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Front cover:
Dead standing black box Culturally Modified Tree along Kromelak *(Outlet Creek) (Photo: Darren Griffin)*

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Editorial note

The papers included in this ninth issue of *Excavations, Surveys and Heritage Management in Victoria* were presented at the annual Victorian Archaeology Colloquium held at La Trobe University on 1 February 2020. Once again we had over 150 participants whose attendance testifies to the importance of this fixture within the local archaeological calendar. It continues to be an important opportunity for consultants, academics, managers and Aboriginal community groups to share their common interests in the archaeology and heritage of the State of Victoria.

The papers published here deal with a variety of topics that span Victoria's Aboriginal and European past. While some papers report on the results of specific research projects others focus on aspects of method, approach, education and the social context of our work. and approach.

In addition to the more developed papers, we have continued our practice of publishing the abstracts of other papers given at the Colloquium, illustrated by a selection of the slides taken from the PowerPoint presentations prepared by participants. These demonstrate the range of work being carried out in Victoria, and we hope that many of these will also form the basis of more complete studies in the future. All papers were refereed by the editorial team. This year Elizabeth Foley managed this process and the sub-editing of this volume under the guidance of Caroline Spry. Layout was again undertaken by David Frankel.

Previous volumes of *Excavations, Surveys and Heritage Management in Victoria* are freely available through La Trobe University's institutional repository, Research Online < www.arrow.latrobe.edu.au:8080/vital/access/manager/Repository/latrobe:41999 >. We hope that this will encourage the dissemination of ideas and information in the broader community, both in Australia and internationally.

We grateful to the Colloquium's major sponsors ACHM, Ochre Imprints, Ecology and Heritage Partners and Heritage Insight; sponsors Biosis, ArchLink, Christine Williamson Heritage Consultants and Extent; and to la Trobe University for continuing support. We would like to thank them, and all others involved for their generous contributions towards hosting both the event and this publication. Yafit Dahary of 12 Ovens was, as always, responsible for the catering.

Preparation of this volume was, like so much else in 2020, undertaken during the severe restrictions imposed because of the COVID-19 pandemic. We hope that 2021 will be a better year for all and that even if we are unable to hold our Colloquium at the usual time we will be able to do so later in the year.

The editors and authors acknowledge the Traditional Owners of the lands and heritage discussed at the Colloquium and in this volume, and pay their respects to their Elders, past and present.

Murrup Tamboore: community-led archaeological investigations at the former Keilor Archaeological Area

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Abstract

In 2018, Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation engaged La Trobe University to assist with archaeological investigations at the Keilor Archaeological Area (now known as Murrup Tamboore, or 'Spirit Waterhole'). Erosion control works were required at the site, providing an opportunity to investigate the stratigraphy close to the location where Ancestral Remains were uncovered in 1940. A narrow vertical section of the creek bank was exposed and sediment deposition was dated using OSL, with stone artefact-bearing layers dated to approximately 6.5 ka and 30 ka. Loose sediment and intact sediment block samples were collected for studying past environmental conditions and charcoal samples were subject to anthracological analysis. An archaeological survey was completed for the entire property, resulting in the identification of almost 300 stone artefacts. This paper reports on the results of the project to date.

Introduction

The Murrup Tamboore Archaeology Project is a collaborative project led by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation (WWCHAC) with assistance from La Trobe University (LTU) and the University of Wollongong. Murrup Tamboore (formerly known as the Keilor Archaeological Area) is situated approximately 16.5 km northwest of the Melbourne CBD, at the confluence of Arundel Creek (formerly Dry Creek) and the Maribyrnong River (**Figure 1**). This Aboriginal place became known to the international scientific and broader community following the identification of Ancestral Remains in 1940 (Mahoney 1943a:31). The name *Murrup Tamboore* means 'Spirit Waterhole' in the Woi-wurrung language.

