



Proposed Residential Subdivision
203 and 205 Old Beach Road, Old Beach

Aboriginal Heritage Assessment Report
Final Draft

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29.5.2023

CULTURAL
HERITAGE
MANAGEMENT
AUSTRALIA

Report Version Control

Report version	Report distribution	Date of Distribution
Draft Report V1	Zoe Smith (CHMA for Internal Review)	29.5.2023
Draft Report V1	Proponent for Internal Review	29.5.2023
Final Draft Report V1	Aboriginal Heritage Tasmania	
Final Report V2	Aboriginal Heritage Tasmania	

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Executive Summary

Project Details

JMG are undertaking the planning and approvals process for a proposed residential subdivision at 203 and 205 Old Beach Road, Old Beach in the South East region of Tasmania (see Figure 1). The proposed subdivision (the study area) will be confined to an area encompassing approximately 5.5ha which will be accessed off Old Beach Road. Figures 2 and 3 show the boundaries of the study area. It is proposed that this area will be subdivided into 82 residential lots. Figure 4 shows the proposed subdivision plan.

CHMA Pty Ltd and Rocky Sainty (AHO) have been engaged by JMG to undertake an Aboriginal heritage assessment for the proposed residential subdivision (the study area), in order to identify any potential Aboriginal heritage constraints. This report presents the findings of the Aboriginal heritage assessment.

Registered Aboriginal Sites in the Vicinity of the Study Area

As part of Stage 1 of the assessment process, a search was undertaken of the Aboriginal Heritage Register (AHR) to determine whether any registered Aboriginal heritage sites are located within or in the general vicinity of the Old Beach Road study area. The search shows that there are a total of 37 registered Aboriginal sites that are located within an approximate 2km radius of the study area (search results provided by Reuben West from AHT on the 16.3.2023).

Based on the information provided on the AHR, it appears that none of these 37 registered sites are located within, the bounds of the study area. There are four registered Aboriginal sites that are located within a 200m radius of the study area (sites AH8748, AH12008, AH12009, AH12011). Figure 1 shows the location of these sites. All of these sites were identified and reported on by Entura (2014) as part of the assessment of the surrounding Tivoli Green residential development. The closest registered site to the study area is AH12011 (an isolated artefact), which is situated immediately to the south of the southern boundary of the study area. The other three sites are located between 100m and 200m from the study area boundaries. The detailed AHR search results are provided in section 4.3 of this report.

Summary of Results

The field survey was undertaken over a period of one day (21.9.2022) by Stuart Huys. The field survey was undertaken over a period of one day (13.4.2023) by Stuart Huys (CHMA archaeologist) and Rocky Sainty (Aboriginal Heritage Officer). No Aboriginal sites or suspected features were identified during the field survey assessment of the 203 and 205 Old Beach Road study area. The field survey was able to confirm that there are no stone resources within the study area that would be suitable for stone artefact manufacturing. There are also no potential rock shelter features present in the study area.

As noted previously, the search of the AHR undertaken for this project shows that there are no registered Aboriginal sites that are located within the actual study area

boundaries. The closest registered site to the study area is AH12011, which is classified as an Isolated artefact. The grid reference location provided on the AHR places this site around 8m to the south of the southern boundary of the study area. This matches with the site description provided for the site, which means the grid reference is likely to be accurate. Because this site is located on another private property, outside the study area, the field team could not attempt to relocate the artefact. The team did inspect the southern boundary of the study area closest to the site, but could find no evidence of artefacts extending into this area. Surface visibility along the southern boundary was restricted to around 20%. Based on the available information, it is confirmed that site AH12011 is situated outside the bounds of the study area and is not under any threat of impact from the proposed residential development.

On the basis of the negative survey findings, the absence of registered Aboriginal sites, and the low potential for undetected Aboriginal sites to be present, the study area is assessed as being of low archaeological sensitivity. The detailed survey results and discussions are presented in section 7 of this report.

Management Recommendations

Heritage management options and recommendations provided in this report are made on the basis of the following criteria.

- Consultation with AHO Rocky Sainty.
- Background research into the extant archaeological and ethno-historic record for the study area and the surrounding region (see sections 3 and 4).
- The results of the investigation as documented in this report (see section 7); and
- The legal and procedural requirements as specified in the *Aboriginal Heritage Act 1975* (see section 9).

Recommendation 1

No Aboriginal sites or suspected features were identified during the field survey of the study area at 203 and 205 Old Beach Road. A search of the AHR shows that there are no registered Aboriginal sites that are located within the study area, and it is assessed that there is a low potential for undetected Aboriginal heritage sites to be present. It is therefore advised there are no Aboriginal heritage constraints, or legal impediments to the project proceeding.

Recommendation 2

If, during the course of the proposed development works, previously undetected archaeological sites or objects are located, the processes outlined in the Unanticipated Discovery Plan should be followed (see Appendix 1). A copy of the Unanticipated Discovery Plan (UDP) should be kept on site during all ground disturbance and construction work. All construction personnel should be made aware of the Unanticipated Discovery Plan and their obligations under the *Aboriginal Heritage Act 1975* (the Act).

Recommendation 3

Copies of this report should be submitted to Aboriginal Heritage Tasmania (AHT) for review and comment.



Figure i: Aerial image showing the location of the registered Aboriginal sites located in closest proximity to the study area
(Based on the results of the AHR search dated 16.3.2023)

1.0 Project Outline

1.1 Project Details

JMG are undertaking the planning and approvals process for a proposed residential subdivision at 203 and 205 Old Beach Road, Old Beach in the South East region of Tasmania (see Figure 1). The proposed subdivision (the study area) will be confined to an area encompassing approximately 5.5ha which will be accessed off Old Beach Road. Figures 2 and 3 show the boundaries of the study area. It is proposed that this area will be subdivided into 82 residential lots. Figure 4 shows the proposed subdivision plan.

CHMA Pty Ltd and Rocky Sainty (AHO) have been engaged by JMG to undertake an Aboriginal heritage assessment for the proposed residential subdivision (the study area), in order to identify any potential Aboriginal heritage constraints. This report presents the findings of the Aboriginal heritage assessment.

1.2 Aims of the Investigation

The principal aims of the current Aboriginal Heritage assessment are as follows.

- To undertake an Aboriginal cultural heritage assessment of the proposed subdivision footprint at 203 and 205 Old Beach Road (the study area as shown in Figures 1-3) The assessment is to be compliant with both State and Commonwealth legislative regimes, in particular the intent of the *Aboriginal Heritage Act 1975* and the associated *Aboriginal Heritage Standards and Procedures (June 2018)*.
- Search the Aboriginal Heritage Register (AHR) to identify previously registered Aboriginal heritage sites within and in the general vicinity of the study area.
- Undertake relevant archaeological, environmental and ethno-historical background research to develop and understanding of site patterning within the study area.
- To locate, document and assess any Aboriginal heritage sites located within the study area.
- To assess the archaeological and cultural sensitivity of the study area.
- To assess the scientific and Aboriginal cultural values of any identified Aboriginal cultural heritage sites located within the study area.
- Consult with (or ensure the Aboriginal community representative consults with) Aboriginal organisation(s) and/or people(s) with an interest in the study area in order to obtain their views regarding the cultural heritage of the area.
- To develop a set of management recommendations aimed at minimising the impact of the proposed subdivision of the land on any identified Aboriginal heritage values.
- Prepare a report which documents the findings of the Aboriginal heritage assessment and meets the standards and requirements of the current *Aboriginal Heritage Standards and Procedures* prepared by AHT.

1.3 Project Methodology

A three stage project methodology was implemented for this assessment.

Stage 1 (Pre-Fieldwork Background Work)

Prior to field work being undertaken, the following tasks were completed by CHMA staff.

