerea*
22. *A. nummularia*
23. *Enchylaena tomentose*
24. *Ptilotus exaltus*
25. *Bassia patenticuspis*
26. *B. uniflora*
27. *B. brevifolia*
28. *Kochiatriplera*
29. *K. sedifolia*
30. *Amaranthus albus*
31. *Threlkeldia diffusa*
32. *Ptilotus obovatus*
33. *P. gaudichaudii*

Appendix 4: Tabular Data Corresponding with Chapter 6 Graphs

Tables A1–A9 constitute the raw data from which graphs were created in Chapter 6 and are thus also presented according to specified time periods.

Table A1a–e relates to Figure 6.5a–e, revealing raw material use for technological kinds of artefacts present during each time period.

Table A1a Raw materials for artefacts of each technological classification, pre-LGM.

Artefact 'Technological Status'	Chert		Chalcedony		Calcrete	
	No	%	No	%	No	%
Complete flake, no retouch	2	67	1	33	0	0
Proximal flake, no retouch	4	100	0	0	0	0
Complete flake, retouch	2	100	0	0	0	0
Proximal flake, retouch	2	100	0	0	0	0
Flaked piece	11	69	1	6	4	25

Table A1b raw materials for artefacts of each technological classification, LGM.

Artefact 'Technological Status'	Chert		Chalcedony		Calcrete	
	No	%	No	%	No	%
Complete flake, no retouch	1	100	0	0	0	0
Proximal flake, no retouch	2	67	0	0	1	33
Complete flake, retouch	3	100	0	0	0	0
Flaked piece	15	58	6	23	5	19
Unidirectional core	3	100	0	0	0	0
Multidirectional core	0	0	0	0	1	100

Table A1c Raw materials for artefacts of each technological classification, between the LGM and early Holocene.

Artefact 'Technological Status'	Chert		Chalcedony		Calcrete	
	No	%	No	%	No	%
Complete flake, no retouch	13	28	33	70	1	2
Proximal flake, no retouch	14	50	14	50	0	0
Medial flake, no retouch	1	100	0	0	0	0
Distal flake, no retouch	0	0	1	100	0	0
Complete flake, retouch	18	53	16	47	0	0
Proximal flake, retouch	7	88	1	12	0	0
Medial flake, retouch	1	50	1	50	0	0
Distal flake, retouch	4	80	1	20	0	0
Flaked piece	282	71	92	23	24	6
Unidirectional core	12	45	6	22	9	33
Multidirectional core	11	55	9	45	1	<1 (.05)

Table A1d Raw materials for artefacts of each technological classification, early Holocene.

Artefact 'Technological Status'	Chert		Chalcedony		Silicified Sandstone	
	No	%	No	%	No	%
Complete flake, no retouch	4	29	10	71	0	0
Proximal flake, no retouch	4	100	0	0	0	0
Medial flake, no retouch	1	100	0	0	0	0
Complete flake, retouch	6	86	1	14	0	0
Proximal flake, retouch	3	75	1	25	0	0
Medial flake, retouch	2	100	0	0	0	0
Distal flake, retouch	1	100	0	0	0	0
Flaked piece	94	68	44	32	1	0.8
Unidirectional core	1	100	0	0	0	0
Multidirectional core	4	80	1	20	0	0

Table A1e Raw materials for artefacts of each technological classification, post early Holocene to mid-Holocene.

Artefact 'Technological Status'	Chert		Chalcedony	
	No	%	No	%
Complete flake, no retouch	11	48	12	52
Proximal flake, no retouch	2	40	3	60
Medial flake, no retouch	1	100	0	0
Distal flake, no retouch	0	0	1	100
Complete flake, retouch	11	79	3	21
Proximal flake, retouch	2	100	0	0
Flaked piece	163	66	84	34
Unidirectional core	5	100	0	0
Multidirectional core	4	100	0	0

Table A2 relates to Figure 6.6 and demonstrates a broad trend over the c. 35,000 years of flakes becoming slightly smaller. As discussed in Chapter 7, almost no change occurs from before and during the LGM, particularly when it is remembered that these measurements are in millimetres, and there is no statistical significance in these negligible changes.

Table A2 Mean flake dimensions.

Time Period	Length (mm)	Width (mm)	Thickness (mm)
Pre-LGM	21	17	4.5
LGM	20	13	4.3
Between LGM and Early Holocene	16	11	3
Early Holocene	16	10	2
Post Early Holocene to Mid-Holocene	14	9	2

Table A3 relates to Figure 6.7, showing that platforms were predominantly natural, being prepared on only around one-third of occasions from c. 40,000–5000 BP.

Table A3 Platform types on flakes.

Time Period	Abraded	Flaked	Crushed/ Shattered	Facetted	Cortical	Natural	Indeter-minate	Total
Pre-LGM	1	3	1	–	–	5	–	10
LGM	–	2	4	–	–	3	–	9
Between LGM and Early Holocene	5	14	3	5	5	78	1	111
Early Holocene	2	5	2	3	–	17	–	29
Post Early Holocene to Mid-Holocene	–	4	1	2	3	34	–	44
Total	8	28	11	10	8	137	1	203

Table A4 relates to Figure 6.10, showing the numbers of each flake termination type, with feather terminations accounting for the vast majority.

Table A4 Flake termination types.

Time Period	Feather	Step	Hinge	Plunge	Total
Pre-LGM	4	–	–	1	5
LGM	3	–	–	1	4
Between LGM and Early Holocene	62	6	5	1	74
Early Holocene	21	–	1	–	22
Post Early Holocene to Mid-Holocene	28	4	2	1	35
Total	118	10	8	4	140

Table A5 corresponds to Figure 6.11, demonstrating the types of retouch applied on flakes by people inhabiting Allen's Cave.

Table A5 Retouch types on flakes.

Time Period	Scalar	Steep	Serrated	Scalar and Serrated	Total
Pre-LGM	2	1	–	–	3
LGM	3	–	–	–	3
Between LGM and Early Holocene	24	3	18	–	45
Early Holocene	7	1	2	1	11
Post Early Holocene to Mid-Holocene	10	2	3	–	15
Total	46	7	23	1	77

Table A6 corresponds to Figure 6.12, demonstrating that retouch was consistently applied minimally.

Table A6 Retouch invasiveness.

Time Period	1%–25%	26%–50%	51%–75%	76%–100%
Pre-LGM	3	–	–	–
LGM	3	–	–	–
Between LGM and Early Holocene	41	3	1	–
Early Holocene	11	–	–	–
Post Early Holocene to Mid-Holocene	15	–	–	–
Total	73	3	1	0

Table A7 is the raw data for Figure 6.14, demonstrating the numbers of unidirectional and multidirectional cores per time period.

Table A7 Core types.

Time Period	Unidirectional	Bidirectional	Total
Pre-LGM	–	–	0
LGM	3	1	4
Between LGM and Early Holocene	27	21	48
Early Holocene	1	5	6
Post Early Holocene to Mid-Holocene	5	4	9
Total	36	31	67

Table A8 relates to Figure 6.16, showing the dimensions of cores per time period, with rounded standard deviation expressed in brackets.

Table A8 Mean core dimensions.

Time Period	Length (mm)	Width (mm)	Thickness (mm)
Pre-LGM	–	–	–
LGM	35 (11)	29 (6)	16 (5)
Between LGM and Early Holocene	34 (13)	23 (12)	11 (8)
Early Holocene	31 (13)	22 (9)	12 (7)
Post Early Holocene to Mid-Holocene	40 (15)	22 (9)	8 (5)

Showing cortex coverage on cores per time period, Table A9 is the raw data for Figure 6.18. On the majority of occasions cortex had either been completely or mostly removed in the manufacturing process, and no core exhibited cortex coverage of more than 50%.

Table A9 Cortex coverage on cores.

Time Period	No. of cores with 0%	No. of cores with 1%–25%	No. of cores with 26%–50%
Pre-LGM	–	–	–
LGM	–	2	–
Between LGM and Early Holocene	38	9	2
Early Holocene	4	3	–
Post Early Holocene to Mid-Holocene	5	4	–

Appendix 5: Raw Data

Appendix 5 is all of the raw data collected in this analysis, with abbreviations explained as follows:

- 'Art_No'= artefact number from South Australian Museum
- 'M.C' = Marun or Cane (referring to the assemblage from which each artefact came)
- 'Spit' = the stratigraphic/arbitrary layer from which the artefact was excavated
- 'Time_Period' = the time period of focus in this study
- 'Typology' = the 'typological type' of artefact

- Scraper flat-e = flat-edged scraper
- Scraper round-e = round-edged scraper
- Scraper conc & n = concave and nosed scraper
- Scraper steep-e = steep-edged scraper
- Unr/t flake = unretouched flake
- R/t flake = retouched flake
- Backed art = backed artefact
- H'hoof core = horsehoof core

- 'Technol_Status' = the technological classification of each artefact

- Comp. flake, no r/t = complete flake, no retouch
- Prox. flake, no r/t = proximal flake, no retouch
- Med. flake, no r/t = medial flake, no retouch
- Comp. flake, r/t = complete flake, with retouch
- Prox. flake, r/t = proximal flake, with retouch
- Med. flake, r/t = medial flake, with retouch
- Unid'l core = unidirectional core
- Multid'l core = multidirectional core
- Flaked p = flaked piece

- 'Raw_M' = raw material

- Chalc = chalcedony
- Calc = calcrete
- Silicifi = silicified sandstone

- ‘Colour’ = artefact colour
  - Codes = referring to Munsell Colour Chart for Rocks
- ‘Weight’ = artefact weight in grams
- ‘Length’ = artefact length in millimetres
- ‘Width’ = artefact width in millimetres
- ‘Thick’ = artefact thickness in millimetres
- ‘Cortex’ = whether cortex was present or absent
- ‘Cortex_Ext.’ = the extent to which an artefact displayed cortex
- ‘P. Type’ = platform type in millimetres
- ‘P. Thick’ = platform thickness in millimetres
- ‘P. Width’ = platform width in millimetres
- ‘O_h. Rem’ = overhang removal (N = no; Y = yes)
- ‘Term_Type’ = termination type
- ‘Retouch’ = whether retouch was present (A = absent; P = present)
- ‘R_t Margins’ = refers to the number of retouched margins on a flake
- ‘R_t_Type’ = retouch type
- ‘R_t_Locn’ = retouch location
  - DRM = dorsal right margin
  - DLM = dorsal left margin
  - DDM = dorsal distal margin
  - DMM = distal medial margin
  - VRM = ventral right margin
  - VLM = ventral left margin
  - VPM = ventral proximal margin
  - VDM = ventral distal margin
  - VMM = ventral medial margin
  - PM = proximal margin
  - DM = distal margin
- ‘R_t_Inv = retouch invasiveness
- ‘Core_No_of_Platforms’ = number of platforms on a core
- ‘Core_No_Neg_FS = number of negative flake scars on a core

‘Comments’ could not fit onto the following raw data pages so they are replicated below, with the artefact number then associated comment.