In recent years, water level fluctuations in Arundel Creek have eroded the creek bank. This erosion was recognised as having potential to impact on cultural heritage at Murrup Tamboore, prompting WWCHAC to arrange for erosion-control works. A number of options for erosion control were explored and it was decided that a custom rock wall design would result in the least additional short-term impact to the creek bank. WWCHAC decided that it would be necessary to understand how the construction of the rock wall would impact on any cultural material and decided that a small-scale archaeological investigation would be the best way to obtain the required information. WWCHAC were particularly interested in dating and characterising the creek bank stratigraphy and in understanding the possibility of Ancestral Remains being present in the proposed construction area. WWCHAC also decided that this project would provide a suitable opportunity to update the site records on the Victorian Aboriginal Heritage Register (VAHR) by conducting a survey of the property north of the confluence to identify cultural heritage present on the ground surface. LTU was engaged to assist with the investigation and a partnership with the University of Wollongong was also established.

Previous research at Murrup Tamboore

In 1940, Ancestral Remains were identified during commercial quarrying activities at the locality now known as Murrup Tamboore. The cranium was identified adjacent to Dry Creek (now Arundel Creek) and acquired by the National Museum in Melbourne (now Museum Victoria). Due to the nature of their recovery, the exact find location for the Ancestral Remains was unclear to the researchers who were trying to investigate their stratigraphic origin. Bosler (1975) noted that Daniel James Mahony, who worked at the Museum, described the find location in different ways: 'at a depth of 19ft' (Mahony 1943a:30), 'about 15ft below the surface of the ground and 18ft above the floor of the pit' (Mahony 1943a:31), and 'the skull was unearthed beneath undisturbed strata at 18ft below the surface of the terrace' in his second contribution to the same volume (Mahony 1943b:79). In the 1940s, there were no techniques available that could provide absolute age estimates for the Ancestral Remains, so their likely age was initially interpreted by drawing comparisons between terrace sequences in Europe and the Maribyrnong River terraces, which were (incorrectly) assumed to be associated with sea level change (Keble and Macpherson 1946).

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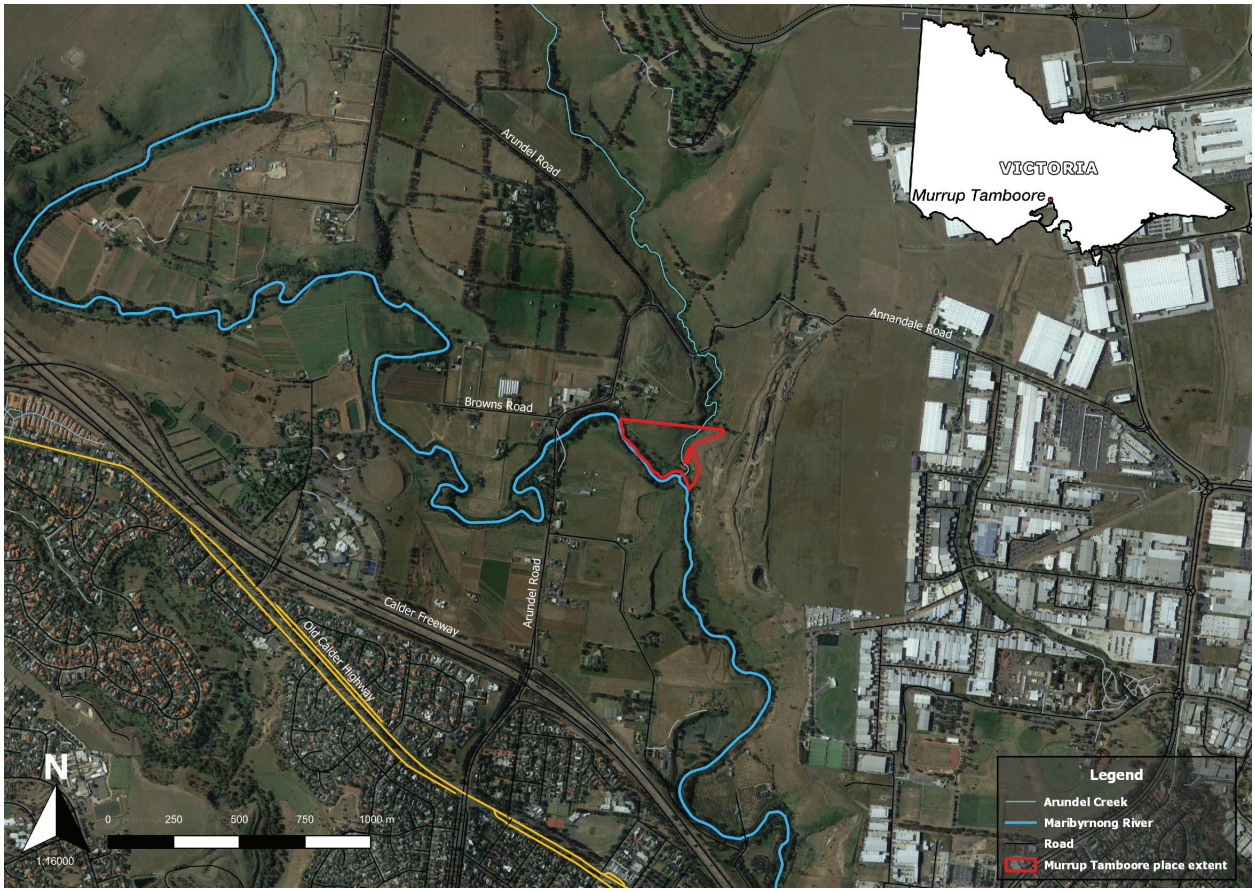