Consultation with Aboriginal Heritage Tasmania

AHT was contacted and informed that a field survey was to be undertaken for the proposed subdivision at 203 and 205 Old Beach Road. As part of this initial contact a search request of the Aboriginal Heritage Register (AHR) was submitted to AHT in order to ascertain the presence of any previously registered sites in the vicinity of the study area (search request dated 7-3-2023).

The collation of relevant documentation for the project

As part of Stage 1 the following research was carried out and background information was collated for this project.

- A review of the relevant heritage registers (AHR register) and the collation of information pertaining to any registered heritage sites located within the general vicinity of the study area.
- Maps of the study area.
- Relevant reports documenting the outcomes of previous Aboriginal heritage studies in the vicinity of the study area.
- Ethno-historic literature for the region.
- References to the land use history of the study area.
- Geotechnical information for the study area, including soil and geology data.

Consultation with Aboriginal Heritage Officer (AHO)

Rocky Sainty is the AHO for this project. As part of Stage 1 works Stuart Huys (CHMA archaeologist) was in regular contact with Rocky Sainty. The main purpose of this contact was to discuss the scope of the present investigations, to ratify the proposed methodology for the investigations and to co-ordinate the timeframes for implementing field work.

Stage 2 (Field Work)

Stage 2 entailed the field work component of the assessment. The field survey was undertaken over a period of one day (13.4.2023) by Stuart Huys (CHMA archaeologist) and Rocky Sainty (Aboriginal Heritage Officer). The field survey assessment was primarily focused on the 5.5ha study area that is proposed to subdivided. In total, the field team walked an estimated 2.45km of survey transects across the study area, with each transects averaging 5m in width.

The field team also walked a series of 1.35km of 5m wide survey transects across the broader property boundaries, to the north of the study area footprint, in an effort to more accurately gauge the presence or absence of Aboriginal heritage sites that may be present in this landscape. Section 6 provides further details as to the survey coverage achieved by the field assessment.

1.4 Project Limitations

All archaeological investigations are subject to limitations that may affect the reliability of the results. The main constraint to the present investigation was restricted surface visibility due primarily to vegetation cover, and the presence of introduced fill material. Surface visibility across the study area ranged between 5%-70%, with the estimated average visibility being 20%. Vegetation ground cover throughout the majority of the study area was typically quite thick. There were occasional erosion scalds, vehicle tracks and stock tracks present within the study area that provided locales of improved surface visibility. The issue of surface visibility is further discussed in Section 6 of this report.

The results of the field investigation were discussed by Rocky Sainty and Stuart Huys. This included the potential cultural and archaeological sensitivity of the study area, and any management strategies.

Stage 3 (Report Writing)

Stage three of the project involves the production of a Draft and Final Report that includes an analysis of the data obtained from the field survey, an assessment of archaeological sensitivity and management recommendations. The report has been prepared by Stuart Huys in consultation with Rocky Sainty. The report has been structured to comply with the standards and requirements of the current *Aboriginal Heritage Standards and Procedures* prepared by AHT. One electronic copy (PDF version) of the final draft report has been provided Aboriginal Heritage Tasmania (AHT) and the Proponent for review. A draft version of the report has also been provided to key Aboriginal stakeholders for information purposes.



Plate 1: Rocky Sainty, the designated AHO for the Project

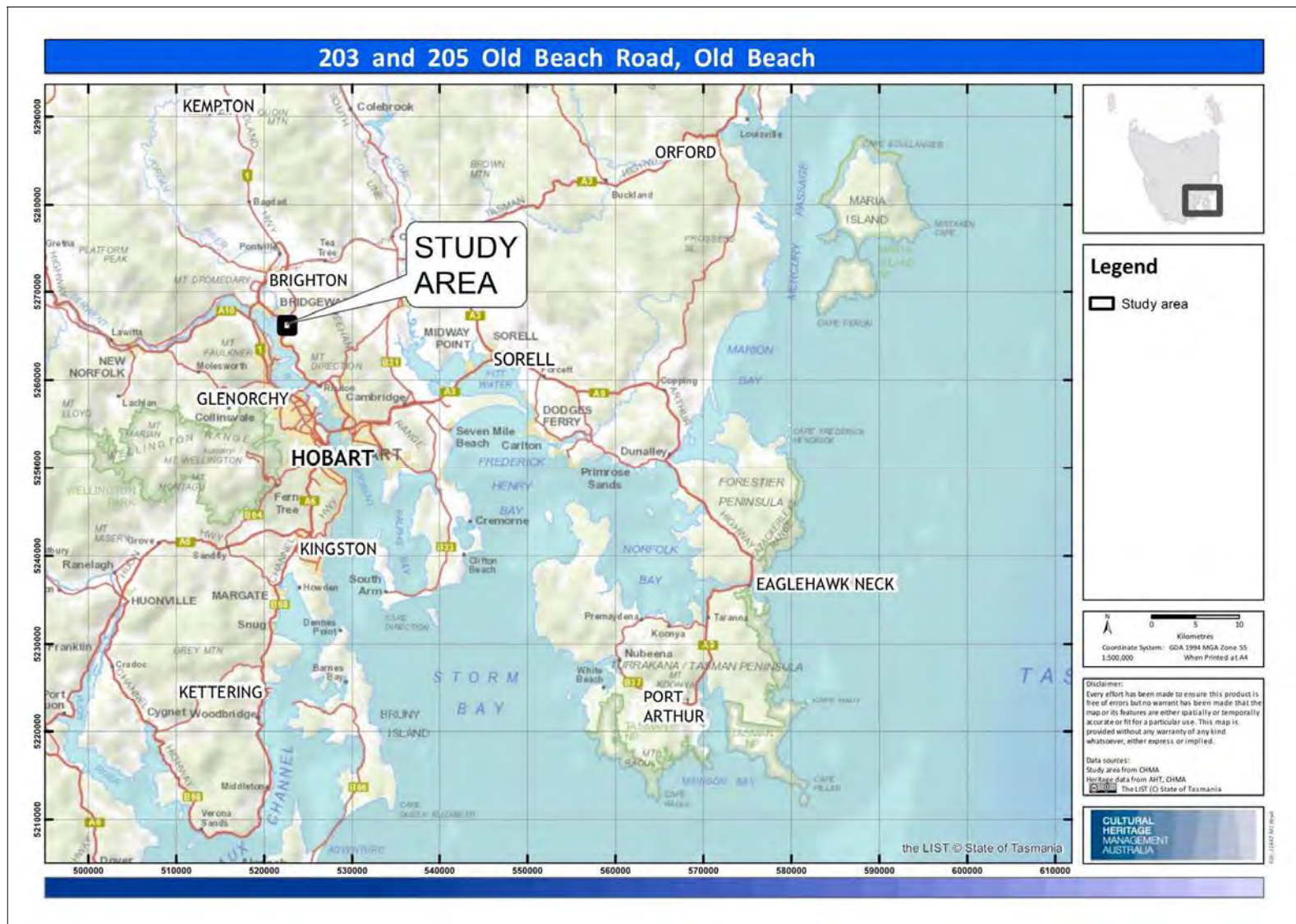


Figure 1: Topographic map showing the general location of the study area at Old Beach in South East Tasmania