24. One possible notch, but probably edge damage
29. Flake that was used as a core
59. Nearly in 26%-50% cortex category
75. Very translucent
87. Not quite discoidal, no stacked step fractures so not h'hoof core
88. Quite pronounced negative bulb
99. Very different colour
101. Flake used as a core; also prominent eraillure scar
102. Similar to a h'hoof core but no stacked step fractures
103. Flake used as a core
137. Flake used as a core
151. One large negative bulb
154. Termination removed through distal retouch
188. Termination removed through distal retouch
189. Prominent patch of 5R 3/4 Dusky red, under 1 sq. cm
203 & 204. Mostly covered in sediment; therefore very difficult to analyse
207. Transverse snapped
213. Flake used as a core
229. Retouched flake used as a core; steep r/t occurs on DRM & DLM
239. Transverse snapped
249. Transverse snapped
294. Flake used as a core
329. Cane label= 'in situ flake' but I think= core
362. Bag label= E3/21/4 but artefact label= E3/21/3; I use latter.
374. Termination removed by r/t
399. Washed it in water to help to ID raw material & colour (only artefact I washed)
400. Flake used as a core
403. Very translucent
448. Almost complete flake but termination just snapped off
449. Termination only just snapped before end
473. Transverse snapped
479. Possible notch on dorsal right distal; likely in fact edge damage
480. Probably longitudinally snapped
517. Prominent negative bulb
541. Small amount of r/t taken off the platform
575. Transverse snapped
603. Transverse snapped
608. Transverse snapped
602. Probably longitudinally snapped
641. Broken flake used as a core
677. Cane labelled 'obliquely retouched' but I see no r/t
681. Tiny platform & eraillure scar
688-690. Cane labelled bag as 'conjoin' but I couldn't join these
726. 'Hole' in dorsal surface 13mm x 6mm by est. depth 4mm, filled w sediment
716. Transverse snapped
718. Transverse snapped
727. Transverse snapped; possible notch but more likely it's edge damage
729. Probably longitudinally snapped
786. Only horsehoof core!
803. Quite a pronounced bulb
813. Possibly a notch but may be edge damage instead
815. Transverse snapped; prominent ripple marks
816. Cane labelled it 'backed flake' but I disagree: no platform, retouch, termination
836. Possibly a notch but may instead be edge damage
838. Flake used as a core
855. White colour=stone's cortex
858. Almost transparent.
885. Flake used as a core
894. Approx.1/3 of platform was cortex (the rest being natural)
895. Probably longitudinally snapped
918. Flake used as a core
919. Flake used as a core
922. Platform crushed so unable to be measured
981. Plunge termination (rare)
1009. Flake used as a core
1010. One possible notch but more likely= damage