Figure 1. Map showing the location of Murrup Tamboore at the confluence of Arundel Creek and the Maribyrnong River

Subsequent reassessment of the geomorphological setting of the site by Edmund Gill, confirmed the presence of three distinct terraces (Gill 1966):

1. The Arundel Terrace—the highest and oldest terrace, comprised of 'Arundel Formation' sediments;
2. The Keilor Terrace—comprised of 'Doutta Galla Silts'; and
3. The Maribyrnong Terrace—the lowest and youngest terrace, comprised of 'Maribyrnong Alluvium'

The Braybrook Terrace, previously reported by Keble and Macpherson (1946), was reinterpreted as an eroded remnant of the Keilor terrace (Gill 1953:230).

Re-examining the Ancestral Remains, Gill noted sediments adhering to some surfaces (a yellow loess-like silt), which allowed a correlation to the exact layer from which they had originated (the upper part of the Doutta Galla Silt), ending the uncertainty of their provenance (Bosler 1975). The advent of the radiocarbon dating method provided an opportunity to radiometrically date the site; Murrup Tamboore was the second Australian site to be radiocarbon dated, providing an age of 8,500±250 BP (9,590±620 cal BP) (Bosler 1975:25). This was derived from charcoal from a hearth, located at least 'four feet' above the layer with the Ancestral Remains; this gave the first minimum age for the site (Rubin and Suess 1955:489). Gill (1971:75) went on to obtain a date of 7,360±105 BP (uncalibrated) derived from calcium carbonate precipitate adhering to the Ancestral Remains cranium (this provided further evidence for a minimum age.

When the Dry Creek channel was straightened, Gill returned to the site, documenting a further series of hearths through the terraces, and an additional date of 15,000±1,500 BP (uncalibrated) from a hearth at 'about the level' from which the Ancestral Remains originated (Gill 1966:584). Further research and analysis supported this, with a date of 18,000±500 BP (uncalibrated) coming from a hearth '5ft. 9in.' below the layer of the Ancestral Remains (Ferguson and Rafter 1959:232–233). At the time this was the earliest direct evidence for Aboriginal populations in Australia, and much earlier than other radiometrically dated sites in Australia.