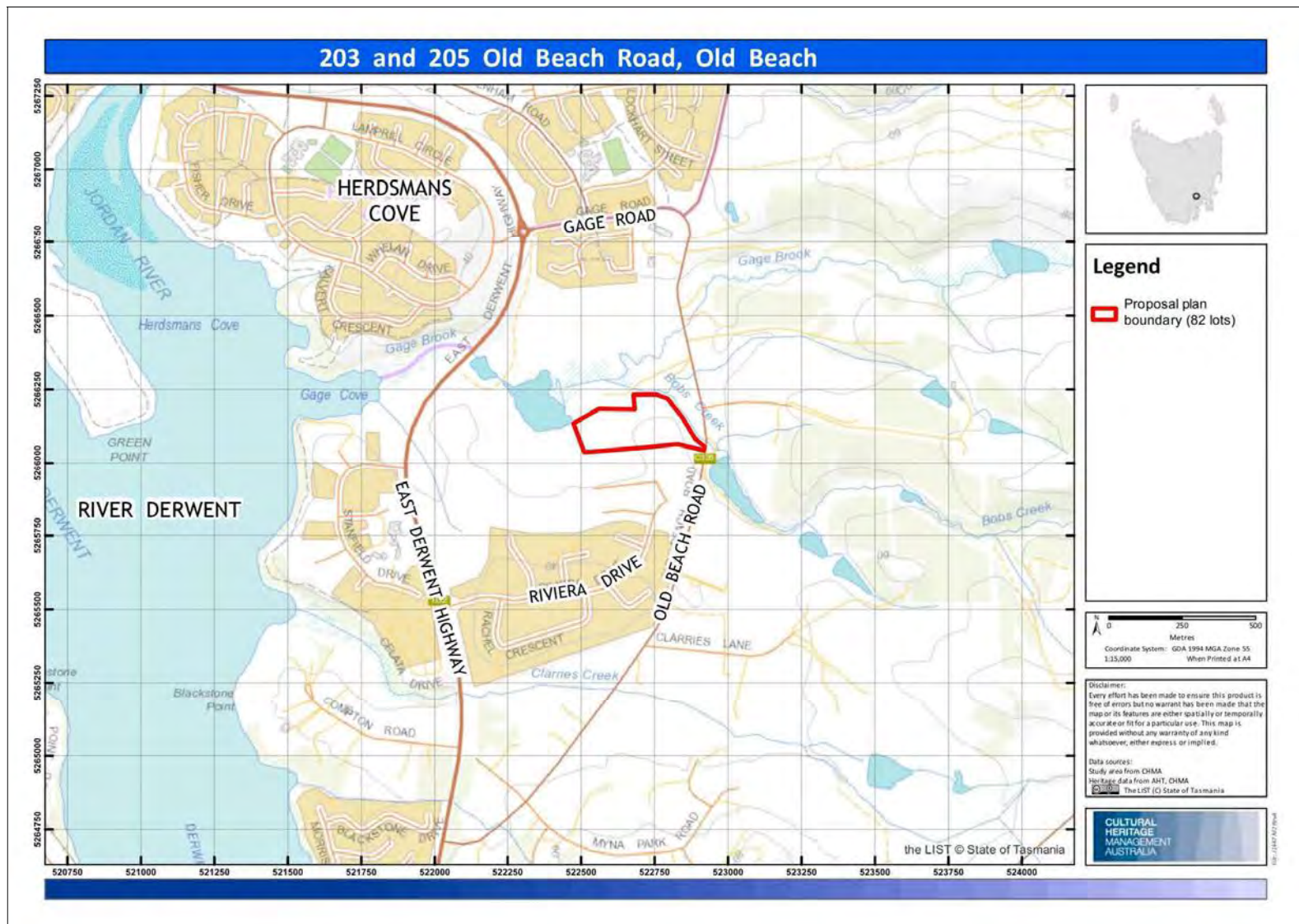


Figure 2: Topographic map showing the boundaries and landscape setting of the study area at 203 and 205 Old Beach Road, Old Beach



Figure 3: Aerial image showing the boundaries of the study area the study area at 203 and 205 Old Beach Road, Old Beach

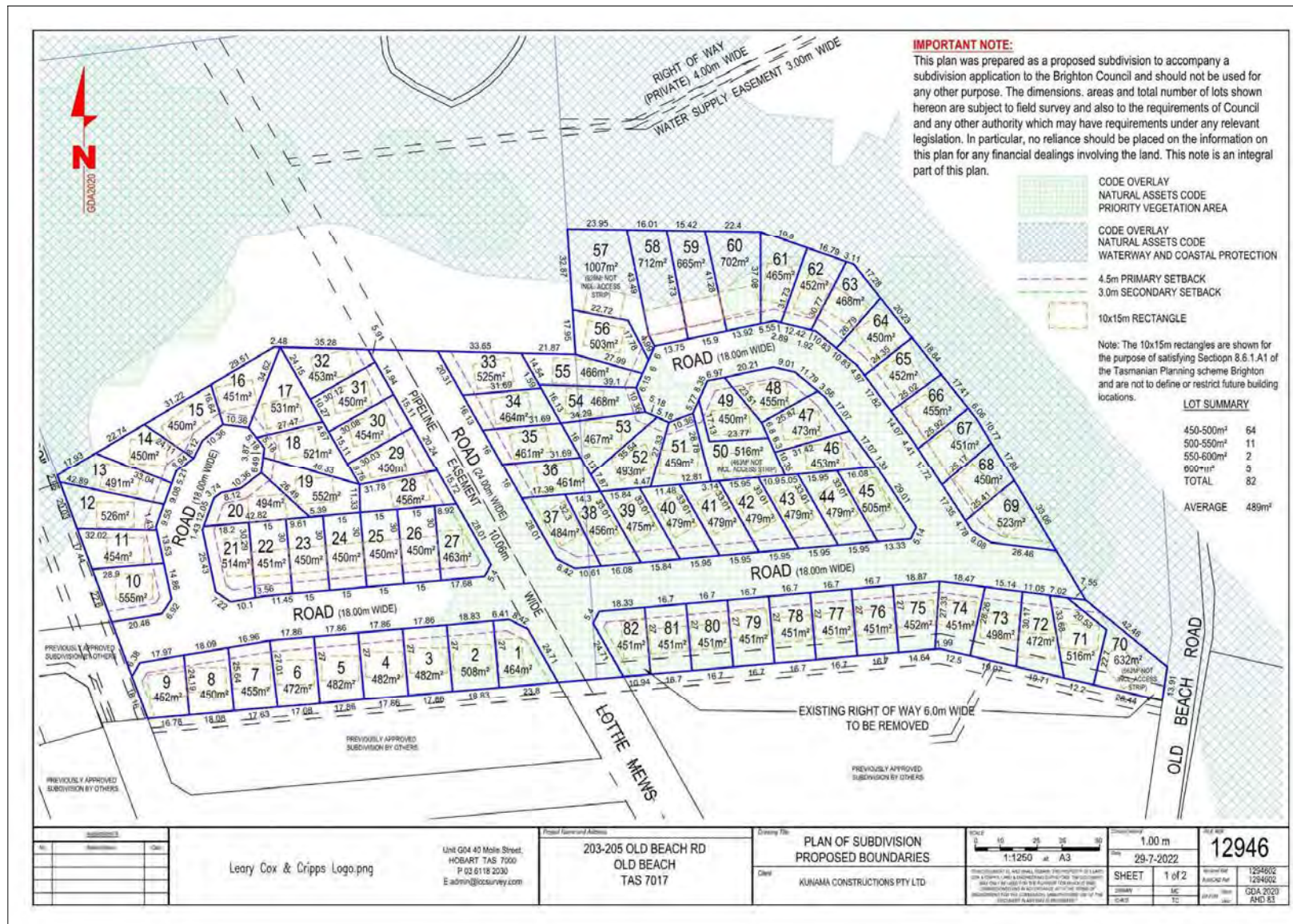


Figure 4: Proposed subdivision plan for 203 and 205 Old Beach Road, Old Beach

2.0 Environmental Setting of the Study Area

2.1 Introduction

Prior to undertaking archaeological survey of the study area, it is necessary to characterise the landscape. This includes considering environmental factors such as topography, geology, climate, vegetation and past and current landscape use. An assessment of the environmental setting helps to develop an understanding of the nature of Aboriginal occupation and site patterning that might be expected to occur across the study area. In addition, it must be remembered that in Aboriginal society, the landscape extends beyond economic and technological behaviour to incorporate social geography and the embodiment of Ancestral Beings.