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
1	D2/29	C	Pre LGM	29	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	1	19	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
2	D2/29	C	Pre LGM	29	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	3	20	14	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
3	D2/29	C	Pre LGM	29	Flaked piece	Flaked p.	Calcrete	5YR 6/4 ...	21	51	44	11	No	0%	.	.	.	N	.	A	.	.		.	.	.
4	D2/29	C	Pre LGM	29	Flaked piece	Flaked p.	Calcrete	5YR 6/4 ...	0	17	5	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
5	D2/29	C	Pre LGM	29	Flaked piece	Flaked p.	Calcrete	5YR 6/4 ...	0	24	11	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
6	D2/29	C	Pre LGM	29	Flaked piece	Flaked p.	Calcrete	5YR 6/4 ...	0	16	14	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
7	D2/29	C	Pre LGM	29	Flaked piece	Flaked p.	Chert	5YR 6/4 ...	0	8	6	2	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
8	D2/29	C	Pre LGM	29	Flaked piece	Flaked p.	Chert	10R 2/2 ...	0	15	12	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
9	D2/28	C	Pre LGM	28	Scraper flat-e	Comp. flake,R/t	Chert	10YR 7/4...	2	28	17	4	No	0%	Natural	2	9	N	Feather	P	1	scalar	DRM	1%-25%	.	.
10	D2/28	C	Pre LGM	28	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	8	6	1	No	0%	Abraded	2	3	N	Feather	A	.	.		.	.	.
11	E3/47/1	M	Pre LGM	47	Unr/t flake	Prox. flake,no R/t	Chert	5YR 6/4 ...	13	25	35	11	No	0%	Flaked	3	14	N	.	A	.	.		.	.	.
12	E3/47/2	M	Pre LGM	47	Scraper round-e	Prox. flake,R/t	Chert	10YR 8/2...	3	13	31	7	No	0%	Natural	3	31	N	.	P	1	scalar	Dorsal distal	1%-25%	.	.
13	E3/47/3	M	Pre LGM	47	Flaked piece	Flaked p.	Chert	10YR 8/2...	0	18	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
14	E3/46/1	M	Pre LGM	46	Flaked piece	Flaked p.	Chert	10YR 8/2...	2	33	20	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
15	E3/44/1	M	Pre LGM	44	Flaked piece	Flaked p.	Chert	10YR 8/2...	4	31	26	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
16	E3/42/1	M	Pre LGM	42	R/t flake	Comp. flake,R/t	Chert	10YR 8/2...	5	30	20	6	Yes	1%-25%	Natural	2	15	N	Feather	P	2	steep	DRM & DLD	1%-25%	.	.
17	E3/42/2	M	Pre LGM	42	Flaked piece	Flaked p.	Chert	10YR 8/2...	0	14	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
18	E3/42/3	M	Pre LGM	42	Unr/t flake	Prox. flake,no R/t	Chert	10YR 8/2...	0	9	20	2	No	0%	Natural	1	4	N	.	A	.	.		.	.	.
19	E3/41/1	M	Pre LGM	41	Unr/t flake	Comp. flake,no R/t	Chert	5YR 5/2 ...	1	13	12	3	No	0%	Flaked	2	9	N	Plunge	A	.	.		.	.	.
20	E3/41/2	M	Pre LGM	41	Flaked piece	Flaked p.	Chert	10YR 8/2...	1	11	14	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
21	E3/39/1	M	Pre LGM	39	Unr/t flake	Comp. flake,no R/t	Chert	5YR 5/2 ...	12	44	28	8	Yes	26%-50%	Crush...	.	.	N	Feather	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortex_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
22	E3/39/2	M	Pre LGM	39	Unr/t flake	Prox. flake,no R/t	Chert	10YR 8/2...	1	17	20	3	No	0%	Flaked	2	7	N	.	A	.	.		.	.	.
23	E3/39/3	M	Pre LGM	39	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	1	17	15	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
24	E3/36...	M	Pre LGM	3...	Unr/t flake	Prox. flake,no R/t	Chert	10YR 8/2...	17	44	36	9	Yes	1%-25%	Natural	3	18	N	.	A	.	.		.	.	.
25	E3/36...	M	Pre LGM	3...	Flaked piece	Flaked p.	Chert	10YR 5/4...	0	22	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
26	E3/36...	M	Pre LGM	3...	Flaked piece	Flaked p.	Chert	10YR 8/2...	1	13	11	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
27	E3/35/1	M	Pre LGM	35	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	3	21	17	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
28	E4/37.1	C	LGM	37	R/t flake	Comp. flake,R/t	Chert	10YR 8/2...	6	28	23	8	No	0%	Flaked	3	21	N	Feather	P	2	scalar	DLM & DRM	1%-25%	.	.
29	E4/37.1	C	LGM	37	Unid'l core	Unid'l core	Chert	N8 Very l...	10	23	25	16	No	0%	.	.	.	.	.	.	.	.		.	3	4
30	E4/37	C	LGM	37	Unid'l core	Unid'l core	Chert	5YR 6/4 ...	23	29	29	17	Yes	1%-25%	.	.	.	.	.	.	.	.		.	1	1
31	E4/37	C	LGM	37	Unid'l core	Unid'l core	Chert	5YR 6/4 ...	9	38	25	9	Yes	1%-25%	.	.	.	.	.	.	.	.		.	1	1
32	E4/37	C	LGM	37	Flaked piece	Flaked p.	Chert	5YR 6/4 ...	2	40	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
33	E4/37	C	LGM	37	Flaked piece	Flaked p.	Chert	5YR 6/4 ...	1	18	11	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
34	E4/37	C	LGM	37	Flaked piece	Flaked p.	Chert	5YR 6/4 ...	1	22	15	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
35	E4/37	C	LGM	37	Flaked piece	Flaked p.	Chert	5YR 6/4 ...	3	34	20	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
36	E4/37	C	LGM	37	Flaked piece	Flaked p.	Chert	5YR 6/4 ...	1	19	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
37	E4/36	C	LGM	36	Multid'l core	Multid'l core	Calcrete	5YR 6/4 ...	31	49	37	21	No	0%	.	.	.	.	.	.	.	.		.	3	3
38	E4/36	C	LGM	36	Flaked piece	Flaked p.	Calcrete	5YR 6/4 ...	0	9	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
39	E4/36.	C	LGM	36	Flaked piece	Flaked p.	Calcrete	5YR 6/4 ...	0	15	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
40	E4/36	C	LGM	36	Unr/t flake	Prox. flake,no R/t	Calcrete	5YR 6/4 ...	0	7	11	3	No	0%	.	.	.	N	Feather	A	.	.		.	.	.
41	E4/36	C	LGM	36	Scraper flat-e	Comp. flake,R/t	Chert	10YR 6/2...	1	23	6	2	No	0%	Natural	1	2	N	.	P	2	scalar	DLM & distal	1%-25%	.	.
42	E4/36	C	LGM	36	Flaked piece	Flaked p.	Calcrete	5YR 6/4 ...	2	23	14	5	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
43	E4/36	C	LGM	36	Flaked piece	Flaked p.	Calcrete	5YR 6/4 ...	0	19	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
44	E4/36	C	LGM	36	Flaked piece	Flaked p.	Calcrete	5YR 6/4 ...	0	16	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
45	E4/36	C	LGM	36	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	17	12	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
46	E4/36	C	LGM	36	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	20	11	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
47	E4/36	C	LGM	36	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	7	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
48	E4/36	C	LGM	36	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	12	6	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
49	E4/36	C	LGM	36	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
50	E4/36	C	LGM	36	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
51	E4/35.1	C	LGM	35	R/t flake	Comp. flake,R/t	Chert	5YR 5/2 ...	11	34	24	11	Yes	1%-25%	Flaked	3	23	N	Plunge	P	1	scalar	DLM	1%-25%	.	.
52	E4/35	C	LGM	35	Flaked piece	Flaked p.	Chert	5YR 5/2 ...	3	21	20	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
53	E4/35	C	LGM	35	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	3	38	17	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
54	E3/30/2	M	LGM	30	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	7	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
55	E3/29/2	M	LGM	29	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	20	15	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
56	E3/27/1	M	LGM	27	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	13	18	2	No	0%	Natural	2	7	N	Feather	A	.	.		.	.	.
57	E3/26/2	M	LGM	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	25	20	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
58	E3/26/3	M	LGM	26	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	2	14	19	4	Yes	1%-25%	Natural	1	4	N	.	A	.	.		.	.	.
59	E3/26/4	M	LGM	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	26	11	7	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
60	E3/24/1	M	LGM	24	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	1	15	17	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
61	D2/26	C	LGM	26	Flaked piece	Flaked p.	Chert	10YR 6/6...	5	28	20	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
62	D2/26	C	LGM	26	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
63	D2/26	C	LGM	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	4	32	21	7	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
64	D2/26	C	LGM	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	24	19	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
65	D2/23	C	Bw LGM&EH	23	Scraper round-e	Comp. flake,R/t	Chert	10YR 6/2...	4	26	19	7	Yes	1%-25%	Flaked	11	15	N	Step	P	1	serrated	VRP	1%-25%	.	.
66	D2/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/6...	0	25	14	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
67	D2/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/6...	0	20	12	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
68	D2/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/6...	0	19	14	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
69	D2/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	10	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
70	D2/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	0	10	7	3	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
71	D2/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
72	D2/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
73	D2/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	10YR 7/4...	1	22	16	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
74	D2/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chert	10YR 6/6...	8	35	30	6	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
75	D2/20	C	Bw LGM&EH	20	Scraper round-e	Comp. flake,R/t	Chalc...	N8 Very l...	0	12	11	3	Yes	1%-25%	Natural	3	9	N	Feather	P	1	scalar	PM	1%-25%	.	.
76	D2/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	16	12	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
77	D2/20	C	Bw LGM&EH	20	Scraper round-e	Prox. flake,R/t	Chert	10YR 6/2...	1	18	13	3	No	0%	Natural	4	9	N	.	P	2	scalar	DRM & DLM	1%-25%	.	.
78	D2/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	17	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
79	D2/19	C	Bw LGM&EH	19	Scraper flat-e	Prox. flake,R/t	Chert	10YR 6/2...	1	9	14	4	Yes	1%-25%	Cortical	4	9	N	.	P	1	serrated	DLP	1%-25%	.	.
80	D2/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	24	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
81	D2/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	24	7	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
82	D2/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	20	13	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
83	D2/19	C	Bw LGM&EH	19	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	1	15	16	2	No	0%	Natural	2	7	N	.	A	.	.		.	.	.
84	D2/19	C	Bw LGM&EH	19	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	1	9	17	3	No	0%	Natural	3	7	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
85	D2/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	23	16	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
86	D2/19	C	Bw LGM&EH	19	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	10	7	2	No	0%	Natural	3	8	N	Feather	A	.	.		.	.	.
87	D2/18	C	Bw LGM&EH	18	Unid'l core	Unid'l core	Chert	10YR 6/2...	74	68	54	22	No	0%	.	.	.	.	.	.	.	.		.	1	1
88	D2/18	C	Bw LGM&EH	18	Unid'l core	Unid'l core	Chert	5Y 7/2 Y...	9	26	22	7	No	0%	.	.	.	.	.	.	.	.		.	3	2
89	D2/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
90	D2/18	C	Bw LGM&EH	18	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	1	13	11	3	No	0%	Flaked	1	3	N	.	A	.	.		.	.	.
91	D2/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
92	D2/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	16	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
93	D2/18	C	Bw LGM&EH	18	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	6	22	24	8	No	0%	Natural	5	14	N	.	A	.	.		.	.	.
94	D2/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	5	29	17	9	No	0%	.	.	.	N	.	A	.	.		.	.	.
95	D2/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	16	12	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
96	D2/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	18	12	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
97	D2/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	6	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
98	D2/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
99	D2/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chalc...	N2 Greyi...	0	11	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
100	D2/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
101	D2/17	C	Bw LGM&EH	17	Unid'l core	Unid'l core	Chert	10YR 6/2...	7	30	17	9	Yes	1%-25%	.	.	.	.	.	.	.	.		.	2	2
102	D2/17	C	Bw LGM&EH	17	Multid'l core	Multid'l core	Chalc...	10YR 6/2...	23	52	42	13	Yes	1%-25%	.	.	.	.	.	.	.	.		.	2	3
103	D2/17	C	Bw LGM&EH	17	Unid'l core	Unid'l core	Chalc...	5Y 7/2 Y...	5	49	18	7	Yes	1%-25%	.	.	.	.	.	.	.	.		.	2	3
104	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
105	D2/17	C	Bw LGM&EH	17	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	10	9	1	Yes	1%-25%	Cortical	1	3	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortex_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
106	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	0	15	7	1	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
107	D2/17	C	Bw LGM&EH	17	Scraper flat-e	Comp. flake,R/t	Chert	10YR 6/2...	1	32	9	3	No	0%	Natural	1	3	N	Feather	P	1	serrated	DRP	26%-5...	.	.
108	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	4	34	18	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
109	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	17	40	23	14	No	0%	.	.	.	N	.	A	.	.		.	.	.
110	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	22	16	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
111	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	1	27	16	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
112	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	16	11	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
113	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	24	14	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
114	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	29	23	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
115	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	29	14	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
116	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	3	25	23	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
117	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	2	34	14	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
118	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	13	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
119	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	17	11	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
120	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
121	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
122	D2/17	C	Bw LGM&EH	17	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	9	10	2	No	0%	Natural	2	3	N	Feather	A	.	.		.	.	.
123	D2/17	C	Bw LGM&EH	17	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	10	8	2	No	0%	Natural	1	2	N	.	A	.	.		.	.	.
124	D2/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	3	27	19	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
125	D2/17	C	Bw LGM&EH	17	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	0	14	17	3	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
126	D2/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 5/4...	7	34	25	8	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
127	D2/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	20	16	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
128	D2/16	C	Bw LGM&EH	16	Scraper round-e	Prox. flake,R/t	Chert	10YR 6/2...	0	12	16	4	No	0%	Natural	3	8	N	.	P	2	scalar	DRP & DLP	1%-25%	.	.
129	D2/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	17	9	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
130	D2/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	20	10	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
131	D2/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
132	D2/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	12	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
133	D2/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
134	D2/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
135	D2/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
136	D2/15	C	Bw LGM&EH	15	Multid'l core	Multid'l core	Chert	10YR 6/2...	1	19	10	5	No	0%	.	.	.	.	.	.	.	.		.	2	2
137	D2/15	C	Bw LGM&EH	15	Multid'l core	Multid'l core	Chert	10YR 6/2...	1	16	10	4	No	0%	.	.	.	.	.	.	.	.		.	2	3
138	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	31	12	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
139	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	5	34	22	8	No	0%	.	.	.	N	.	A	.	.		.	.	.
140	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	10	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
141	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	5	36	23	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
142	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
143	D2/15	C	Bw LGM&EH	15	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	18	11	4	No	0%	Natural	4	10	N	.	A	.	.		.	.	.
144	D2/15	C	Bw LGM&EH	15	Scraper flat-e	Prox. flake,R/t	Chert	10YR 6/2...	0	16	22	5	No	0%	Flaked	4	8	N	.	P	1	scalar	DRP	1%-25%	.	.
145	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	10	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
146	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
147	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortex_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
148	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 5/4...	0	28	12	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
149	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	0	12	5	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
150	D2/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
151	D2/15	C	Bw LGM&EH	15	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	6	8	1	No	0%	Abraded	1	2	N	Feather	A	.	.		.	.	.
152	D2/14	C	Bw LGM&EH	14	Unid'l core	Unid'l core	Chert	10YR 6/2...	1	18	13	5	No	0%	.	.	.	.	.	.	.	.		.	1	1
153	D2/14	C	Bw LGM&EH	14	Unid'l core	Unid'l core	Chert	10YR 6/2...	2	21	18	9	Yes	1%-25%	.	.	.	.	.	.	.	.		.	2	2
154	D2/14	C	Bw LGM&EH	14	Scraper round-e	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	2	25	19	4	No	0%	Natural	2	7	N	.	P	2	scalar	DM & DRM	1%-25%	.	.
155	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
156	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	22	13	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
157	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	25	15	3	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
158	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	16	12	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
159	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 4/2...	2	24	11	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
160	D2/14	C	Bw LGM&EH	14	R/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	16	10	5	No	0%	Natural	2	9	N	.	A	.	.		.	.	.
161	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	0	20	14	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
162	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
163	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
164	D2/14	C	Bw LGM&EH	14	Scraper flat-e	Comp. flake,R/t	Chert	10YR 6/2...	0	18	14	2	No	0%	Natural	2	10	N	Step	A	1	scalar	DRM	1%-25%	.	.
165	D2/14	C	Bw LGM&EH	14	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	1	24	14	5	No	0%	Natural	5	10	N	Feather	A	.	.		.	.	.
166	D2/14	C	Bw LGM&EH	14	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	1	14	11	2	No	0%	Natural	4	7	N	.	A	.	.		.	.	.
167	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
168	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
169	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
170	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
171	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
172	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
173	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
174	D2/14	C	Bw LGM&EH	14	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	13	7	1	No	0%	Natural	2	6	N	Feather	A	.	.		.	.	.
175	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	18	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
176	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
177	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
178	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	7	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
179	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	5	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
180	D2/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	4	.	No	0%	.	.	.	N	.	A	.	.		.	.	.
181	D2/13	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	18	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
182	D2/13	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	26	13	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
183	D2/13	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	5Y 5/2 Li...	0	19	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
184	D2/13	C	Bw LGM&EH	13	Flaked piece	Flaked p.	Chalc...	5Y 5/2 Li...	0	14	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
185	D2/13	C	Bw LGM&EH	13	Scraper round-e	Comp. flake,R/t	Chert	10YR 6/2...	4	23	25	5	No	0%	Natural	4	8	N	.	P	1	scalar	DLM	1%-25%	.	.
186	D2/13	C	Bw LGM&EH	13	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	4	27	23	5	Yes	1%-25%	Natural	2	9	N	Feather	A	.	.		.	.	.
187	D2/13	C	Bw LGM&EH	13	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	2	31	17	5	No	0%	Natural	2	6	N	Feather	A	.	.		.	.	.
188	D2/13	C	Bw LGM&EH	13	Scraper flat-e	Comp. flake,R/t	Chalc...	10YR 6/2...	2	16	23	4	No	0%	Flaked	4	15	N	.	P	1	scalar	PM	1%-25%	.	.
189	D3/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	10	3	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
190	D3/25	C	Bw LGM&EH	25	Unr/t flake	Comp. flake,no R/t	Calcrete	5YR 4/4 ...	1	16	13	4	No	0%	Natural	3	7	N	Feather	A	.	.		.	.	.
191	D3/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
192	D3/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	1	21	13	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
193	D3/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	0	18	8	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
194	D3/22	C	Bw LGM&EH	22	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	1	19	13	3	Yes	1%-25%	Natural	4	8	N	Step	A	.	.		.	.	.
195	D3/22	C	Bw LGM&EH	22	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	1	22	8	3	No	0%	Flaked	2	4	N	.	A	.	.		.	.	.
196	D3/22	C	Bw LGM&EH	22	Unr/t flake	Prox. flake,no R/t	Chalc...	10YR 6/2...	2	18	19	5	No	0%	Abraded	3	7	N	.	A	.	.		.	.	.
197	D3/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	26	14	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
198	D3/22	C	Bw LGM&EH	22	Scraper round-e	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	3	25	19	4	Yes	1%-25%	Natural	2	5	N	Feather	P	1	serrated	DRP	1%-25%	.	.
199	D3/22	C	Bw LGM&EH	22	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	7	29	22	11	Yes	1%-25%	Natural	2	12	N	Feather	A	.	.		.	.	.
200	D3/22	C	Bw LGM&EH	22	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	3	25	19	.	No	0%	Natural	8	11	N	Feather	A	.	.		.	.	.
201	D3/22	C	Bw LGM&EH	22	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	1	20	16	3	No	0%	Natural	3	7	N	.	A	.	.		.	.	.
202	D3/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	15	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
203	D3/22	C	Bw LGM&EH	22	Unid'l core	Unid'l core	Calcrete	5YR 4/4 ...	28	64	40	11	No	0%	.	.	.	.	.	.	.	.		.	1	1
204	D3/22	C	Bw LGM&EH	22	Unid'l core	Unid'l core	Calcrete	5YR 4/4 ...	188	60	53	51	No	0%	.	.	.	.	.	.	.	.		.	2	2
205	D3/21	C	Bw LGM&EH	21	Unid'l core	Unid'l core	Chalc...	5Y 7/2 Y...	1	26	11	5	Yes	1%-25%	.	.	.	.	.	.	.	.		.	1	1
206	D3/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	31	11	9	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
207	D3/21	C	Bw LGM&EH	21	Scraper round-e	Dist. flake,R/t	Chalc...	5Y 7/2 Y...	1	12	17	6	No	0%	.	.	.	N	Feather	P	1	scalar	DRD	.	.	.
208	D3/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	17	8	4	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
209	D3/21	C	Bw LGM&EH	21	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	13	5	3	No	0%	Natural	1	3	N	Feather	A	.	.		.	.	.
210	D3/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
211	D3/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	7	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
212	D3/20	C	Bw LGM&EH	20	Unid'l core	Unid'l core	Chalc...	5Y 7/2 Y...	2	26	16	4	No	0%	.	.	.	.	.	.	.	.		.	1	1
213	D3/20	C	Bw LGM&EH	20	Multid'l core	Multid'l core	Chalc...	5Y 7/2 Y...	2	22	15	4	No	0%	.	.	.	.	.	.	.	.		.	1	5
214	D3/20	C	Bw LGM&EH	20	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	6	28	23	7	No	0%	Natural	3	11	N	Step	A	.	.		.	.	.
215	D3/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	3	35	11	.	No	0%	.	.	.	N	.	A	.	.		.	.	.
216	D3/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	22	10	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
217	D3/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	15	13	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
218	D3/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	20	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
219	D3/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chert	5B 5/1 M...	0	11	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
220	D3/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chert	5B 5/1 M...	0	11	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
221	D3/20	C	Bw LGM&EH	20	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	1	8	14	3	No	0%	Flaked	1	6	N	.	A	.	.		.	.	.
222	D3/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	15	12	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
223	D3/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	9	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
224	D3/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
225	D3/20	C	Bw LGM&EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	26	17	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
226	D3/20	C	Bw LGM&EH	20	R/t flake	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	1	14	7	4	No	0%	Facett...	5	9	N	Feather	P	1	scalar	DLM	1%-25%	.	.
227	D3/20	C	Bw LGM&EH	20	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	1	12	16	4	No	0%	Flaked	5	9	N	.	A	.	.		.	.	.
228	D3/20	C	Bw LGM&EH	20	Scraper round-e	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	1	14	9	2	No	0%	Natural	1	4	N	Feather	P	1	serrated	DRP	1%-25%	.	.
229	D3/19	C	Bw LGM&EH	19	Multid'l core	Multid'l core	Chert	10YR 6/2...	27	52	28	15	No	0%	.	.	.	.	.	.	.	.		.	4	12
230	D3/19	C	Bw LGM&EH	19	Multid'l core	Multid'l core	Chalc...	5Y 7/2 Y...	2	19	13	6	No	0%	.	.	.	.	.	.	.	.		.	2	3
231	D3/19	C	Bw LGM&EH	19	Multid'l core	Multid'l core	Chalc...	5Y 7/2 Y...	2	24	14	6	No	0%	.	.	.	.	.	.	.	.		.	3	3