Between 1966 and 1974 Gallus and the Archaeological Society of Victoria commenced large-scale excavations at Murrup Tamboore, with Gallus developing a number of contentious hypotheses (e.g. Gallus 1971:9), some of which have subsequently been disproven (e.g. Munro 1998). A series of radiocarbon dates were produced by the project, some of which were inverted, and thus likely either contaminated or impacted upon by intrusions (Duncan 2001). Faunal analyses were undertaken by Marshall (1974), which suggested the presence of megafauna at the site prior to ~20,000 years ago. In 1976, Joyce and Anderson published a summary of all available

dates on the deposits: thirty-two dates in total, 24 from the Keilor Terrace and 8 from the Arundel Terrace.

On the 27th of September 1976, the Victoria Archaeological Survey (now Aboriginal Victoria) purchased the property adjoining the quarry on which the Ancestral Remains were identified. A team directed by Paul Ossa (LTU) and the Victoria Archaeological Survey (VAS) undertook excavations at Murrup Tamboore (at the property adjacent to the Ancestral Remains find location) between 1977 and 1982. These comprised three 3 x 3 m squares, with only one excavated to sterile sediments at a depth of 7.2 m (Duncan 2001). Only one date was processed from these excavations: 13,300±1,100 BP (uncalibrated) from the Keilor Terrace. The LTU/VAS excavations recovered a number of hearths, stone artefacts and faunal remains.

Duncan (2001) conducted an analysis of the faunal material found during the LTU/VAS excavations, identifying the presence of species from a number of categories: large marsupial, medium marsupial, small mammal, large macropod, medium macropod, small macropod, megafaunal macropod and megafauna (unidentified). Most of the specimens examined by Duncan (2001) were water rolled and therefore interpreted as having been transported to Murrup Tamboore by fluvial processes. However, a small number of specimens appeared to have been identified in situ in sediments dating to ~20,000 BP.

Investigations at Murrup Tamboore, over the course of the last eighty years, have established this place as a significant site in the story of Australia. It was the one of the first sites in Australia to be radiometrically dated, demonstrating the long history of Aboriginal presence in Australia. Unfortunately, none of the earlier phases of research incorporated consultation with the Traditional Owner community. The most recent research, which is the subject of this paper, has been led by WWCHAC.

Fieldwork activities in 2018

There were two fieldwork components to the project: pedestrian survey and excavation.

Survey

To improve ground-surface visibility for the survey, a controlled burn was undertaken on the property by the Narrap Team (part of the WWCHAC, who undertake environmental land management activities on Wurundjeri lands) and Habitat Land Management (HLM). The presence of moisture from recent rainfall inhibited the burn but some improvement to ground-surface visibility was achieved, particularly due to the reduction of dead grass buildup between extant clumps.

The pedestrian survey was undertaken on 18 and 19 June 2018, with detailed artefact recording continuing on 20 and 21 June. During the survey, participants were spaced approximately 2.5 m apart. Ground-surface visibility varied across the property, with particularly poor visibility (generally 0%) encountered close to the confluence of Arundel Creek and the Maribyrnong River and close to Arundel Creek further upstream. The highest artefact densities were identified in areas with better visibility, for example, at the most elevated part of the survey area near the northern boundary fence (visibility ~50%), and where part of the upper landform is eroding (visibility ~75%).

All of the 296 cultural material items identified during the survey are stone artefacts. The raw materials include silcrete, quartzite, quartz and basalt. Interpretation of the detailed information that was recorded about these artefacts is presented below.

Stone-working activities at Murrup Tamboore

At Murrup Tamboore, there is evidence for the use of a variety of mostly high-quality raw materials that were probably available in the region, including silcrete, quartzite, quartz and basalt. Basalt was used as a hammerstone on at least one occasion, probably to work large pieces of silcrete identified at the most elevated part of Murrup Tamboore until it broke and was discarded. Quartz and quartzite appear to have been obtained as pebbles and cobbles from streambed sources. The basalt hammerstone was probably also obtained from a streambed somewhere in the broader region. Research into stone sources on Wurundjeri Country is currently underway and it is therefore likely that further relevant information will be generated in coming years. At present, silcrete is known to outcrop at a number of locations along the Maribyrnong River Valley, including at Brimbank Park approximately 2.5 km to the south of Murrup Tamboore.