The archaeological context is generally only able to record the most basic aspects of Aboriginal behaviour as they relate to artefact manufacture and use and other subsistence related activities undertaken across the landscape such as raw material procurement and resource exploitation. The distribution of these natural resources occurs intermittently across the landscape and as such, Aboriginal occupation and associated archaeological manifestations occur intermittently across space. However, the dependence of Aboriginal populations on specific resources means that an understanding of the environmental resources of an area accordingly provides valuable information for predicting the type and nature of archaeological sites that might be expected to occur within an area.

The primary environmental factors known to affect archaeological patterning include the presence or absence of water, both permanent and ephemeral, animal and plant resources, stone artefact resources and terrain.

Additionally, the effects of post-depositional processes of both natural and human agencies must also be taken into consideration. These processes have a dramatic effect on archaeological site visibility and conservation. Geomorphological processes such as soil deposition and erosion can result in the movement of archaeological sites as well as their burial or exposure. Heavily vegetated areas can restrict or prevent the detection of sites, while areas subject to high levels of disturbance may no longer retain artefacts or stratified deposits.

The following sections provide information regarding the landscape context of the study area including topography, geology, soils and vegetation. Much of this information is derived from The LIST – the Tasmanian Government Land Information System.

2.2 Landscape Setting of the Study Area

The study area is located on the properties of 203 and 205 Old Beach Road, Old Beach, in South East Tasmania. The site encompasses approximately 5.5ha and is situated around 1km inland (east) of the mouth of the Jordan River, where it merges with the River Derwent. The Jordan River has its' headwaters at Lake Tiberias, around 40km to the north-east of the study area. From here the river flows in a north-west direction through a broad open valley system, cutting across the Midland

Highway near Jericho. It then enters more steeply incised hills just south of Melton Mowbray, where the river then loops around to the south-east, eventually emptying into the River Derwent at Herdsmans Cove. Cove Hill Bridge generally demarcates the point on the Jordan River where the tidal influence extends to. Immediately to the north of the bridge is a set of rapids, which acts as a physical barrier to the tidal extent. Downstream of the bridge, the Jordan River is subject to tidal influence, with the water being brackish. These lower reaches of the Jordan River are essentially part of the River Derwent estuary system. The River Derwent estuary is a 'ria' or drowned river valley formed by coastal submergence about 6,000 years ago. The closest named water course to the study area is Bob's Creek, which runs along the northern margins of the study area (see Plate 2). This is an ephemeral water course that has its headwaters in the Meehan Ranges to the east, and flows in a westerly direction, joining with Gage Brook just to the north of the study area. Gage Brook then empties into the Jordan River and Gage Cove.

The terrain across the study area is characteristically gently undulating, encompassing a series of a low relief hills on the southern side of Bobs Creek. These hills are part of the western foothills of the Meehan Range. Slope gradients are generally in the range of between 1° and 10°, with the steeper gradients occurring in the north part of the study area, on the hill side slopes leading down to Bobs Creek (see Plate 3).

The underlying geology across the study area and surrounds comprises undifferentiated volcanoclastic, quartz-rich lithic and quartzose sandstone, siltstone, and mudstone associated with the Upper Parmeener Supergroup (TheList 2023). To the west of the study area this transitions to Jurassic dolerite. From an Aboriginal heritage perspective, the rock types present in the study area are typically unsuited for stone artefact manufacturing, being to soft or brittle. The possible exception is if small patches of silicified or metamorphosed material occur within the study area. Soils across the study area are moderate to imperfectly drained black cracking soils, as shown in Plate 4 (TheList 2023).

The native vegetation across the study area has been entirely cleared as part of past pastoral activity. The current vegetation comprises introduced grasses (see Plates 3 and 4).

From an Aboriginal heritage perspective, any sites located within this cleared agricultural land will have been impacted to some extent. Impacts are likely to have been mainly confined to the upper soil horizons (top 40cm) and will have involved the horizontal and vertical displacement of cultural deposits. As such, there is very little potential for in situ sites to occur within the study area.



Plate 2: View north-west along Bobs Creek which runs along the north boundary of the study area



Plate 3: View north-west across the west portion of the study area showing typical topography and cleared farm paddocks



Plate 4: View north-west showing cleared farm paddocks and imperfectly drained black cracking soils that occur across the study area

3.0 Ethno-historic Background

3.1 Aboriginal Social Organisation in Tasmania

Ryan (2012) explains that the terms 'nation' and 'clan' are the preferred terms used by the Tasmanian Aboriginal community in place of 'tribe' and 'band' respectively. This terminology has been adopted in the following discussion. According to Jones (1974), the social organisation of Tasmanian Aboriginal society appears to have consisted of three social units, these being the hearth group, the band (clan) and the tribe (nation). The hearth group was the basic family unit and would generally have consisted of a man and woman, their children, aged relatives and sometimes friends and other relatives. The size of hearth groups would generally range from between 2-8 individuals (Jones 1974: Plomley 1983). Plomley (1983) provides a description made by Peron of a hearth group he encountered at Port Cygnet:

There were nine individuals in this family, and clearly they represented a hearth group, because Peron visited their campsite with its single hut. The group comprised an older man and wife, a younger man and wife, and five children, one a daughter (Oure-Oure) of the older man and wife, and the other four the children of the younger man and wife. (Plomley 1983:168).

The clan appears to have been the basic social unit and was comprised of a number of hearth groups (Jones 1974). Jones (1974:324-325) suggests that the clan owned a territory and that the boundaries of this territory would coincide with well-marked geographic features such as rivers and lagoons. Whilst the clan often resided within its territory, it also foraged widely within the territories of other clans. Brown (1986:21) states that the band was led by a man, usually older than the others and who had a reputation as a formidable hunter and fighter. Brown also suggests that the clan (as well as the hearth group) was ideally exogamous, with the wife usually moving to her husband's band and hearth group.

Each clan was associated with a wider political unit, the nation. Jones (1974:328-329) defines the tribe (or nation) as being:

...that agglomeration of bands which lived in contiguous regions, spoke the same language or dialect, shared the same cultural traits, usually intermarried, had a similar pattern of seasonal movement, habitually met together for economic and other reasons, the pattern of whose peaceful relations were within the agglomeration and of whose enmities and military adventures were directed outside it. Such a tribe had a territory, consisting of the sum of the land owned by its constituent bands...The borders of a territory ranged from a sharp well defined line associated with a prominent geographic feature to a broad transition zone. Jones (1974:328-329)

According to Ryan (2012:11), the Aboriginal population of Tasmania was aligned within a broad framework of nine nations, with each nation comprising between six to fifteen clans (Ryan 2012:14). The mean population of each nation is estimated to have been between 350 and 470 people, with overall population estimates being in the order of between seven to ten thousand people prior to European occupation (Ryan 2012:14).

Ryan (2012:15) presents a map showing the approximate boundaries for the nine Tasmanian Aboriginal Nations. This map shows that the Jordan River, from its mouth through to around St Peters Pass, formed the boundary between two nations, the Oyster Bay Nation and the Big River Nation (see Figure 5). The study area is on the boundary of these two nations, but probably sits within the land of the Oyster Bay Nation.



Figure 5: The location of the study area in relation to Aboriginal Nations of Tasmania (based on map from Ryan 2012:15)

The Oyster Bay Nation occupied the area to the east of the Jordan River, with their territory encompassing around 7800 square km. The Nation consisted of ten bands with an estimated total population of between 700-800 people, making it the largest Nation in Tasmania (Ryan 2012:17). Of the ten clans that comprised the Oyster Bay Nation, it is the Moomairmener that probably occupied the land in the vicinity of Bridgewater.

The area to the west of the Jordan River was believed to have been the Territory of the Big River Nation (Ryan 2012:15 and 26). The territory of the Big River Nation is described by Ryan as extending from around New Norfolk on the Derwent River, south-west through to the rugged Mountains beyond the source of the Derwent River, north to Surrey Hills, then east through the mountains to Quamby Bluff (encompassing all the lake country) and finally south along the Western Tiers and the Jordan River (Ryan 2012:26).