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
232	D3/19	C	Bw LGM&EH	19	Multid'l core	Multid'l core	Chalc...	5Y 7/2 Y...	2	28	15	4	No	0%	.	.	.	.	.	.	.	.		.	2	2
233	D3/19	C	Bw LGM&EH	19	Unid'l core	Unid'l core	Chalc...	5Y 7/2 Y...	6	32	23	6	No	0%	.	.	.	.	.	.	.	.		.	3	3
234	D3/19	C	Bw LGM&EH	19	Unid'l core	Unid'l core	Chert	10YR 6/2...	1	22	15	6	No	0%	.	.	.	.	.	.	.	.		.	2	2
235	D3/19	C	Bw LGM&EH	19	Unid'l core	Unid'l core	Calcrete	5YR 4/4 ...	21	40	37	9	Yes	26%-50%	.	.	.	.	.	.	.	.		.	2	2
236	D3/19	C	Bw LGM&EH	19	Multid'l core	Multid'l core	Chert	10YR 6/2...	6	34	16	8	Yes	1%-25%	.	.	.	.	.	.	.	.		.	2	2
237	D3/19	C	Bw LGM&EH	19	Unid'l core	Unid'l core	Calcrete	5YR 4/4 ...	10	37	23	8	No	0%	.	.	.	.	.	.	.	.		.	2	2
238	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	17	11	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
239	D3/19	C	Bw LGM&EH	19	Unr/t flake	Dist. flake,no R/t	Chalc...	5Y 7/2 Y...	1	9	17	4	No	0%	.	.	.	N	Feather	A	.	.		.	.	.
240	D3/19	C	Bw LGM&EH	19	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	0	10	14	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
241	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
242	D3/19	C	Bw LGM&EH	19	Scraper flat-e	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	0	13	11	2	No	0%	Natural	3	4	N	Feather	P	1	scalar	VLM	1%-25%	.	.
243	D3/19	C	Bw LGM&EH	19	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	1	17	11	2	No	0%	Cortical	3	9	N	Feather	A	.	.		.	.	.
244	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	1	19	13	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
245	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	3	21	18	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
246	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	1	21	12	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
247	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	5	28	17	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
248	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	19	13	.	No	0%	.	.	.	N	.	A	.	.		.	.	.
249	D3/19	C	Bw LGM&EH	19	R/t flake	Dist. flake,R/t	Chert	10YR 6/2...	0	6	10	2	No	0%	.	.	.	N	.	P	3	scalar	DM,DRM,DLM	1%-25%	.	.
250	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	1	21	12	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
251	D3/19	C	Bw LGM&EH	19	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	1	16	14	4	No	0%	Natural	4	7	N	.	A	.	.		.	.	.
252	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	0	17	10	4	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
253	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
254	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chalc...	5PB 7/2 ...	0	12	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
255	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chalc...	5PB 7/2 ...	0	10	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
256	D3/18	C	Bw LGM&EH	18	Multid'l core	Multid'l core	Chalc...	10YR 6/2...	3	22	17	6	Yes	1%-25%	.	.	.	.	.	.	.	.		.	2	5
257	D3/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	0	12	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
258	D3/18	C	Bw LGM&EH	18	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	0	18	11	.	No	0%	.	.	.	N	.	A	.	.		.	.	.
259	D3/18	C	Bw LGM&EH	18	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	0	12	15	3	No	0%	Facett...	4	11	N	Feather	A	.	.		.	.	.
260	D3/18	C	Bw LGM&EH	18	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	0	13	14	4	No	0%	Natural	2	7	N	Feather	A	.	.		.	.	.
261	D3/18	C	Bw LGM&EH	18	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	3	34	17	6	No	0%	Flaked	3	5	N	Feather	A	.	.		.	.	.
262	D3/17	C	Bw LGM&EH	17	Unr/t flake	Prox. flake,no R/t	Chalc...	10YR 6/2...	0	8	11	2	No	0%	Natural	1	5	N	.	A	.	.		.	.	.
263	D3/17	C	Bw LGM&EH	17	Unr/t flake	Prox. flake,no R/t	Chalc...	10YR 6/2...	0	11	14	2	No	0%	Natural	3	7	N	.	A	.	.		.	.	.
264	D3/17	C	Bw LGM&EH	17	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	12	9	2	No	0%	Natural	3	8	N	Feather	A	.	.		.	.	.
265	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
266	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	15	7	8	No	0%	.	.	.	N	.	A	.	.		.	.	.
267	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
268	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	20	14	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
269	D3/17	C	Bw LGM&EH	17	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	0	17	12	2	No	0%	Flaked	3	7	N	Feather	A	.	.		.	.	.
270	D3/17	C	Bw LGM&EH	17	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	7	19	37	7	Yes	1%-25%	Natural	7	28	N	Feather	A	.	.		.	.	.
271	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	3	40	14	5	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
272	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	22	14	2	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
273	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	12	3	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
274	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	20	12	3	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
275	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	12	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
276	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	19	11	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
277	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	9	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
278	D3/17	C	Bw LGM&EH	17	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	0	11	7	1	No	0%	Natural	1	4	N	Feather	A	.	.		.	.	.
279	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chalc...	5PB 7/2 ...	0	12	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
280	D3/17	C	Bw LGM&EH	17	Flaked piece	Flaked p.	Chalc...	5PB 7/2 ...	0	10	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
281	D3/16	C	Bw LGM&EH	16	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/6...	0	7	7	2	No	0%	Natural	2	6	N	Feather	A	.	.		.	.	.
282	D3/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chalc...	N8 Very l...	0	10	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
283	D3/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
284	D3/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
285	D3/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
286	D3/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	18	17	6	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
287	D3/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	11	6	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
288	D3/16	C	Bw LGM&EH	16	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	14	13	2	No	0%	Natural	2	7	N	Feather	A	.	.		.	.	.
289	D3/16	C	Bw LGM&EH	16	Scraper round-e	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	0	13	13	2	No	0%	Natural	2	4	N	Feather	P	1	serrated	VLP	1%-25%	.	.
290	D3/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	25	14	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
291	D3/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	25	24	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
292	D3/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	5PB 7/2 ...	3	27	17	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
293	D3/16	C	Bw LGM&EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
294	D3/15	C	Bw LGM&EH	15	Multid'l core	Multid'l core	Chert	10YR 6/2...	2	25	9	7	No	0%	.	.	.	.	.	.	.	.		.	2	4

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
295	D3/15	C	Bw LGM&EH	15	Unid'l core	Unid'l core	Chert	10YR 6/2...	7	39	29	6	No	0%	.	.	.	.	.	.	.	.		.	1	1
296	D3/15	C	Bw LGM&EH	15	Unid'l core	Unid'l core	Chalc...	5Y 7/2 Y...	2	25	16	4	No	0%	.	.	.	.	.	.	.	.		.	1	1
297	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	N5 Mediu...	1	26	15	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
298	D3/15	C	Bw LGM&EH	15	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	1	14	14	5	Yes	26%-50%	Natural	3	9	N	.	A	.	.		.	.	.
299	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
300	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	28	8	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
301	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	19	9	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
302	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	3	21	18	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
303	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
304	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
305	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
306	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
307	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
308	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
309	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	0	9	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
310	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
311	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
312	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
313	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5PB 7/2 ...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
314	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
315	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	13	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Context_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
316	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	25	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
317	D3/15	C	Bw LGM&EH	15	Scraper round-e	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	0	15	11	2	Yes	1%-25%	Natural	1	4	N	Feather	P	1	scalar	DLM	1%-25%	.	.
318	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	16	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
319	D3/15	C	Bw LGM&EH	15	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	18	15	3	No	0%	Natural	4	12	N	.	A	.	.		.	.	.
320	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5PB 7/2 ...	0	9	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
321	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
322	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
323	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
324	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
325	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	7	1	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
326	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	N8 Very l...	0	10	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
327	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	7	6	1	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
328	D3/15	C	Bw LGM&EH	15	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	7	1	Yes	0%	.	.	.	N	.	A	.	.		.	.	.
329	D3/14	C	Bw LGM&EH	14	Multid'l core	Multid'l core	Chert	10YR 6/2...	22	37	32	15	No	0%	.	.	.	.	.	.	.	.		.	7	7
330	D3/14	C	Bw LGM&EH	14	Unid'l core	Unid'l core	Chert	10YR 6/2...	5	36	15	10	No	0%	.	.	.	.	.	.	.	.		.	3	4
331	D3/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
332	D3/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5YR 6/4 ...	0	10	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
333	D3/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	7	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
334	D3/14	C	Bw LGM&EH	14	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	7	10	2	No	0%	Natural	2	4	N	Feather	A	.	.		.	.	.
335	D3/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	N5 Mediu...	3	27	16	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
336	D3/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	21	12	5	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
337	D3/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chert	5PB 7/2 ...	0	12	10	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
338	D3/14	C	Bw LGM&EH	14	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	1	16	13	3	No	0%	Natural	5	9	N	Feather	A	.	.		.	.	.
339	D3/14	C	Bw LGM&EH	14	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	11	46	50	5	Yes	1%-25%	Flaked	3	11	N	Hinge	A	.	.		.	.	.
340	D3/14	C	Bw LGM&EH	14	Scraper round-e	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	2	22	17	3	Yes	26%-50%	Crush...	.	.	N	Feather	P	1	scalar	DLM	1%-25%	.	.
341	D3/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
342	D3/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	15	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
343	D3/14	C	Bw LGM&EH	14	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
344	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	10	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
345	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	23	14	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
346	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chalc...	5YR 2/2 ...	2	21	12	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
347	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	21	14	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
348	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chert	5YR 6/4 ...	1	16	13	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
349	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chert	5YR 6/4 ...	0	16	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
350	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
351	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chert	10YR 6/2...	4	33	15	8	No	0%	.	.	.	N	.	A	.	.		.	.	.
352	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
353	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	7	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
354	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	0	17	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
355	E3/23/1	M	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	4	27	16	7	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
356	E3/22/1	M	Bw LGM&EH	22	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	4	31	22	6	No	0%	Abraded	7	10	N	Feather	A	.	.		.	.	.
357	E3/21/9	M	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	19	10	3	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
358	E3/21/8	M	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	15	11	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
359	E3/21/7	M	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	15	14	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
360	E3/21/6	M	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	25	18	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
361	E3/21/5	M	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	23	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
362	E3/21/3	M	Bw LGM&EH	21	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	1	16	20	5	Yes	1%-25%	Natural	4	9	N	.	A	.	.		.	.	.
363	E3/21/2	M	Bw LGM&EH	21	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	4	19	21	6	No	0%	Natural	3	10	N	.	A	.	.		.	.	.
364	E3/20/1	M	Bw LGM&EH	20	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	11	19	33	19	Yes	1%-25%	Natural	1	5	N	.	A	.	.		.	.	.
365	E3/19/1	M	Bw LGM&EH	19	Unid'l core	Unid'l core	Chert	10YR 6/2...	28	52	39	13	No	0%	.	.	.	.	.	.	.	.		.	2	2
366	E3/19/2	M	Bw LGM&EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	13	11	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
367	E3/19/3	M	Bw LGM&EH	19	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	1	15	11	3	No	0%	Natural	5	11	N	.	A	.	.		.	.	.
368	E3/18/1	M	Bw LGM&EH	18	Flaked piece	Flaked p.	Chert	5Y 5/2 Li...	22	48	32	12	No	0%	.	.	.	N	.	A	.	.		.	.	.
369	E3/18/2	M	Bw LGM&EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	6	33	19	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
370	E4/34/3	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chert	10YR 7/4...	11	40	24	9	No	0%	.	.	.	N	.	A	.	.		.	.	.
371	E4/34	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	0	10	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
372	E4/33.	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chert	10YR 7/4...	0	15	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
373	E4/33..	C	Bw LGM&EH	34	Flaked piece	Flaked p.	Chert	10YR 7/4...	0	10	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
374	E4/33	C	Bw LGM&EH	33	Scraper flat-e	Comp. flake,R/t	Chert	5Y 7/2 Y...	0	9	13	3	No	0%	Natural	3	16	N	.	P	1	serrated	DM	1%-25%	.	.
375	E4/33	C	Bw LGM&EH	33	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	0	18	13	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
376	E4/32	C	Bw LGM&EH	32	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	22	13	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
377	E4/32	C	Bw LGM&EH	32	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	17	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
378	E4/32	C	Bw LGM&EH	32	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	1	25	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortex_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
379	E4/32	C	Bw LGM&EH	32	Unid'l core	Unid'l core	Chert	10YR 6/2...	35	41	34	14	Yes	26%-50%	.	.	.	.	.	.	.	.		.	1	1
380	E4/31	C	Bw LGM&EH	31	Flaked piece	Flaked p.	Chert	10YR 7/4...	0	10	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
381	E4/31	C	Bw LGM&EH	31	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	28	12	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
382	E4/31	C	Bw LGM&EH	31	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	1	27	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
383	E4/31	C	Bw LGM&EH	31	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	0	16	13	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
384	E4/30	C	Bw LGM&EH	30	Multid'l core	Multid'l core	Chalc...	5Y 7/2 Y...	8	50	20	10	No	0%	.	.	.	.	.	.	.	.		.	4	6
385	E4/30	C	Bw LGM&EH	30	Unr/t flake	Prox. flake,no R/t	Chert	5YR 4/4 ...	7	24	23	11	No	0%	Natural	6	15	N	.	A	.	.		.	.	.
386	E4/30	C	Bw LGM&EH	30	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	3	25	19	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
387	E4/30	C	Bw LGM&EH	30	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	12	8	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
388	E4/30	C	Bw LGM&EH	30	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	13	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
389	E4/30	C	Bw LGM&EH	30	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	1	12	8	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
390	E4/29	C	Bw LGM&EH	29	Flaked piece	Flaked p.	Chert	10YR 7/4...	0	12	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
391	E4/29.	C	Bw LGM&EH	29	Flaked piece	Flaked p.	Chert	10YR 7/4...	0	8	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
392	E4/29	C	Bw LGM&EH	29	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	16	39	38	9	No	0%	Facett...	13	32	N	Feather	A	.	.		.	.	.
393	E4/29	C	Bw LGM&EH	29	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	4	31	19	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
394	E4/29	C	Bw LGM&EH	29	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	0	13	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
395	E4/29	C	Bw LGM&EH	29	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	20	8	9	No	0%	.	.	.	N	.	A	.	.		.	.	.
396	E4/28	C	Bw LGM&EH	28	Flaked piece	Flaked p.	Chert	10YR 7/4...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
397	E4/28.	C	Bw LGM&EH	28	Flaked piece	Flaked p.	Chert	10YR 7/4...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
398	E4/28	C	Bw LGM&EH	28	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	13	24	13	7	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
399	E4/28	C	Bw LGM&EH	28	Multid'l core	Multid'l core	Chert	5YR 4/4 ...	135	56	47	31	No	0%	.	.	.	.	.	.	.	.		.	3	3