The range of knapping debris present suggests that all stages of reduction are represented at Murrup Tamboore, although there is more evidence for early and mid-stages of reduction (e.g. raw material testing and flake production) than later stages (e.g. tool use and maintenance). In general, cores were worked informally, with cores rotated to allow any suitable platform to be utilised. Suitable platforms were often worked bifacially. The bipolar technique was employed at least some of the time to work both quartz and silcrete. Evidence for systematic blade production is not common and there are few signs of a need to conserve raw material at Murrup Tamboore. On average, better quality raw material tended to be worked more intensively than poorer quality raw material but many cores were not worked to exhaustion. A small proportion of artefacts identified at Murrup Tambore during 2018 exhibit retouch or macroscopic signs of use.

Excavation

The excavation, located at the site of the proposed erosion-control works, exposed the full ~4.5 m stratigraphic profile of the Arundel Creek bank allowing the stratigraphy to be described and dated. The excavation trench varied from 0.5 to 1 m in width, allowing for sedimentological characterisation of the profile, while minimising impact on any cultural materials. This approach was in line with Wurundjeri's plan to learn more about the nature of the embankment location without causing unnecessary impacts to the site. It also reflected the engineering design for the

rock embankment, which was to include no excavation into the creek bank, but had the potential to result in slumping of the face of the embankment.

Stratigraphy and dating

Six stratigraphic units have been defined for this profile (**Figure 2; Table 1**), with Unit 2 further divided into subunits 2a and 2b to reflect subtle differences in the lower and upper portions of the 'buff silts' unit. Nathan Jankowski collected samples for OSL analysis from all units except Unit 5, with two samples taken from Unit 2a, and one sample taken from several metres upstream of the excavation trench, where a suitable exposure of Unit 4 was identified (seven samples in total). These samples were processed at the University of Wollongong by Nathan Jankowski and Zenobia Jacobs. Age estimates for the uppermost 5 samples from Units 1 to 3 (MTAP18-01 to -05), range from ~6.5 to ~34 ka, with the lowest 2 samples (MTAP18-07 and -06) having minimum age estimates only (of >126 ka and >91 ka).

Unit 6 likely represents an overbank/floodplain swamp environment, with high clay content and abundant organic matter (charcoal). Significant redoximorphic gleying (red/grey mottling) and carbonate-nodule formation within this unit point to its significant antiquity. Unit 6 is eroded into by Unit 5 (lower grey sand) and Unit 4 (gravel); gravel clasts in these units indicate a shift in the depositional environment to river channel deposit. There is no significant difference in age between MTAP18-07 (>126 ka) and MTAP18-06, and it is likely that Units 4, 5 and 6 all date prior to ~126 ka, presumably during the penultimate glacial maximum.

The coarse gravel located in the base of Unit 3 (upper grey sand) suggests an erosive event prior to deposition, with the fining upwards sequence suggesting a point bar or other in-channel feature. The overlying Units 2a and 2b (upper and lower buffs silts, respectively) were deposited rapidly and are unable to be separated in time from each other (34±2–29±1 ka; n=3) or the underlying Unit 3 (29±1 ka). The silt-dominated sediments that comprise these units are likely to represent an overbank sequence deposited relatively close to the channel.

There is a significant time difference in the age estimates for Units 2a/b and Unit 1. There is no clear evidence in the investigated stratigraphic profile beyond the sharp erosive upper contact to explain this. The most likely cause for this truncation is thought to be associated with the lateral movement of Maribyrnong River after the deposition of Unit 2a (Bowler 1970). The sediment mixing associated with the Unit 1 OSL sample is most likely a result of the intense rootlet activity observed within the sediments here, but other biological activity, such as livestock trampling, is also possible.