The Oyster Bay Nation

The movement of the Oyster Bay Nation through the landscape is thought to have been largely based on the seasonal availability of food resources. In this sense, the Oyster Bay Nation could be divided into two distinct groups: the northern group (from North Oyster Bay through to St Patricks Head) and the southern group (from Little Swanport through to the Tasman Peninsula) (Ryan 2012:18).



Figure 6: Seasonal movement of the Oyster Bay Nation clans (Ryan 2012:19)

According to ethnographic material, of the ten bands that comprised the Oyster Bay Nation, it is the Moomairremener band from the southern group which probably occupied the land closest to the present study area. The southern Oyster Bay people started to move inland in early spring to hunt and fish. The Moomairremener generally commenced moving inland around September/October, travelling up the Derwent River towards New Norfolk, and across to Abysinia, and from there they would travel along the Clyde and Ouse Rivers. Travel was along well-defined routes, generally along the edges of the Band's territory. The two big attractions of the Big River country were the kangaroo hunting grounds around Great Lake and the Clyde and Ouse Rivers, and the availability of a potentially intoxicating gum procured from the *Eucalyptus gunii* tree. The Moomairremener would begin moving back through the Midlands in late February, early March, eventually returning to the coastal areas around June (Ryan 2012:17-20). These routes are shown in Figure 6.

The Big River Nation

The Big River Nation occupied the central highlands and are estimated to have numbered between four and five hundred people at the time of contact with European settlers (Ryan 2012:26). They were the only Tasmanian nation without access to a coastal strip. However, this was compensated by the highland lakes system, and visiting arrangements with the neighbouring North and Oyster Bay nations (Ryan 2012:19, 28). Through these relationships the Big River people had seasonal access to the east, north and west coasts, and to the ochre sources in the mountains to the north (Ryan 2012:28). The Big River Nation interacted with a greater number of diverse clans and families than any other Tasmanian nation (Ryan 2012:29). This suggests an active and dynamic social unit continually exposed to varying cultures and ideas (see Figure 7).

Travel was via well maintained and regularly used travelling routes. In return, neighbouring nations were granted access to the resources of the highlands in the territory of the Big River Nation. Oyster Bay people are known to have travelled up the Clyde and Ouse River valleys during the summer months to hunt, and to harvest the *Eucalyptus gunii* forests, a tree confined to the highlands that produces an intoxicating gum (Ryan 1996:20). Little is known of movement of clans across the territory of the Big River Nation (Ryan 2012:28). However, there is some evidence that people tended to congregate on the lakeshores, notably at the Great Lake, Arthurs Lake and Lake Echo (see Figure 7; Ryan 2012:17, 28).

The Big River Nation is believed to have comprised of five bands; the Leenowwenne people who lived west of the Derwent River north of New Norfolk, the Pangeringhe who lived on the west bank of the Derwent River just opposite the meeting of the Derwent and Clyde Rivers, the Braylwunyer people who lived on the hilly plains between the Ouse and Dee Rivers, the Larmairrenener people lived in the high country west of the Dee River and the Luggemairnerpainer people who lived north of the Great Lake (Ryan 2012:26). The band that most likely occupied the area around Bridgewater was the Leenowwenne people (Ryan 2012:26).

Ryan (2012:28) states that the Big River and Oyster Bay Nations are thought to have had amicable and co-operative relationships, which included the provision of access

to areas within each other's territorial lands. This being the case, and given that the Jordan River formed the boundary between two groups, the valley system is likely to have been even more intensively frequented and occupied by Aboriginal people than otherwise would have been the case. It is probable that clans from both Nations regularly moved through the valley system as part of their seasonal travels through their territories. Within the valley system, these groups would have had a series of favoured camp locations, where they regularly stayed for short durations. In all probability the camp locations would have been spaced between 5-10km apart (depending on local topography), which would constitute a comfortable days walk apart. The available evidence suggests that these favoured interim camp locations were most probably sited on elevated and level landscape features such as the spines of spur lines, and in close proximity to the Jordan River and its associated resources.

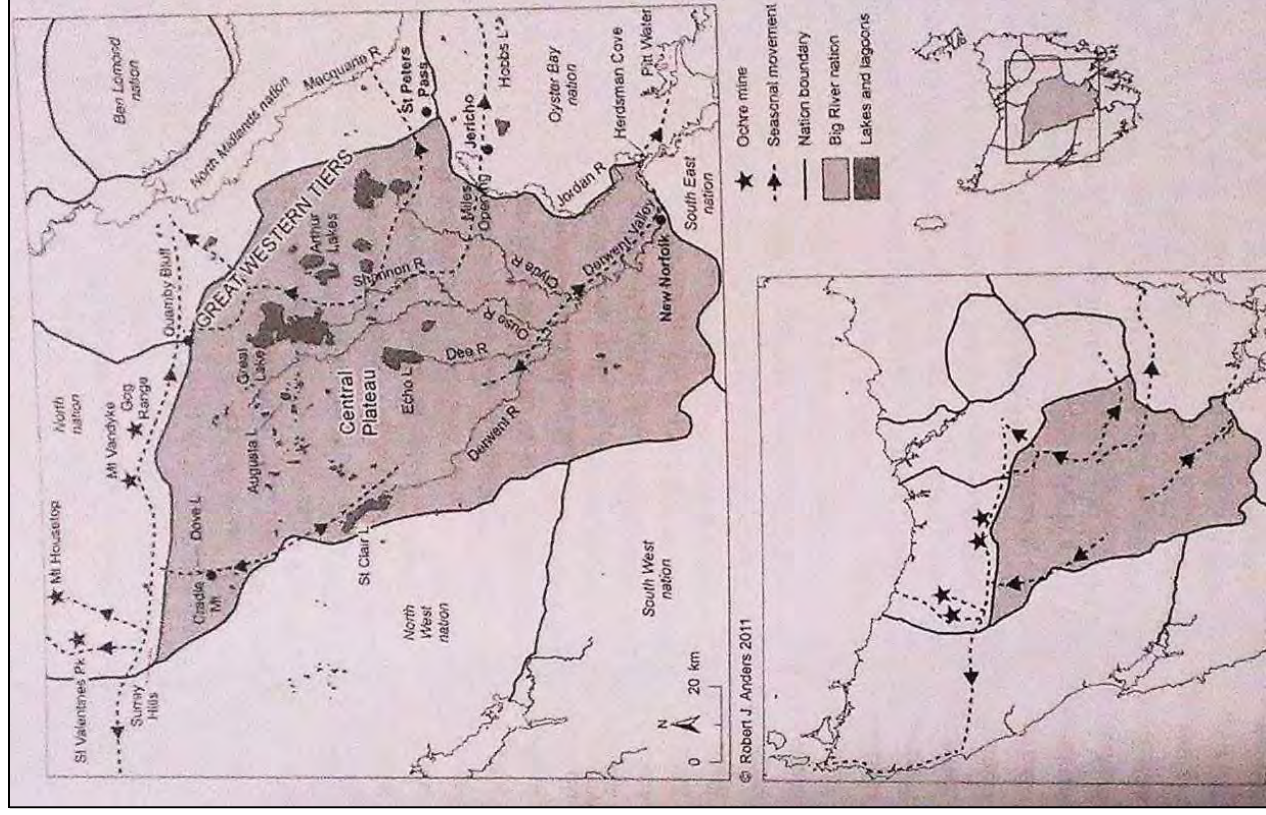


Figure 7: Seasonal movement of the Big River Nation (Ryan 2012:17)

The groups that frequented the Jordan Valley system are also likely to have had a small number of more permanent or 'base camp' locations scattered throughout their territories where they spent weeks at a time. These more permanent campsites would need to be situated in close proximity to a major resource zone, or even at the interface of a series of resource zones in order for the groups to have access to sufficient food water etc. to sustain them for extended periods.