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
400	E4/28	C	Bw LGM&EH	28	Multid'l core	Multid'l core	Chert	5YR 4/4 ...	6	37	18	9	No	0%	.	.	.	.	.	.	.	.		.	3	5
401	E4/27	C	Bw LGM&EH	27	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
402	E4/27	C	Bw LGM&EH	27	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
403	E4/27	C	Bw LGM&EH	27	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	1	17	17	3	No	0%	Natural	2	4	N	Step	A	.	.		.	.	.
404	E4/27	C	Bw LGM&EH	27	Unid'l core	Unid'l core	Chert	5Y 7/2 Y...	7	40	21	8	No	0%	.	.	.	.	.	.	.	.		.	2	2
405	E4/26	C	Bw LGM&EH	26	Multid'l core	Multid'l core	Chalc...	5Y 7/2 Y...	6	27	19	10	Yes	1%-25%	.	.	.	.	.	.	.	.		.	3	3
406	E4/26	C	Bw LGM&EH	26	Unid'l core	Unid'l core	Chert	5YR 4/4 ...	1	26	13	5	Yes	1%-25%	.	.	.	.	.	.	.	.		.	1	1
407	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	1	20	14	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
408	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	1	19	11	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
409	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	4	27	16	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
410	E4/26	C	Bw LGM&EH	26	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	1	19	13	4	No	0%	Natural	1	4	N	Feather	A	.	.		.	.	.
411	E4/26	C	Bw LGM&EH	26	Scraper flat-e	Prox. flake,R/t	Chalc...	5Y 7/2 Y...	1	20	20	5	No	0%	Natural	8	12	N	.	P	2	scalar	DLM & DRM	1%-25%	.	.
412	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	0	12	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
413	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
414	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
415	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
416	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
417	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
418	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
419	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
420	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	17	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
421	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	25	5	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
422	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	7	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
423	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
424	E4/26	C	Bw LGM&EH	26	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	3	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
425	E4/25	C	Bw LGM&EH	25	Unid'l core	Unid'l core	Calcrete	5YR 4/4 ...	13	30	25	13	No	0%	.	.	.	.	.	.	.	.		.	1	1
426	E4/25	C	Bw LGM&EH	25	Unid'l core	Unid'l core	Calcrete	5YR 4/4 ...	17	32	25	15	No	0%	.	.	.	.	.	.	.	.		.	2	2
427	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
428	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
429	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
430	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
431	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
432	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
433	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	5	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
434	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
435	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
436	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
437	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
438	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
439	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
440	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	4	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
441	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	2	1	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
442	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
443	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
444	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
445	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
446	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
447	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	28	23	10	No	0%	.	.	.	N	.	A	.	.		.	.	.
448	E4/25	C	Bw LGM&EH	25	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	0	19	11	5	No	0%	Crush...	.	.	N	.	A	.	.		.	.	.
449	E4/25	C	Bw LGM&EH	25	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	2	24	16	4	No	0%	Abraded	4	14	N	.	A	.	.		.	.	.
450	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	1	39	9	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
451	E4/25	C	Bw LGM&EH	25	Scraper flat-e	Comp. flake,R/t	Chert	10YR 6/2...	10	33	23	12	Yes	1%-25%	Flaked	8	16	N	Feather	P	1	scalar	DRP	1%-25%	.	.
452	E4/25	C	Bw LGM&EH	25	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	16	10	3	No	0%	Natural	4	8	N	Plunge	A	.	.		.	.	.
453	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	13	12	4	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
454	E4/25	C	Bw LGM&EH	25	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	5	23	30	6	No	0%	Natural	4	20	N	.	A	.	.		.	.	.
455	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	18	12	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
456	E4/25	C	Bw LGM&EH	25	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	1	16	20	2	Yes	1%-25%	Natural	3	9	N	.	A	.	.		.	.	.
457	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	22	18	4	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
458	E4/25	C	Bw LGM&EH	25	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
459	E4/25	C	Bw LGM&EH	25	Scraper flat-e	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	40	59	36	12	Yes	1%-25%	Indete...	.	.	N	Hinge	P	2	steep	DLM & PM	1%-25%	.	.
460	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
461	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
462	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	5	3	2	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Context_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
463	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
464	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
465	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	5	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
466	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
467	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
468	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
469	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
470	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
471	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
472	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	5	4	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
473	E4/24/2	C	Bw LGM&EH	24	R/t flake	Dist. flake,R/t	Chert	10YR 6/2...	8	18	28	12	Yes	1%-25%	.	.	.	N	Feather	P	2	scalar	VLM & VDM	1%-25%	.	.
474	E4/24	C	Bw LGM&EH	24	R/t flake	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	0	17	7	3	No	0%	Natural	2	6	N	Feather	P	2	steep	DRM & DLM	51%-7...	.	.
475	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	20	9	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
476	E4/24	C	Bw LGM&EH	24	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	16	12	2	No	0%	Natural	3	6	N	Feather	A	.	.		.	.	.
477	E4/24	C	Bw LGM&EH	24	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	17	11	4	Yes	26%-50%	Natural	1	3	N	Feather	A	.	.		.	.	.
478	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	15	15	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
479	E4/24	C	Bw LGM&EH	24	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	3	20	14	5	No	0%	Cortical	8	16	N	Feather	A	.	.		.	.	.
480	E4/24	C	Bw LGM&EH	24	Scraper flat-e	Med.flake,R/t	Chalc...	5Y 7/2 Y...	1	16	10	5	No	0%	.	.	.	N	.	P	3	serrated	PM,DM,DRM	1%-25%	.	.
481	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	9	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
482	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	21	13	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
483	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	15	5	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
484	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
485	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	2	19	13	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
486	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	0	15	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
487	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	1	17	10	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
488	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	1	20	11	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
489	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Calcrete	5yr 2/2 D...	0	13	3	2	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
490	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	3	22	18	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
491	E4/24	C	Bw LGM&EH	24	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	1	18	12	2	No	0%	Natural	5	10	N	Hinge	A	.	.		.	.	.
492	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	8	28	23	12	No	0%	.	.	.	N	.	A	.	.		.	.	.
493	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	1	20	12	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
494	E4/24	C	Bw LGM&EH	24	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	1	20	15	4	No	0%	Natural	1	2	N	Hinge	A	.	.		.	.	.
495	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	3	30	23	7	Yes	76%-99%	.	.	.	N	.	A	.	.		.	.	.
496	E4/24	C	Bw LGM&EH	24	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	0	13	8	3	No	0%	Natural	3	7	N	.	A	.	.		.	.	.
497	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
498	E4/24	C	Bw LGM&EH	24	Unr/t flake	Comp. flake,no R/t	Chert	5Y 7/2 Y...	0	10	6	2	No	0%	Flaked	2	7	N	.	A	.	.		.	.	.
499	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	10	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
500	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	0	13	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
501	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	0	17	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
502	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	5Y 5/2 Li...	0	14	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
503	E4/24	C	Bw LGM&EH	24	Scraper steep-e	Comp. flake,R/t	Chert	5PB 7/2 ...	56	68	37	16	No	0%	Natural	9	23	N	Feather	P	2	scalar	DRM & DLM	1%-25%	.	.
504	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	1	22	8	7	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
505	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
506	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
507	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
508	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
509	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
510	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
511	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
512	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
513	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
514	E4/24	C	Bw LGM&EH	24	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
515	E4/24	C	Bw LGM&EH	24	Multid'l core	Multid'l core	Chert	10YR 6/2...	38	47	42	21	No	1%-25%	.	.	.	.	.	.	.	.		.	3	3
516	E4/24	C	Bw LGM&EH	24	Multid'l core	Multid'l core	Calcrete	5YR 4/4 ...	28	32	31	20	No	1%-25%	.	.	.	.	.	.	.	.		.	3	3
517	E4/24	C	Bw LGM&EH	24	Unid'l core	Unid'l core	Calcrete	5YR 4/4 ...	7	34	14	10	No	1%-25%	.	.	.	.	.	.	.	.		.	1	1
518	E4/24	C	Bw LGM&EH	24	Multid'l core	Multid'l core	Chert	10YR 6/2...	0	18	7	6	No	1%-25%	.	.	.	.	.	.	.	.		.	2	3
519	E4/23	C	Bw LGM&EH	23	Unid'l core	Unid'l core	Chalc...	5Y 7/2 Y...	2	24	17	4	No	0%	.	.	.	.	.	.	.	.		.	1	2
520	E4/23	C	Bw LGM&EH	23	Unid'l core	Unid'l core	Calcrete	5YR 4/4 ...	32	46	22	21	No	0%	.	.	.	.	.	.	.	.		.	1	2
521	E4/23	C	Bw LGM&EH	23	Unid'l core	Unid'l core	Calcrete	5YR 4/4 ...	19	32	29	17	Yes	1%-25%	.	.	.	.	.	.	.	.		.	1	1
522	E4/23	C	Bw LGM&EH	23	Multid'l core	Multid'l core	Chalc...	5Y 7/2 Y...	13	32	21	13	No	0%	.	.	.	.	.	.	.	.		.	2	9
523	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
524	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
525	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
526	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
527	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
528	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
529	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
530	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
531	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
532	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	7	1	No	0%	.	.	.	N	5	A	.	.		.	.	.
533	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	0	13	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
534	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	0	17	10	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
535	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	1	19	11	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
536	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	1	23	15	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
537	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	0	21	12	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
538	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	1	19	10	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
539	E4/23	C	Bw LGM&EH	23	Unr/t flake	Prox. flake,no R/t	Chalc...	N8 Very l...	0	9	15	3	No	0%	Natural	2	8	N	.	A	.	.		.	.	.
540	E4/23	C	Bw LGM&EH	23	R/t flake	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	0	15	11	3	No	0%	Natural	4	7	N	Feather	P	2	steep	DRM & DLP	26%-5...	.	.
541	E4/23	C	Bw LGM&EH	23	R/t flake	Comp. flake,R/t	Chalc...	10YR 6/2...	0	17	8	3	No	0%	Natural	5	9	N	Feather	P	2	scalar	DRM & PM	1%-25%	.	.
542	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	0	14	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
543	E4/23	C	Bw LGM&EH	23	Scraper flat-e	Comp. flake,R/t	Chalc...	10YR 6/2...	3	22	23	4	Yes	1%-25%	Natural	5	13	N	Feather	P	1	scalar	DRP	1%-25%	.	.
544	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	11	36	29	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
545	E4/23	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	11	2	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
546	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
547	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	11	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
548	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
549	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
550	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
551	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
552	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
553	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
554	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	6	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
555	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
556	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
557	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
558	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
559	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
560	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
561	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	3	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
562	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
563	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
564	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
565	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
566	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	21	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
567	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortex_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
568	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
569	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
570	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
571	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
572	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
573	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	6	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
574	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
575	E4/22	C	Bw LGM&EH	22	Flaked piece	Dist. flake,R/t	Chert	10YR 6/2...	8	36	20	10	No	0%	.	.	.	N	5	A	.	.		.	.	.
576	E4/22	C	Bw LGM&EH	22	Scraper flat-e	Comp. flake,R/t	Chert	5Y 7/2 Y...	23	45	31	16	No	0%	Natural	4	17	N	Step	P	2	scalar	DRM & DRP	1%-25%	.	.
577	E4/22	C	Bw LGM&EH	22	Unr/t flake	Comp. flake,no R/t	Chert	10YR 7/4...	0	10	8	3	No	0%	Flaked	1	5	N	Feather	A	.	.		.	.	.
578	E4/22	C	Bw LGM&EH	22	R/t flake	Comp. flake,R/t	Chert	10YR 6/2...	4	27	17	7	Yes	51%-75%	Natural	3	19	N	Feather	P	1	scalar	PM	1%-25%	.	.
579	E4/22	C	Bw LGM&EH	22	Scraper round-e	Comp. flake,R/t	Chert	5Y 7/2 Y...	2	21	24	5	Yes	1%-25%	Natural	3	11	N	Feather	P	3	serrated	VRM,VLM,VDM	1%-25%	.	.
580	E4/22	C	Bw LGM&EH	22	Scraper round-e	Prox. flake,R/t	Chert	10YR 7/4...	4	28	21	5	No	0%	Flaked	2	15	N	.	P	2	serrated	VRM,VLM	1%-25%	.	.
581	E4/22	C	Bw LGM&EH	22	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	3	26	14	4	No	0%	Natural	2	14	N	Feather	A	.	.		.	.	.
582	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	10	44	27	9	No	0%	.	.	.	N	.	A	.	.		.	.	.
583	E4/22	C	Bw LGM&EH	22	Scraper round-e	Comp. flake,R/t	Chert	10YR 6/2...	0	11	10	2	No	0%	Natural	1	5	N	Feather	P	2	scalar	DLM,DRM	1%-25%	.	.
584	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	3	27	18	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
585	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	22	13	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
586	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	5	32	19	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
587	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Calcrete	5YR 4/4 ...	26	59	34	8	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
588	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 7/4...	10	38	27	7	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
589	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 7/4...	2	29	22	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
590	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Calcrete	5YR 3/4 ...	9	37	23	10	No	0%	.	.	.	N	.	A	.	.		.	.	.
591	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	28	16	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