Two stone artefacts (one quartz split flake and one silcrete core) were identified on the ground surface near the excavation location and 11 stone artefacts were identified during the excavation (three were identified in situ and eight in the sieve). Of the three in situ artefacts, two (one silcrete whole flake and one silcrete angular fragment) were found at the same depth as OSL sample MTAP18-01 and were therefore likely to

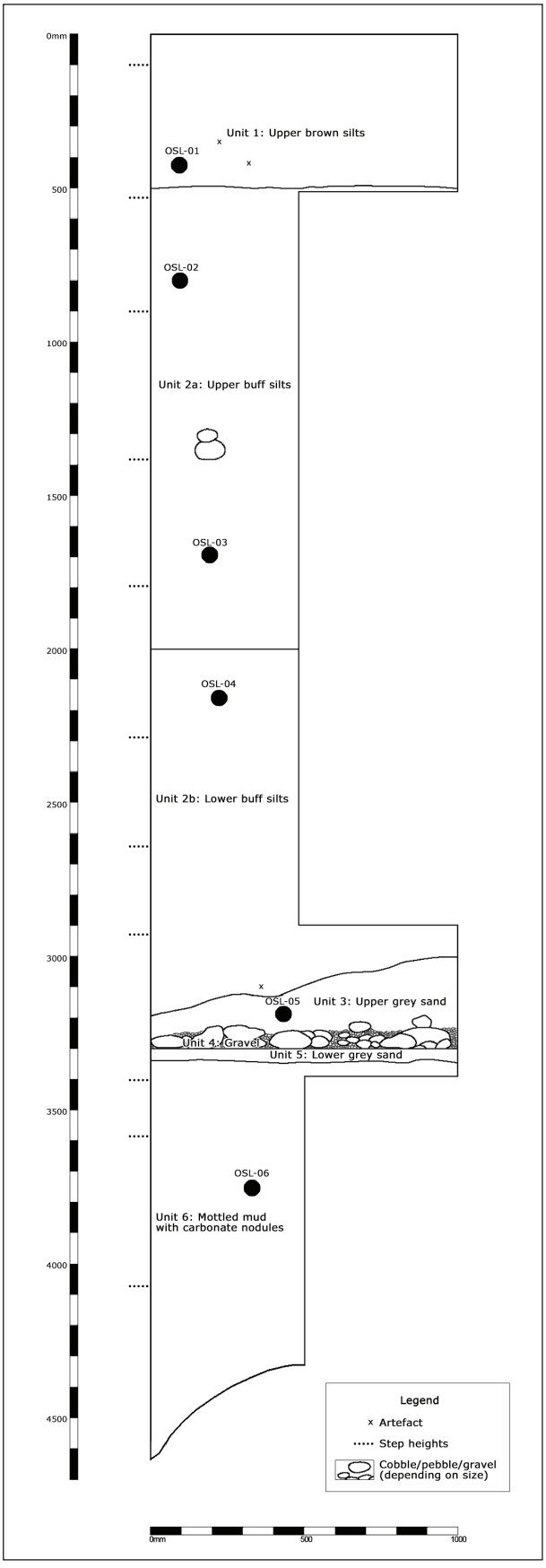

Figure 2. Section drawing for the excavation trench

Unit Number	Unit sedimentological description	Depth of lower boundary (cm)	Thickness of unit (cm)	Associated OSL samples (*Age estimates*)*
1	***Upper brown silts:*** mid-brown silts with minor very fine to fine sand. Sharp lower contact. Contains laterally continuous, buff-coloured, thin layers of fine silt. Rip-up clasts of underlying unit up to 1 cm in size present in base of unit. Slightly prismatic ped formation indicating shrink-swell clay within the sediment. Abundant rootlets throughout the back wall of the section.	50	50	MTAP18-01 (*6.5±0.8 ka*)
2a	***Upper buff silt:*** buff, homogeneous, moderately-sorted silts and fine sand. Fine laminations of sediment throughout. Upper surface contains abundant organic stained rootlet channels. Development of redoximorphic features at ~20 cm depth from upper surface in the form of red/orange iron-oxide staining along rootlet channels which persist throughout. Very rare clusters of pebbles and cobbles found mainly as sets of 2–4 clasts.	200	150	MTAP18-02 (*30±1 ka*) MTAP18-03 (*29±1 ka*)
2b	***Lower buff silts:*** similar in colour and composition as Upper buff silts but fining upwards, moving from coarser at the base to fine at the top of the unit. Upper most 25 cm is slightly darker in colour and has a slightly elevated clay and organic carbon content. Redoximorphic stained rootlet channels persist throughout. Small lenses of fine to medium sand found occasionally throughout the lowermost 10 cm of the unit and associated with moderately developed primary bedding planes.	305	105	MTAP18-04 (*34±2 ka*)
3	***Upper grey sand:*** light-grey fine to medium sand with minor silts. Scour surface lower boundary contact with infilling granules and fine pebbles.	320	15	MTAP18-05 (*29±1 ka*)
4	***Gravel***: clast-supported, poorly-sorted, pebble and cobble layer with interstitial sand and silt matrix. Strongly indurated with red-brown oxide staining. Lower surface scours into underlying unit. Sample collected from same unit several metres upstream of excavation trench	330	10	MTAP18-07 (*>126 ka*, -17/+∞)
5	***Lower grey sand:*** similar in composition as Upper grey sand. Coarsening upwards. Scour base.	335	5	-
6	***Mottled mud:*** red/brown, dense, heavy clay with minor very fine to fine sand. Strongly developed prismatic peds. Abundant carbonate nodules and mottled. Occasional charcoal fragments of up to 1 cm in size. Redoximorphic staining throughout.	400	75	MTAP18-06 (*>91 ka*, -10/+∞)