Material Culture, Social Customs and Ethnographic Sources

The ethnographic observations of early European explorers provide a valuable snapshot into aspects of the material cultural and social customs of the Aboriginal Nations inhabiting southeastern Tasmania. Primary among the ethnographic sources are the diaries of George Augustus Robinson, appointed as government Protector of Aborigines who followed a policy of conciliation with the ultimate aim of removing Aboriginal people to offshore islands (Plomley 2008:515). These observations are especially valuable where they describe to those items and practices that do not survive in the archaeological record.

While the early European explorers generally recorded the people of south east Tasmania as being mostly naked, there are references to kangaroo skin being used for capes, slings and binding for wounds. Both William Anderson (Cook's surgeon in 1777 when he anchored briefly in Adventure Bay) and Labillardiere (the 1793 expedition anchored in Recherche Bay) recorded seeing kangaroo skin used to bind injured feet (Dyer 2005:25). This was very effective it would seem as the people were able to keep up with their companions (Dyer 2005:26). Cook also recorded women using kangaroo skin slings to carry children, and there are several illustrations of this in the paintings by Petit and Lasueur from the Baudin expedition (Bonnemains *et al* 1988). The only other type of protective clothing that appears to have been worn on occasion was a sandal type covering worn on the soles of the feet, which was made from kangaroo skin or possibly a piece of bull kelp (Plomley 1983:123)

Ethnographic sources document a range of shelters used in Tasmania. The most common in the southeast were simple windbreaks of thick strips of bark woven together and supported on vertical wooden poles, as in the artwork from the Baudin expedition (Bonnemains *et al* 1988). Robinson reported seeing huts that were decorated with symbols he recognised as similar to those observed in rock engraving sites at Cape Grim (Plomley 2008:17). In June 1804 Lieutenant Governor Collins made contact with Aboriginal people living on the Huon River (Plomley 2008:18). He recorded an 'Aboriginal village' with about twenty families congregated at the site.

Burial customs were also observed by the ethnographers. Cremation was the usual form of disposing of a deceased person (Plomley 2008:17). Illustrations from the Baudin expedition show 'tombs' at Maria Island (Bonnemains *et al* 1988:131). These were bark tepee-like constructions built over remains that have been covered in fibres or leaves weighted down by rocks (Bonnemains *et al* 1988:131). Robinson also recorded that bones of the deceased, or ash from the cremation, was sometimes carried by relatives as an amulet (Plomley 2008:17).

Robinson recorded that Aboriginal people in the south east would travel along ‘well beaten paths’ and leave abalone shells at drinking places along rivers (Plomley 2008:59). He also recorded an instance of trying to convince his Aboriginal companions to eat fish, and the strong reluctance they demonstrated (Plomley 2008:59).

Plomley (1983:185-194) provides a comprehensive account of the weapons and implements used by the Tasmanian Aborigines, based on the ethnographic accounts. It appears that the two main weapons used by the local inhabitants were the spear and the club. The spear was a simple flexible rod with a point at one end, the length of which appears to have varied significantly from between 6-12 feet. The club is described as a piece of wood about 60cm long, 2.5cm in diameter and slightly tapered toward the gripping end. This item is reported to have been used as a throwing stick as well as a club.

Plomley (1983:22) also makes reference to the use of a wooden spatula which was used primarily for removing shellfish from rocks.

In many of the early ethnographic accounts for the Southeast region, there is reference to the baskets carried by the Aboriginal people, however often there is very little detail regards their construction. One of the more detailed descriptions comes from Robinson (in Plomley 1966:58), while he was on Bruny Island.

“The native basket is made of rushes of a species of grass called iris. In preparing them for use they place the same on a slow fire which gives them a tenacity that enables the manufacturer to twist them into threads. These are plaited together and then formed into a basket which in shape is somewhat semiglobular.”

There also a number of reports of water vessels constructed from the fronds of giant kelp which could hold up to five to ten litres of water (see Labillardiere 1800:190).

There are numerous ethnographic accounts for the Southeast region describing the watercraft used by the local inhabitants. One of the most detailed descriptions comes from Louis Freycinet, an officer on the Naturalist in 1802 (in Plomley 1983:119-120).

We have seen them and have measured several. They had the same dimensions and were constructed in exactly the same way. Three roles of the bark of the eucalypt made up its whole structure... These bundles when taken separately, resemble in a way the yard of a vessel, were joined at their ends, and this caused them to stick up in a point and make up the whole of the canoe. The assemblage was made quite firm with a sort of grass or sedge. In this state, the craft had the following dimensions-

Length inside 2.95m

Breadth outside 0.89m

Total height 0.65m

Depth inside 0.22m

Size at the ends 0.27m

The [group] can put five or six peoples in these canoes; but more commonly only three or four are taken at a time. Their paddles are plain pieces of

wood...Usually they sit down to manoeuvre their canoes; in that case they place bundles of grass to serve as seats. At other times they stand up. We have seen them cross the Channel only in fine weather. One can imagine that such a fragile and imperfect craft would never be able to make their way, let alone keep afloat, in a rough sea...It is to be noted that they always put a fire at one end of their canoes, and to prevent the fire from spreading they place under it a bed of earth or ashes of sufficient thickness.

Interestingly, although stone artefacts dominate the archaeological record for Tasmania (and Australia generally), there are few ethnographic accounts in Tasmania documenting their use. Those observations that are made, primarily relate to the finding of stone implements at campsites. Frustratingly, there are virtually no accounts regarding the form of the implements, how they were made, and what they were used for.

Robinson (in Plomley 1966:113) reports that he

“Obtained a stone from one of the Bruny natives with which they sharpen their waddies...It has the resemblance of flint and is found at the Isthmus of Brune..”

One of the very few descriptions of Aboriginal people carrying out quarrying activity comes from Raynor (in Roth 1899:151) who recounted that his father had come across about 20-30 Aboriginal people, men, women and children, at a quarry near Plenty on the southern side of the middle Derwent Valley.

Noisily chatting, they were breaking the stone into fragments, either by dashing them on the rocks or by striking them with other stones, and picking up the sharp edged ones for use...

This quarry was subsequently visited by Rhys Jones, who noted that the quarried material was an indurated cherty hornfels and that the quarry extended over an area of about 2 ½ hectares (Jones 1971:456).

Ethnographic observations of the Oyster Bay Nation specifically are quite common. Large gatherings of Aboriginal people assumed to be of the Oyster Bay Nation have been recorded in the ethnographic records. McGowan (1985:92) reports that in May 1804 a large group of Aborigines, variously estimated to be up to 500 individuals, including men women and children were observed hunting kangaroo near the first European settlement at Risdon Cove.

Robinson noted that a Mr Earl related ‘...that he had seen as many as 500 in one mob together, i.e. the Coal River mob.’ (Robinson in Plomley 1966:595).

One of the earliest and more comprehensive descriptions of the Oyster Bay people comes from Lieutenant Le Dez who was a member of the Marion du Fresne expedition of 1772. The following account was written after he encountered Aboriginal people from the Oyster Bay Nation at Forester Peninsula at North Bay.