592	E4/22	C	Bw LGM&EH	22	R/t flake	Prox. flake,R/t	Chert	10YR 7/4...	0	15	13	4	No	0%	Abraded	2	10	N	.	P	1	serrated	VLM	1%-25%	.	.
593	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 7/4...	11	44	25	9	No	0%	.	.	.	N	.	A	.	.		.	.	.
594	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	17	11	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
595	E4/22	C	Bw LGM&EH	22	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	0	16	19	3	No	0%	Abraded	1	9	N	.	A	.	.		.	.	.
596	E4/22	C	Bw LGM&EH	22	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	23	13	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
597	E4/22	C	Bw LGM&EH	22	R/t flake	Prox. flake,R/t	Chert	10YR 6/2...	0	6	17	4	Yes	51%-75%	Cortical	1	7	N	.	P	1	scalar	VRP	1%-25%	.	.
598	E4/21	C	Bw LGM&EH	21	Unr/t flake	Comp. flake,no R/t	Chert	5Y 7/2 Y...	2	33	15	5	Yes	1%-25%	Flaked	2	7	N	Feather	A	0	.		.	.	.
599	E4/21	C	Bw LGM&EH	21	Scraper flat-e	Comp. flake,R/t	Chert	10YR 7/4...	8	30	28	7	No	0%	Crush...	.	.	N	Feather	P	1	serrated	VRD	1%-25%	.	.
600	E4/21	C	Bw LGM&EH	21	Scraper round-e	Comp. flake,R/t	Chert	5Y 7/2 Y...	0	16	9	4	No	0%	Natural	2	8	N	Feather	P	1	serrated	VRD	1%-25%	.	.
601	E4/21	C	Bw LGM&EH	21	Unr/t flake	Prox. flake,no R/t	Chert	5Y 7/2 Y...	0	14	11	2	No	0%	Natural	2	8	N	Feather	A	.	.		.	.	.
602	E4/21	C	Bw LGM&EH	21	Scraper round-e	Med.flake,R/t	Chert	10YR 6/2...	0	11	17	3	No	0%	.	.	.	N	.	P	1	serrated	VRM	1%-25%	.	.
603	E4/21	C	Bw LGM&EH	21	Scraper round-e	Dist. flake,R/t	Chert	10YR 6/2...	0	14	12	4	No	0%	.	.	.	N	Feather	P	1	serrated	DLM	1%-25%	.	.
604	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Silicifi...	5YR 4/4 ...	0	13	10	8	No	0%	.	.	.	N	.	A	.	.		.	.	.
605	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	13	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
606	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	9	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
607	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	16	12	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
608	E4/21	C	Bw LGM&EH	21	Unr/t flake	Med. flake,no R/t	Chert	5Y 7/2 Y...	0	6	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
609	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	10	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
610	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	10	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
611	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	10	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
612	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	6	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
613	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	12	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
614	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	12	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
615	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
616	E4/21	C	Bw LGM&EH	21	Scraper round-e	Comp. flake,R/t	Chert	5Y 7/2 Y...	0	12	6	3	No	0%	Natural	1	3	N	Feather	P	1	serrated	DLM	26%-5...	.	.
617	E4/21	C	Bw LGM&EH	21	Unr/t flake	Comp. flake,R/t	Chert	5Y 7/2 Y...	0	11	7	3	No	0%	Crush...	.	.	N	Feather	P	2	serrated	VLP & VRP	1%-25%	.	.
618	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	6	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
619	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	12	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
620	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	11	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
621	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	11	3	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
622	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	10	8	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
623	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	12	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
624	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	8	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
625	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	9	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
626	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	7	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
627	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	7	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
628	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	8	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
629	E4/21	C	Bw LGM&EH	21	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
630	D3/25.1	C	Bw LGM&EH	25	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	3	24	16	5	No	0%	Natural	7	11	N	Feather	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
631	D3/23.1	C	Bw LGM&EH	23	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	1	25	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
632	D3/23.2	C	Bw LGM&EH	23	Flaked piece	Flaked p.	Chert	10YR 6/2...	6	28	25	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
633	D3/23.3	C	Bw LGM&EH	23	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	1	16	12	4	No	0%	Facett...	6	14	N	Feather	A	.	.		.	.	.
634	D3/19	C	Bw LGM&EH	19	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	0	12	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
635	D3/17	C	Bw LGM&EH	17	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	7	33	20	8	No	0%	Facett...	9	19	N	Hinge	A	.	.		.	.	.
636	D3/15	C	Bw LGM&EH	15	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	1	24	15	3	No	0%	Natural	2	10	N	Feather	A	.	.		.	.	.
637	D3/13	C	EH	13	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
638	D3/13	C	EH	13	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
639	D3/13	C	EH	13	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	6	3	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
640	D3/13	C	EH	13	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
641	D3/12	C	EH	12	Multid'l core	Multid'l core	Chert	10YR 6/2...	7	43	23	6	No	0%	.	.	.	.	.	.	.	.		.	4	4
642	D3/11	C	EH	11	Multid'l core	Multid'l core	Chert	10YR 6/2...	0	14	6	5	No	0%	.	.	.	.	.	.	.	.		.	3	4
643	D3/11	C	EH	11	Multid'l core	Multid'l core	Chert	10YR 6/2...	12	27	25	16	No	0%	.	.	.	.	.	.	.	.		.	3	7
644	D3/10	C	EH	10	Multid'l core	Multid'l core	Chalc...	5Y 7/2 Y...	2	15	14	7	Yes	1%-25%	.	.	.	.	.	.	.	.		.	3	4
645	D2/12	C	EH	12	Unid'l core	Unid'l core	Chert	5Y 7/2 Y...	21	46	33	11	Yes	1%-25%	.	.	.	.	.	.	.	.		.	3	2
646	D2/12	C	EH	12	Multid'l core	Multid'l core	Chert	5Y 7/2 Y...	19	35	28	19	Yes	1%-25%	.	.	.	.	.	.	.	.		.	5	7
647	D2/12	C	EH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	21	13	3	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
648	D2/12	C	EH	12	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	3	24	6	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
649	D2/12	C	EH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	3	26	11	4	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
650	D2/12	C	EH	12	Flaked piece	Flaked p.	Chert	10YR 5/4...	1	24	10	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
651	D2/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	20	12	3	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
652	D2/12	C	EH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
653	D2/12	C	EH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	4	1	No	0%	Facett...	1	3	N	.	A	.	.		.	.	.
654	D2/12	C	EH	12	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	4	34	20	3	No	0%	Facett...	5	14	N	Feather	A	.	.		.	.	.
655	D2/12	C	EH	12	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	0	7	8	2	No	0%	Natural	2	9	N	Feather	A	.	.		.	.	.
656	D2/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
657	D2/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
658	D2/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
659	D2/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	4	2	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
660	D2/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
661	D2/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
662	D2/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	3	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
663	D2/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
664	D2/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
665	D2/12	C	EH	12	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	8	8	2	No	0%	Natural	2	5	N	.	A	.	.		.	.	.
666	D2/12	C	EH	12	Flaked piece	Flaked p.	Chert	5YR 4/4 ...	5	29	23	4	No	0%	.	.	.	N	Feather	A	.	.		.	.	.
667	D2/12	C	EH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	17	10	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
668	D3/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	6	5	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
669	D3/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	7	7	2	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
670	D3/12	C	EH	12	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	10	6	1	No	0%	Natural	1	6	N	Feather	A	.	.		.	.	.
671	D3/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
672	D3/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
673	D3/12	C	EH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	7	4	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
674	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	6	1	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
675	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
676	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
677	D3/11	C	EH	11	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	1	22	13	5	No	0%	Facett...	7	9	N	Feather	A	.	.		.	.	.
678	D3/11	C	EH	11	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	1	26	11	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
679	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
680	D3/11	C	EH	11	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	1	22	15	2	Yes	26%-50%	Abraded	3	8	N	Feather	A	.	.		.	.	.
681	D3/11	C	EH	11	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 7/4...	0	16	15	5	Yes	51%-75%	Natural	1	2	N	Hinge	A	.	.		.	.	.
682	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	2	22	10	6	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
683	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	2	15	8	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
684	D3/11	C	EH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	10	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
685	D3/11	C	EH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	26	18	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
686	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	16	9	.	No	0%	.	.	.	N	.	A	.	.		.	.	.
687	D3/11	C	EH	11	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	9	32	31	6	Yes	1%-25%	Natural	6	23	N	Feather	A	.	.		.	.	.
688	D3/11	C	EH	11	Flaked piece	Flaked p.	Chert	N8 White	0	11	10	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
689	D3/11	C	EH	11	Flaked piece	Flaked p.	Chert	N8 White	0	8	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
690	D3/11	C	EH	11	Flaked piece	Flaked p.	Chert	N8 White	0	9	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
691	D3/11	C	EH	11	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	9	7	2	No	0%	Natural	4	2	N	Feather	A	.	.		.	.	.
692	D3/11	C	EH	11	Scraper round-e	Comp. flake,R/t	Chalc...	10YR 6/2...	0	9	10	3	No	0%	Natural	4	6	N	Feather	P	2	steep	DRM VLM	1%-25%	.	.
693	D3/11	C	EH	11	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	10	8	1	No	0%	Crush...	.	.	N	Feather	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
694	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
695	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	16	6	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
696	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
697	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	7	1	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
698	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
699	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
700	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	17	4	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
701	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
702	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
703	D3/11	C	EH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	8	1	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
704	D3/11	C	EH	11	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	15	14	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
705	D3/11	C	EH	11	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	16	14	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
706	D3/11	C	EH	11	Scraper round-e	Prox. flake,R/t	Chalc...	5Y 7/2 Y...	0	11	8	2	No	0%	Natural	3	5	N	.	P	1	scalar	DRM	.	.	.
707	D3/11	C	EH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	8	6	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
708	D3/10	C	EH	10	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	0	9	10	2	No	0%	Natural	1	5	N	Feather	A	.	.		.	.	.
709	D3/10	C	EH	10	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
710	D3/10	C	EH	10	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	6	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
711	D3/10	C	EH	10	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
712	D3/10	C	EH	10	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	6	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
713	D3/10	C	EH	10	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	4	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
714	D3/10	C	EH	10	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
715	D3/10	C	EH	10	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
716	E4/20	C	EH	20	Scraper flat-e	Dist. flake,R/t	Chert	10YR 6/2...	4	26	18	8	No	0%	.	.	.	N	Feather	P	1	scalar	VRM	1%-25%	.	.
717	E4/20	C	EH	20	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	5	22	18	5	No	0%	Abraded	3	18	N	.	A	.	.		.	.	.
718	E4/20	C	EH	20	Unr/t flake	Med. flake,no R/t	Chert	5PB 7/2 ...	2	22	16	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
719	E4/20	C	EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	16	5	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
720	E4/20	C	EH	20	Flaked piece	Flaked p.	Chert	10YR 4/2...	0	10	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
721	E4/20	C	EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
722	E4/20	C	EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
723	E4/20	C	EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
724	E4/20	C	EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
725	E4/20	C	EH	20	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
726	E4/19.1	C	EH	19	R/t flake	Comp. flake,R/t	Chert	10YR 6/2...	22	57	30	10	No	0%	Flaked	3	12	N	Feather	P	3	scalar...	VLM,PM,VRD	1%-25%	.	.
727	E4/19	C	EH	19	Unr/t flake	Med. flake,no R/t	Chert	10YR 6/2...	4	21	34	4	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
728	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	17	11	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
729	E4/19	C	EH	19	Flaked piece	Med. flake,no R/t	Chert	10YR 6/2...	0	25	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
730	E4/19	C	EH	19	Scraper flat-e	Prox. flake,R/t	Chert	5YR 2/2 ...	3	16	28	4	No	0%	Flaked	4	15	N	.	P	1	scalar	VLM	1%-25%	.	.
731	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	25	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
732	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	12	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
733	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
734	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
735	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
736	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
737	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
738	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	5	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
739	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	7	3	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
740	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	10	1	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
741	E4/19	C	EH	19	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	12	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
742	E4/19	C	EH	19	Scraper flat-e	Comp. flake,R/t	Chert	5PB 7/2 ...	0	15	8	4	No	0%	Natural	1	8	N	Feather	P	1	serrated	VLP	1%-25%	.	.
743	E4/18.1	C	EH	18	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
744	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	5	24	39	8	No	0%	.	.	.	N	.	A	.	.		.	.	.
745	E4/18	C	EH	18	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	2	18	19	3	Yes	1%-25%	Crush...	.	.	N	Feather	A	.	.		.	.	.
746	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
747	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	5	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
748	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
749	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
750	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	4	1	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
751	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
752	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
753	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
754	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
755	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
756	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	10	1	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
757	E4/18	C	EH	18	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
758	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	19	11	8	No	0%	.	.	.	N	.	A	.	.		.	.	.
759	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 7/4...	0	18	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
760	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
761	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	9	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
762	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
763	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
764	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
765	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	10	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
766	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
767	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
768	E4/17	C	EH	17	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
769	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	14	40	27	9	No	0%	.	.	.	N	.	A	.	.		.	.	.
770	E4/16	C	EH	16	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	6	41	28	6	No	0%	Flaked	4	12	N	Feather	A	.	.		.	.	.