Table 1. Stratigraphic unit descriptions and OSL age estimates

have been incorporated into the creek bank sediments approximately 6,500 years ago. The other in situ artefact (a silcrete angular fragment) was found in Unit 2b and was therefore likely to have been buried by creek bank sediments approximately 30,000 years ago. These artefacts may have been incorporated into the creek bank sediments at approximately these times, or they may have worked their way down into these stratigraphic layers over time via cracks opening up during the wetting and drying of sediments with clay content. In the case of the artefact associated with the age estimate of 30,000 years, its vertical movement would have approximated 2.5 m for this artefact to descend to the level it was found, if it originated from the younger layers above. This is considered improbable.

Interpreting the sediments and age estimates with respect to the results of previous studies, including geomorphological studies of the broader Maribyrnong River valley terrace system, is a challenge that is currently being addressed in the next phase of the project. The sediments described for the 2018 excavation bear a resemblance to those described in previous research—in particular Units 2a and 2b most closely resemble the Keilor Terrace (Doutta Galla Silts), with Units 4, 5 and 6 appearing to correlate to the Arundel Terrace (Mottled Clays/gravels complex). However, the dates obtained from the 2018 excavation are older than what would be expected for the Keilor Terrace, and this requires explanation.

Anthracology (charcoal analysis)

Charcoal and possible charcoal samples obtained during the excavation were examined as part of a student project. Molly Thomas, who is an undergraduate student at LTU, has been learning how to identify plant taxa from the wood anatomy of charcoal remains under

the guidance of Fleur King, a PhD student at LTU. This work has involved preparing a reference collection of some of the plant species that are likely to be represented in the charcoal from Murrup Tamboore.

To identify suitable species for the reference collection, King and Thomas consulted the pre-1750s Ecological Vegetation Classes model for the area around Murrup Tamboore and compiled a list of plant species thought to have been growing in the area in the recent past. To collect specimens for the reference collection, Thomas, King and Kurpiel collected branch wood from a number of different trees and shrubs from the LTU Wildlife Sanctuary with the assistance of Scott Tunbridge, who works there. The wood samples were then turned into charcoal using a muffle furnace. The samples were charred for 40 minutes at 400°C, which proved effective for the majority of the samples.