Their usual height is 5 ½ feet, their colour very much approaches rust, but they rub themselves with black and make patterns in the form of a crescent on their bodies with this colour: their hair is cottony; they have very little beard, very white teeth, large, harsh features and a wild appearance. In general they are badly built with thin bodies and slender legs and thighs. They speak with a singular vivacity and we were unable to distinguish any sounds other than these: la-ga – la-ga. I compared them with the inhabitants of New Holland of whom Dampier speaks. They appear to me widely dispersed or wandering like them in bands or in families and the fires we have often seen along the coast are probably the places where each band stops. They must naturally prefer places near the sea and in coves because of the ease with which they can find their sustenance there. I think they are seafood eaters because we found many places in the woods where they had stopped. One notices easily the place where they slept around a mound of ash and one sees, nearby, fish bones and many burnt shells. It appears that they are always naked and among those that we saw there was one that had a skin belt with long hairs and another had a white feather in his hair: was that a mark of distinction or an ornament. The women we saw only from a distance; they always stayed on the edge of the woods ready to run away (and) seemed to have as their only clothing a piece of skin which covered their breasts and reached to their thighs. I think they must suffer very much during the winter, which must be long and hard, because I do not think they have other ways of fending off the cold than by lighting fires. Thus they appreciate fire very much and when I saw them come to meet our sailors and offer them fire it occurred to me this element was the one they held most useful; it was a sign of friendship to offer it to us. Perhaps they behave in this way among themselves when they meet. We noticed that most of them, besides their spears and a few stones, carry a firebrand as well and each time they stop, and it is often only for a moment, they make a fire and gather round it. It is astonishing how many places we have found where they have lit a fire and how much the woods are devastated by it. We have seen few trees that were not injured at the foot and it was the same throughout the whole bay. We have covered almost all of it without encountering inhabitants or any of their retreats. It was only on the island in the NNE that we found a few pieces of bark, badly arranged with one end resting on a piece of wood set crosswise and the other on the ground; that formed, if you wish, a kind of hut. It seems that they had not long left it; one can conjecture from that that they make similar ones and we did not penetrate sufficiently into the woods to encounter them and that it is for that purpose or to make ropes (because we found a piece that was quite well twisted) that there are numerous trees that we saw stripped of their bark to a height of five or six feet... We have found nothing that could make us suspect that they have canoes or rafts... Their spears are nothing other than sticks about six feet long, pointed at the thick end. They are not poisoned at all... (Le Dez in Cox 2010:18-19).

Subsistence and Economy

There are a number of other ethno-historic accounts that comment on the prevalence of shellfish and crustaceans in the diet of the local inhabitants (see Plomley 1966 and

1983), and the archaeological evidence (in the form of midden sites) provides tangible testimony to this. However, the ethnographic and archaeological evidence for the consumption of fish is comparatively very sparse. This has led to some suggestions that fish was not a component of the diet of the Tasmanian Aborigines (see Jones 1974).

Robinson provides an account of the ‘chief’ Mannalargennana of the Oyster Bay Nation cooking wallaby.

“...The animal is first thrown on the fire whole as is their custom with all animals, and when the hair is singed they take the carcase off the fire and rub off the scorched hair with their hands. This practice is tenaciously observed with all animals except the possum; the fur of this animal is first pulled off previous to its being placed on the fire. After the chief has rubbed the hair off the wallaby, he broke the fore leg by twisting it with his hands...He then cut the hind legs, after which he made a hole in the belly with his fingers and pulled out the entrails and then thrust in some hot ashes, the animal being previously roasted outside...” (Robinson in Plomley 1966:548-549).

Possum also seems to have been frequently hunted. Plomley (1966:533) describes possums being knocked down out of trees with waddies, or trees were climbed to reach possum holes.

Unfortunately, there are very few accounts available for the hunting of other terrestrial fauna, however, it is likely that a much wider range of species were targeted, including echidna and smaller marsupials. Certainly within the midlands region, birds and eggs appear to have also formed a major component of the diet of the local inhabitants, with swans, ducks and red bills being some of the main species targeted (Plomley 1966:217). However, there are very few accounts available for the south-east Tasmanian region, for the hunting of birds and the gathering of eggs. Nonetheless, it would be reasonable to assume that this also was carried out at certain times of the year.

Only a few plant foods are documented in the ethohistoric accounts as having been eaten. This includes a bulbous plant known as ‘native bread’ and a plant that has the appearance of asparagus which was found by the roots of peppermint trees (Plomley 1966). It is very likely that many more plant foods were eaten by the local Aboriginal population. Jones (1971:91-95) for example lists 70 edible plant species that are available in Tasmania and are likely to have been consumed at times of seasonal availability. This would include pig face, tree ferns, fern roots and a variety of seaweeds.

3.2 Cultural Contact and Frontier Violence

In the first years of the settlement at Hobart the surrounding areas became vital hunting grounds supplying kangaroo meat to the struggling colony on the brink of starvation (Alexander 2006:5). Hunting parties could be away from Hobart for months at a time, and would have needed to learn how to survive in the Tasmanian bush.

The economic importance of the kangaroo hunters to the success of the colony cannot be over emphasised. Without the supply of kangaroo meat the government would have been unable to meet the rations and maintain the settlement (Boyce 2009:52). However, the reliance of the colonisers on kangaroo brought them into direct conflict with the Aboriginal people. Access to seasonal kangaroo hunting grounds was central to the economies of both the Big River and Oyster Bay Nations.

At first, the Europeans were at an advantage as they had hunting dogs that greatly increased the numbers of kangaroo that a hunter could kill (Boyce 2009:52). The Aboriginal people quickly adapted to the use of dogs, an example of rapid cultural and economic adaptation. This brought the two groups onto a more even par (Boyce 2009:66). This period of parity only lasted while the European population was small; as early as 1806 the kangaroo populations around Hobart had been decimated and the hunters were being forced to move further north, towards the Brighton district (Boyce 2009:54). The settlement was literally starving, and there was a strong economic imperative for hunters to extend to the north in search of fresh sources of game. As the settlement continued to expand, both the colonists need for a meat supply, and their transformation of the hunting grounds into cleared, pastoral farms set the scene for an escalation in conflict (Boyce 2009).

Clashes with Aboriginal communities became more frequent and more violent as European settlement expanded. Lieutenant-Governor George Arthur proclaimed Martial Law in November 1828, leading to the active pursuit, capture and death of many Aboriginal people. A bounty was introduced in February 1830 of five pounds for every adult captured and two pounds for each child. In the two years between November 1828 and November 1830 some twenty Aboriginal people were captured and a further sixty lost their lives (Ryan 2012:102).

A series of six 'roving parties' were established for the purposes hunting and capturing the remaining Aboriginal occupants of the settled areas. This military action resulted in a general increase in the scale of violent conflict between Europeans and Aboriginal people, and by 1830 it was decided that a full-scale military offensive was required in order to quell the Aboriginal uprising. This operation, termed the 'Black Line,' involved the assembly of 2000 men in October 1830, who formed a human chain that swept through the settled districts over a period of three weeks, with the aim of driving the remnant Aboriginal populations from these areas. At the time the military campaign was widely believed to have achieved its objectives, with virtually the entire Aboriginal population having been either killed, or driven out of the settled areas. In 1832 the proclamation of Martial Law was revoked (Ryan 2012:112-113).

The Black Line was Governor Arthur's response to repeated insistence from settlers that Aboriginal people should be removed from the midlands (Alexander 2006:15). This reflects the level to which conflict had reached by 1830. Over three weeks two thousand settlers formed a line across the midlands, attempting to drive Aboriginal people south onto the Tasman peninsula (Alexander 2006:15). The line passed through Brighton in October 1830; no Aboriginal people were captured in the district (Alexander 2006:16).

Whilst the Black Line itself proved to be a dismal failure, with the total capture of two Aborigines and death of another three, it was sufficiently distressing to the general Aboriginal community that more than two hundred people subsequently allowed themselves to be persuaded by George Augustus Robinson (the ‘Protector of Aborigines’) to relocate to Flinders Island in exchange for food, shelter and safety (Lines 1991:47). They were further promised that they would be returned to their former homes on the Tasmanian mainland as soon as possible.

By 1835, the majority of the 220 Aborigines who arrived with Robinson at the Wybalenna Aboriginal establishment on Flinders Island had died from inadequate shelter, insufficient provisions and introduced disease. Birth rates were extremely low and few children survived infancy. In 1847 six Aborigines at Wybalenna made a petition to Queen Victoria asking that the promises made to them be honoured. In October 1847, the surviving 47 Aborigines were transferred to their final settlement at Oyster Cove (only 44 people survived the trip).