771	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	32	10	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
772	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	38	10	5	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
773	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	20	12	4	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
774	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	25	18	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
775	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
776	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	21	6	5	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
777	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	11	2	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
778	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
779	E4/16	C	EH	16	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	13	7	3	No	0%	Natural	4	8	N	Feather	A	.	.		.	.	.
780	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
781	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
782	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
783	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
784	E4/16	C	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
785	E4/16	C	EH	16	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	0	8	18	1	No	0%	Natural	1	9	N	.	A	.	.		.	.	.
786	E3/16/1	M	EH	16	H'hoof core	Multid'l core	Chert	10YR 6/2...	22	37	22	22	No	0%	.	.	.	.	.	.	.	.		.	4	14
787	E3/16/2	M	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	28	13	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
788	E3/16/3	M	EH	16	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
789	E3/15/2	M	EH	15	Unr/t flake	Comp. flake,R/t	Chert	10YR 6/2...	2	33	14	5	No	0%	Flaked	4	8	N	Feather	A	.	.		.	.	.
790	E3/15/3	M	EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	7	47	22	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
791	E3/15/4	M	EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	5	46	17	8	No	0%	.	.	.	N	.	A	.	.		.	.	.
792	E3/15/5	M	EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	28	20	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
793	E3/15/6	M	EH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
794	E3/14/1	M	EH	14	Scraper flat-e	Comp. flake,R/t	Chert	10YR 6/2...	6	29	28	7	No	0%	Flaked	7	25	N	Feather	P	2	scalar	VRM & VLM	1%-25%	.	.
795	E3/14/...	M	EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	12	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
796	E3/14/...	M	EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
797	E3/14/...	M	EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	5	38	13	13	No	0%	.	.	.	N	.	A	.	.		.	.	.
798	E3/14/...	M	EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
799	E3/14/...	M	EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	20	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
800	E3/14/...	M	EH	14	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	2	19	16	6	No	0%	Natural	5	12	N	.	A	.	.		.	.	.
801	E3/14/...	M	EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	13	3	Yes	76%-99%	.	.	.	N	.	A	.	.		.	.	.
802	E3/14/...	M	EH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	16	9	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
803	E3/14/...	M	EH	14	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	3	22	29	6	No	0%	Natural	7	17	N	.	A	.	.		.	.	.
804	E3/13	M	EH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	8	3	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
805	E3/13/1	M	EH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	22	13	6	No	0%	.	.	.	N	.	A	.	.		.	.	.
806	E3/13/2	M	EH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	16	10	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
807	E3/13/3	M	EH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	20	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
808	E3/13/4	M	EH	13	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	1	12	17	4	No	0%	Natural	2	9	N	.	A	.	.		.	.	.
809	E3/13/5	M	EH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	15	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
810	E3/13/6	M	EH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	25	17	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
811	E3/13/7	M	EH	13	Flaked piece	Flaked p.	Chert	10YR 8/2...	1	24	13	5	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
812	E3/13/8	M	EH	13	Scraper flat-e	Prox. flake,R/t	Chert	10YR 6/2...	1	17	23	4	No	0%	Natural	1	5	N	.	P	1	serrated	DRP	.	.	.
813	E3/13/9	M	EH	13	Scraper flat-e	Comp. flake,R/t	Chert	10YR 6/2...	1	26	14	2	Yes	76%-99%	Flaked	1	5	N	Feather	P	2	scalar	DRP and DLP	1%-25%	.	.
814	E3/13/...	M	EH	13	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	2	30	16	3	No	0%	Natural	4	11	N	Feather	A	.	.		.	.	.
815	D3/9	C	Post EH-MH	9	Unr/t flake	Med. flake,no R/t	Chert	5Y 7/2 Y...	4	19	22	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
816	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	22	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
817	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
818	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	N7 Light ...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
819	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	18	10	3	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
820	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	0	12	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
821	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
822	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
823	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	5	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
824	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
825	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	4	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
826	D3/9	C	Post EH-MH	9	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	3	18	19	5	No	0%	Natural	3	7	N	.	A	.	.		.	.	.
827	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
828	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chert	10R 4/6 ...	0	8	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
829	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	4	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
830	D3/9	C	Post EH-MH	9	Unr/t flake	Comp. flake,no R/t	Chalc...	N4 Mediu...	0	10	14	4	No	0%	Natural	4	8	N	Feather	A	.	.		.	.	.
831	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	6	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
832	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	10YR 6/2...	0	8	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
833	D3/9	C	Post EH-MH	9	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	1	12	21	6	No	0%	Natural	4	15	N	.	A	.	.		.	.	.
834	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	3	21	19	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
835	D3/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	4	50	13	4	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
836	D3/9+8	C	Post EH-MH	9	Scraper round-e	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	0	18	14	4	No	0%	Natural	4	8	N	Feather	P	2	scalar	DLM	.	.	.
837	D3/9+8	C	Post EH-MH	9	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	17	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
838	D3/8	C	Post EH-MH	8	Multid'l core	Multid'l core	Chert	10YR 6/2...	33	63	40	12	Yes	1%-25%	.	.	.	.	.	.	.	.		.	3	7
839	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	5PB 7/2 ...	0	24	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
840	D3/8	C	Post EH-MH	8	Scraper round-e	Comp. flake,R/t	Chalc...	10YR 6/2...	9	39	44	4	No	0%	Natural	3	9	N	Step	P	2	scalar	DRP & DLP	1%-25%	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
841	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
842	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
843	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
844	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
845	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	3	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
846	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	6	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
847	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	1	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
848	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	7	6	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
849	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	4	3	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
850	D3/8	C	Post EH-MH	8	Unr/t flake	Comp. flake,no R/t	Chalc...	10YR 6/2...	0	19	17	2	No	0%	Natural	3	10	N	.	A	.	.		.	.	.
851	D3/8	C	Post EH-MH	8	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	17	14	4	Yes	26%-50%	Flaked	2	9	N	Feather	A	.	.		.	.	.
852	D3/8	C	Post EH-MH	8	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	2	25	17	3	Yes	1%-25%	Facett...	4	14	N	Feather	A	.	.		.	.	.
853	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	23	9	2	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
854	D3/8	C	Post EH-MH	8	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	19	10	3	Yes	26%-50%	Natural	3	11	N	Feather	A	.	.		.	.	.
855	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	N9 White	0	16	11	4	Yes	76%-99%	.	.	.	N	.	A	.	.		.	.	.
856	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	10	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
857	D3/8	C	Post EH-MH	8	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	14	9	2	No	0%	Natural	2	3	N	Feather	A	.	.		.	.	.
858	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	16	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
859	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	23	6	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
860	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
861	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
862	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	19	11	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
863	D3/8	C	Post EH-MH	8	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	10	8	2	No	0%	Natural	1	9	N	Feather	A	.	.		.	.	.
864	D3/8	C	Post EH-MH	8	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	12	8	2	No	0%	Natural	3	9	N	.	A	.	.		.	.	.
865	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
866	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	7	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
867	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
868	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
869	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
870	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
871	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
872	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
873	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
874	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
875	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	4	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
876	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	7	1	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
877	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	6	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
878	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
879	D3/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
880	D3/7	C	Post EH-MH	7	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	7	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
881	D3/7	C	Post EH-MH	7	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	6	1	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
882	D3/7	C	Post EH-MH	7	Unr/t flake	Prox. flake,no R/t	Chalc...	5Y 7/2 Y...	0	9	16	3	No	0%	Natural	2	7	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
883	D3/7	C	Post EH-MH	7	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	21	10	2	No	0%	Natural	2	2	N	Feather	A	.	.		.	.	.
884	D3/7	C	Post EH-MH	7	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	21	12	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
885	D3/7	C	Post EH-MH	7	Unid'l core	Unid'l core	Chert	10YR 6/2...	5	48	17	5	No	0%	.	.	.	.	.	.	.	.		.	4	4
886	D3/7	C	Post EH-MH	7	Unid'l core	Unid'l core	Chert	10YR 6/2...	9	34	21	14	No	0%	.	.	.	.	.	.	.	.		.	1	1
887	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	2	28	13	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
888	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	19	12	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
889	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	23	15	4	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
890	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	15	9	3	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
891	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chert	N3 Dark ...	0	21	13	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
892	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chert	5PB 7/2 ...	0	16	11	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
893	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	21	13	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
894	D3/6	C	Post EH-MH	6	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	13	12	4	Yes	1%-25%	Natural	3	9	N	Step	A	.	.		.	.	.
895	D3/6	C	Post EH-MH	6	Unr/t flake	Dist. flake,no R/t	Chalc...	5Y 7/2 Y...	0	16	11	4	No	0%	.	.	.	N	Feather	A	.	.		.	.	.
896	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	25	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
897	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	7	38	20	10	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
898	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	14	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
899	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
900	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	8	3	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
901	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	7	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
902	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
903	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
904	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
905	D3/6	C	Post EH-MH	6	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	10	8	3	No	0%	Natural	3	7	N	Feather	A	.	.		.	.	.
906	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
907	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	7	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
908	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	13	9	3	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
909	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
910	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	16	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
911	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	8	1	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
912	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	9	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
913	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	5	3	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
914	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	10	6	4	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
915	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	12	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
916	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5PB 7/2 ...	0	14	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
917	D3/6	C	Post EH-MH	6	Flaked piece	Flaked p.	Chalc...	5PB 7/2 ...	0	11	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
918	D3/6	C	Post EH-MH	6	Multid'l core	Multid'l core	Chert	10YR 6/2...	5	48	13	8	No	0%	.	.	.	.	.	.	.	.		.	3	3
919	D3/6	C	Post EH-MH	6	Multid'l core	Multid'l core	Chert	10YR 6/2...	3	18	15	8	No	0%	.	.	.	.	.	.	.	.		.	3	3
920	E3/12	M	Post EH-MH	12	Scraper round-e	Prox. flake,R/t	Chert	10YR 6/2...	0	13	11	2	No	0%	Natural	1	4	N	.	P	2	steep	DLP & DRP	1%-25%	.	.
921	E3/12/1	M	Post EH-MH	12	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	2	29	12	4	No	0%	Natural	2	4	N	Feather	A	.	.		.	.	.
922	E3/12/2	M	Post EH-MH	12	Scraper round-e	Comp. flake,R/t	Chert	10YR 6/2...	12	44	17	12	Yes	1%-25%	Crush...	.	.	N	Hinge	P	2	scalar	DRM & DLD	1%-25%	.	.
923	E3/12/3	M	Post EH-MH	12	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	5	35	21	6	Yes	1%-25%	Cortical	2	7	N	Feather	A	.	.		.	.	.
924	E3/12/4	M	Post EH-MH	12	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	1	14	37	2	No	0%	Natural	1	14	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
925	E3/12/5	M	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	35	12	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
926	E3/12/6	M	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	21	12	4	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
927	E3/12/7	M	Post EH-MH	12	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	2	14	9	10	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
928	E3/12/8	M	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	1	17	12	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
929	E3/12/9	M	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	9	3	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
930	E3/12/...	M	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
931	E3/12/...	M	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	9	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
932	E3/12/...	M	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
933	E3/12/...	M	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
934	E3/11	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	25	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
935	E3/11/1	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
936	E3/11/2	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
937	E3/11/3	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	3	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
938	E3/11/4	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	7	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
939	E3/11/5	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
940	E3/11/6	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
941	E3/11/7	M	Post EH-MH	11	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	10	9	3	No	0%	Natural	3	7	N	Feather	A	.	.		.	.	.
942	E3/11/8	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	8	1	Yes	76%-99%	.	.	.	N	.	A	.	.		.	.	.
943	E3/11/9	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