Thomas has completed the analysis of the 16 samples recovered from the site, five of which preserved adequate anatomical features to allow identification to various taxonomic levels: two samples were identified as *Eucalyptus camaldulensis* (river red gum) (**Figure 3**), one as *Eucalyptus* sp. (indeterminate Eucalyptus species), and two as belonging to the family *Myrtaceae*. The remaining samples were unable to be identified as they were either too vitrified or composed mostly of soil and rock. The next phase of the project will involve further analysis of the palaeoecology of the site.

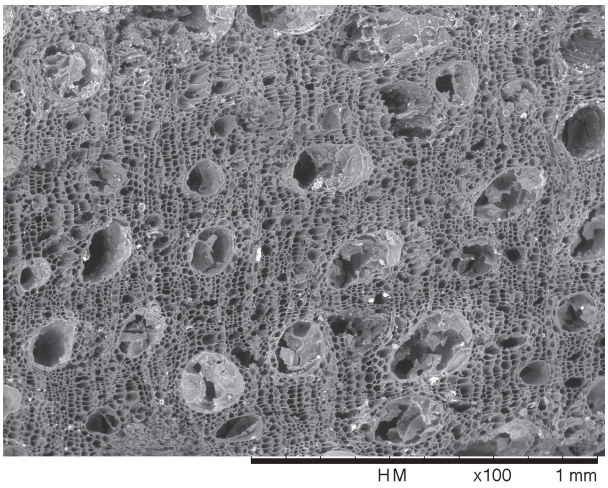

Figure 3. Scanning Electron Microscopy (SEM) image of charcoal identified as Eucalyptus camaldulensis *viewed at 100x magnification showing large solitary vessels and smaller wood fibre cells*

Site registration

The activities undertaken at Murrup Tamboore in 2018 resulted in the amalgamation of previous site registrations, and the extension of site boundaries to reflect the property parcel in its entirety, as well as the location where the Ancestral Remains were identified on the adjacent property. In addition, the project spurred the undertaking of a cultural values recording, which provided Elders with the opportunity to visit Country, and record knowledge and connections to both the Murrup Tamboore site, and the wider landscape of the Maribyrnong River valley. This approach recognised the importance of intangible values associated with archaeological sites, which are often overlooked within Victorian methods of undertaking site registrations.

Conclusion

The approach undertaken with this research, driven by the desire of the Traditional Owners to learn more about their cultural sites, and where impacts are minimised to those required, ensures that research is undertaken in a way that is sympathetic to Traditional Owner connection to Country and recognises their responsibility to care for their cultural places. The survey and excavation undertaken for this project achieved the primary aim determined by the WWCHAC, which was to understand the heritage values that may have been impacted by the erosion control works. In addition, the project was viewed as an educational opportunity for all participants involved; Wurundjeri community members gained the opportunity to connect to one of their significant cultural sites, and learn from LTU researchers techniques for advanced archaeological investigations, while researchers from LTU gained the opportunity to learn from Wurundjeri Elders information about culture and the history of the site. It is hoped that this project acts as an example of a collaborative method for undertaking archaeological investigations and drives further community-led archaeological projects in Victoria.

The results of the 2018 research activities have provided information about the stone-working activities that were undertaken at Murrup Tamboore, including the nature of the raw materials and how they were used to manufacture tools. The creek-bank stratigraphy has been characterised and age estimates for sediment deposition have been provided, ranging from ~6.5 to ~30 ka for artefact-bearing deposits. These results will now be interpreted in their broader geomorphological context, with the aim of bringing LiDAR datasets together with field observations and the results of previous archaeological investigations in order to determine how this part of the Arundel Creek bank relates to the broader terrace system. Future multidisciplinary research will also seek to generate information about the palaeoecology of the region surrounding Murrup Tamboore, expanding upon the results of the anthracological analysis undertaken by Thomas and King.

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