944	E3/11/...	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	11	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
945	E3/11/...	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
946	E3/11/...	M	Post EH-MH	11	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	17	11	2	No	0%	Flaked	1	6	N	Feather	A	.	.		.	.	.
947	E3/11/...	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	21	9	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
948	E3/11/...	M	Post EH-MH	11	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	19	12	4	No	0%	Natural	1	5	N	Feather	A	.	.		.	.	.
949	E3/11/...	M	Post EH-MH	11	Scraper round-e	Comp. flake,R/t	Chert	5 YR 7/2 ...	0	15	13	2	No	0%	Natural	2	8	N	.	P	3	serrated	VLM,VRM,VPM	1%-25%	.	.
950	E3/11/...	M	Post EH-MH	11	Scraper flat-e	Comp. flake,R/t	Chert	10YR 6/2...	0	19	11	4	Yes	26%-50%	Facett...	4	13	N	Step	P	1	scalar	DLM	1%-25%	.	.
951	E3/11/...	M	Post EH-MH	11	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	27	16	5	Yes	1%-25%	Cortical	5	15	N	Feather	A	.	.		.	.	.
952	E3/11/...	M	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	25	4	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
953	E3/11/...	M	Post EH-MH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	29	12	5	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
954	E3/11/...	M	Post EH-MH	11	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	3	36	16	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
955	E3/10	M	Post EH-MH	10	Scraper flat-e	Comp. flake,R/t	Chert	10YR 6/2...	0	12	15	3	Yes	1%-25%	Natural	2	8	N	Feather	P	1	serrated	DLM	1%-25%	.	.
956	E3/10/1	M	Post EH-MH	10	Scraper flat-e	Comp. flake,R/t	Chert	10YR 6/2...	8	27	33	8	Yes	1%-25%	Natural	10	13	N	Feather	P	1	scalar	VPM	1%-25%	.	.
957	E3/10/3	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
958	E3/10/4	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
959	E3/10/5	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
960	E3/10/6	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
961	E3/10/7	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
962	E3/10/8	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	5 Y 7/2 Y...	0	9	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
963	E3/10/9	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
964	E3/10/...	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	9	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
965	E3/10/...	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
966	E3/10/...	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	9	1	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
967	E3/10/...	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
968	E3/10/...	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
969	E3/10/...	M	Post EH-MH	10	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	11	13	3	No	0%	Natural	2	7	N	Hinge	A	.	.		.	.	.
970	E3/10/...	M	Post EH-MH	10	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	13	9	2	No	0%	Natural	1	5	N	Feather	A	.	.		.	.	.
971	E3/10/...	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	21	10	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
972	E3/10/...	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
973	E3/10/...	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	26	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
974	E3/10/...	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
975	E3/10/...	M	Post EH-MH	10	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	16	12	3	No	0%	Natural	1	8	N	Feather	A	.	.		.	.	.
976	E3/10/...	M	Post EH-MH	10	Flaked piece	Flaked p.	Chert	5Y 7/2 Y...	0	16	10	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
977	E3/10/...	M	Post EH-MH	10	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	0	30	9	2	No	0%	Natural	2	6	N	Feather	A	.	.		.	.	.
978	E3/10/...	M	Post EH-MH	10	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	3	20	23	8	Yes	26%-50%	Natural	6	16	N	Step	A	.	.		.	.	.
979	E3/10/...	M	Post EH-MH	10	Unid'l core	Unid'l core	Chert	10YR 6/2...	6	40	21	8	Yes	1%-25%	.	.	.	.	.	.	.	.		.	1	2
980	D2/10	C	Post EH-MH	10	Flaked piece	Flaked p.	Chalc...	10YR 7/4...	0	12	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
981	D2/9	C	Post EH-MH	9	Unr/t flake	Comp. flake,no R/t	Chalc...	5Y 7/2 Y...	0	16	10	2	Yes	1%-25%	Natural	1	3	N	Plunge	A	.	.		.	.	.
982	D2/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chert	N8 Very l...	0	11	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
983	D2/9	C	Post EH-MH	9	Flaked piece	Flaked p.	Chert	N8 Very l...	0	10	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
984	D2/9	C	Post EH-MH	9	Scraper round-e	Comp. flake,R/t	Chalc...	5Y 7/2 Y...	0	17	16	2	Yes	1%-25%	Natural	2	5	N	Feather	P	2	scalar	DRP & DLM	1%-25%	.	.
985	D2/8	C	Post EH-MH	8	Unid'l core	Unid'l core	Chert	N5 Mediu...	14	42	34	13	Yes	1%-25%	.	.	.	.	.	.	.	.		.	2	2
986	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 2/2...	0	7	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
987	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 2/2...	0	11	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
988	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
989	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
990	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
991	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	5	3	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
992	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	11	3	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
993	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	5Y 7/2 Y...	0	8	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
994	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	6	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
995	D2/8	C	Post EH-MH	8	R/t flake	Comp. flake,R/t	Chert	10YR 6/2...	0	14	5	1	Yes	26%-50%	Natural	1	3	N	Feather	P	1	scalar	DRM	1%-25%	.	.
996	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	4	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
997	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	3	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
998	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
999	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	5	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1000	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	5	2	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
1001	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chalc...	10YR 8/2...	0	11	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1002	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	N5 Mediu...	0	15	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1003	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	7	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1004	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 2/2...	0	19	15	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1005	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	9	2	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
1006	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	20	12	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1007	D2/8	C	Post EH-MH	8	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	12	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
1008	D2/8	C	Post EH-MH	8	Scraper round-e	Comp. flake,R/t	Chert	5Y 7/2 Y...	0	20	13	2	Yes	26%-50%	Natural	1	2	N	Feather	P	2	scalar	DRM & DDM	1%-25%	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
1009	E4/15	C	Post EH-MH	15	Unid'l core	Unid'l core	Chert	10YR 6/2...	0	17	18	1	No	0%	.	.	.	.	.	.	.	.		.	1	1
1010	E4/15	C	Post EH-MH	15	Unr/t flake	Comp. flake,no R/t	Chert	10YR 6/2...	5	36	16	6	Yes	1%-25%	Cortical	11	20	N	Feather	A	1	.		.	.	.
1011	E4/15	C	Post EH-MH	15	Scraper round-e	Comp. flake,R/t	Chert	10YR 6/2...	0	21	16	4	No	0%	Flaked	7	19	N	Feather	P	1	serrated	VRP	1%-25%	.	.
1012	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	11	3	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1013	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	8	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
1014	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1015	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1016	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1017	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1018	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	6	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1019	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1020	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1021	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	8	3	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
1022	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1023	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	11	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1024	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1025	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	5	1	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
1026	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1027	E4/15	C	Post EH-MH	15	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	21	9	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1028	E4/14	C	Post EH-MH	14	Scraper round-e	Prox. flake,R/t	Chert	10YR 6/2...	0	13	26	6	Yes	26%-50%	Natural	5	15	N	.	P	2	steep	VRM & VRP	1%-25%	.	.
1029	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	22	15	4	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t_Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
1030	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1031	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1032	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	11	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1033	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1034	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1035	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1036	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1037	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	6	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
1038	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1039	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1040	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	23	5	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1041	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1042	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1043	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1044	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	17	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1045	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	15	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1046	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	10	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1047	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	13	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1048	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	7	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1049	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	8	1	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1050	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	12	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
1051	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	12	5	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1052	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	13	6	1	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1053	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1054	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	8	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1055	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	8	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1056	E4/14	C	Post EH-MH	14	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	7	5	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1057	E4/13	C	Post EH-MH	13	Scraper round-e	Comp. flake,R/t	Chert	5YR 3/2 ...	7	33	25	7	Yes	26%-50%	Flaked	7	15	N	Feather	P	3	scalar	VLM,VRP,DM	1%-25%	.	.
1058	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	3	27	19	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
1059	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	22	14	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
1060	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	32	8	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
1061	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	21	12	4	No	0%	.	.	.	N	.	A	.	.		.	.	.
1062	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1063	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	5PB 7/2 ...	0	21	15	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1064	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	5PB 7/2 ...	0	18	15	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1065	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	4	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1066	E4/12	C	Post EH-MH	12	Scraper round-e	Comp. flake,R/t	Chert	10YR 6/2...	21	43	45	9	Yes	1%-25%	Natural	11	18	N	.	P	3	scalar	DLM,DRM,VPM	1%-25%	.	.
1067	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	29	16	4	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
1068	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	11	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1069	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	19	18	4	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1070	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	12	4	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
1071	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	12	5	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
1072	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	17	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1073	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	14	2	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
1074	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1075	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1076	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1077	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1078	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1079	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1080	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1081	E4/11	C	Post EH-MH	11	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	2	17	22	4	No	0%	Natural	5	11	N	.	A	.	.		.	.	.
1082	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	23	11	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
1083	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	21	12	7	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1084	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	8	2	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
1085	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	8	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1086	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1087	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	5PB 7/2 ...	0	21	15	3	No	0%	.	.	.	N	.	A	.	.		.	.	.
1088	E4/13	C	Post EH-MH	13	Flaked piece	Flaked p.	Chert	5PB 7/2 ...	0	18	15	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1089	E4/13.2	C	Post EH-MH	13	Multid'l core	Multid'l core	Chert	10YR 6/2...	16	49	21	2	Yes	1%-25%	.	.	.	.	.	.	.	.		.	2	5
1090	E4/12	C	Post EH-MH	12	Scraper round-e	Comp. flake,R/t	Chert	10YR 6/2...	21	43	45	9	Yes	1%-25%	Natural	11	18	N	Feather	P	3	scalar	DLM, DRM, D...	1%-25%	.	.
1091	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	29	16	4	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
1092	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	11	2	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
1093	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	19	18	4	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1094	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	16	12	4	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
1095	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	18	12	5	No	0%	.	.	.	N	.	A	.	.		.	.	.
1096	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	17	8	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1097	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	14	2	Yes	26%-50%	.	.	.	N	.	A	.	.		.	.	.
1098	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	12	9	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1099	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1100	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	7	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1101	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1102	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1103	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1104	E4/12	C	Post EH-MH	12	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	6	4	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
1105	E4/11	C	Post EH-MH	11	Unr/t flake	Prox. flake,no R/t	Chert	10YR 6/2...	2	17	22	4	No	0%	Natural	5	11	N	.	A	.	.		.	.	.
1106	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	23	11	7	No	0%	.	.	.	N	.	A	.	.		.	.	.
1107	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	2	21	12	7	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1108	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	8	2	Yes	51%-75%	.	.	.	N	.	A	.	.		.	.	.
1109	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	8	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1110	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	5	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1111	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	8	6	2	Yes	1%-25%	.	.	.	N	.	A	.	.		.	.	.
1112	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	9	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1113	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	11	9	1	No	0%	.	.	.	N	.	A	.	.		.	.	.

	Art_No	M.C	Time_Period	Spit	Typology	Technol_Status	Raw_M	Colour	Weight	Length	Width	Thick	Cortex	Cortext_Ext	P.Type	P.Thick	P.Width	O_h.Rem	Term_Type	Retouch	R_t.Margins	R_t_T...	R_t_Locn	R_t_Inv	Core_No_of_Pl...	Core_No_Neg_FS
1114	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1115	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	10	6	2	No	0%	.	.	.	N	.	A	.	.		.	.	.
1116	E4/11	C	Post EH-MH	11	Flaked piece	Flaked p.	Chert	10YR 6/2...	0	14	6	1	No	0%	.	.	.	N	.	A	.	.		.	.	.
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