Conditions at Oyster Cove were only marginally better than at Wybalenna and the Aboriginal population continued to experience high mortality rates. However, throughout the 1850s and 1860s the European settlers recorded numerous anecdotes of Aboriginal people at Oyster Cove maintaining elements of their pre-contact lifestyle (AT 2010:26). They hunted, performed ceremonies and continued making traditional cultural items. The best known example is Fanny Cochrane who married ex-convict William Sawyer. She is reputed to have practiced traditional shellfish gathering, basket making, medicine and religious practices (AT 2010:27).

The Oyster Cove station closed in 1862. For most of the next 100 years, parts of the former station land were sold, while some remained as Crown land. In 1981, the majority of the former station area was proclaimed as a Historic Site. Despite strong opposition, the Aboriginal community reoccupied the site on 16 January 1984. Each year since occupying the putalina site, the Tasmanian Aboriginal Corporation has held an annual music and cultural festival (AHT fact sheet accessed 2021).

In 1995, the State Government formally handed the title of Oyster Cove putalina to the Aboriginal Land Council of Tasmania. The site continues to be managed by the Tasmanian Aboriginal Corporation. Today, the putalina festival attracts hundreds of people each January to enjoy local and interstate musicians, cultural activities and interactions with extended family and community (AHT fact sheet accessed 2021).

4.0 Background Archaeology

4.1 Regional Studies

The study area is within the South-East region of Tasmania. There have been a number of Aboriginal archaeological studies undertaken within the south-east region over the past two decades. The majority of these have been in the form of survey assessments associated with proposed development activities, and have focused on discreet areas (these are summarised in section 4.2) However, there has also been some broader research based investigations undertaken in the region. Probably the most comprehensive of these and the one most pertinent to the present investigations are that of Officer (1980) and Brown (1986).

Officer (1980)

Iain Officer (1980) carried out an extensive survey of the Derwent Estuary region, as part of his thesis works. The areas covered by the survey investigations extended from Blinking Billy Point (west bank of River) and Trywork (east bank of River), upstream to New Norfolk. The survey assessment in this area involved walking a series of survey transects along the shoreline of the River, with transects in some areas extending up to 1km inland from the River.

In the course of his investigations, Officer recorded a total of 416 midden sites. Of these, 298 were located on the east bank of the River and 118 on the west bank (Officer 1980).

The shell midden sites identified by Officer were predominantly comprised of mussel (*Mytilus planulatus*, *Xenostrobus securus* or *Brachidontes rostratus*) and oyster (*Ostrea angasi*). A wide range of other shell fish species were represented in low numbers at a number of these sites (Officer 1980).

Stone artefacts were observed at 33 of the recorded midden sites (28 artefacts on the east bank and 5 artefacts on the west bank). A wide range of stone material types were represented in these artefact assemblages, including cherty hornfels, silicified breccia, mudstone, chalcedony, quartz, basalt and dolerite (Officer 1980).

Bone material was observed at only four midden site locations, indicating that for whatever reason, bone material in middens on the Derwent River is a rare occurrence (Officer 1980).

One of the areas intensively surveyed by Officer (1980) was Bedlam Walls, which lies on the east side of the Derwent River, between Geilston Bay and Risdon Cove and extends up to 1.2km inland from the shore of the River. Officer (1980) recorded a total of 74 sites in this area (sites AH 1184-1257). The vast majority of sites are classified as middens, however, three stone quarries and one rock shelter was also identified. A large number of the midden sites (28%) are described as being extensive, covering in excess of 1000m², with the largest site being over 8000m² (Officer 1980). The midden sites range from being located immediately on the shore line through to up to 530m inland from the shore. The dominant shell material

represented in these midden sites was the black mussel (*Mytilus planulatus*) and oyster (*Ostrea angasi*).

Officer (1980) notes that a local resident (Dr Jacklyn) also recorded a large number of Aboriginal sites in the Bedlam Walls area, in the period between 1965-1973. The sites recorded by Officer (1980) included those site identified by Dr Jacklyn. Officer identified an additional 19 midden sites to those identified by Jacklyn. As part of his recording efforts, Dr Jacklyn carried out an extensive salvage of stone artefacts in the Bedlam Walls area. Jennings (1983) subsequently undertook an analysis of this collection. Jennings (1983) reports that of the 1016 pieces of stone material collected by Dr Jacklyn, 991 pieces are determined as being stone artefacts, giving an average artefact density for the area of 381 artefacts/km². The majority of artefacts were collected from the shoreline area between Shag Bay and Geilston Bay (641 artefacts). Of the 991 artefacts, 633 were un-worked and 358 are worked. Stone material types represented in the assemblage include hornfels, quartzites, chalcedony and sub-basaltic hornfels (Jennings 1983).

Brown (1986)

Steve Brown (1986) was engaged to carry out the South East Tasmanian Archaeology Project. This was one of nine regional overview studies, funded through National Estate grants, which were directed at examining the Aboriginal archaeological resources of Tasmania. The aims or duty statement for the South East Tasmanian Archaeology Project was to define the prehistory of the region and to define present and potential future impacts on the Aboriginal heritage resources in the region.

As part of his research design, Brown (1986:49-50) divided the landscape of the south-east region into landform unit types. Five major landform unit divisions were identified. These were;

- small offshore islands,
- Bruny Island,
- coastal and estuarine environments (consisting of coastal margins, coastal plains, river estuaries, lagoons and swamps),
- inland hills, plains and river valleys, and
- inland mountains (alpine plateau).

Brown (1986:49-50) then collated available archaeological data for these landscape units, including the range of site types present, the site components and the distribution and frequency of sites. The data was generated from previous archaeological investigations undertaken in the region, as well as the findings from the field work carried out by Brown.

The field survey investigations implemented by Brown (1986:50-52) involved a selective sampling procedure, where block surveys were undertaken at three designated areas, these being Bruny Island, the Coal River, and Bothwell. In addition, more general survey assessments were carried out at a variety of locations. Of the five landscape units identified by Brown (1986), the most pertinent to the present investigations are the coastal and estuarine environments and the Inland

Hills, Plains and River Valleys zone. The following provides an overview of the findings, as presented by Brown (1986) for these two landform units.

Inland Hills, Plains and River Valleys

This landscape unit was the largest of the five unit divisions established by Brown (1986) for the South-east Tasmanian region. It is also the most pertinent landscape unit in relation to the present investigation, as the study area lies within a River valley system.

Brown (1986:93-97) reports that open artefact scatters are the most common site type identified in the Inland Hills, Plains and River Valley zone. The greatest number of these sites is reported as occurring on the valley and creek floors and the foot slopes adjoining these areas. It appears that site and artefact densities appear to be comparatively much lower on mid and upper hill slopes and on ridges and crests. The largest artefact scatters (those comprising over 50 artefacts) have a number of site location factors in common. They are all situated on well drained sandy soils. They are in slightly elevated positions above river and creek floodplains. They usually have a northerly aspect, and finally the sites are generally situated in close proximity to a fresh water source. For medium and small sized artefact scatters there appears to be no distinct pattern of distribution (Brown 1986:93-97).

The range of stone artefacts identified at sites in this zone includes the debris of stone artefact manufacturing and maintenance (fragments, flakes, flake fragments, flaked pieces and cores). Retouched stone artefacts include a large variety of scrapers. Unmodified cobbles have also been identified at a range of sites. The reduction of stone material appears to have occurred mainly at the source location. Backed artefacts appear to absent from the site assemblages in this zone, and in South-east Tasmania in general, and pebble choppers appear to be rare (Brown 1986:94).

Numerous stone quarry/procurement sites have been identified in the Inland Hills and Plains zone. These sites range in size from areas where a few boulders of cobbles have been flaked through to extensive sites such as the Oyster Cover quarry site. The quarried stone material types include silcrete, quartzites, cherty hornfels, chalcedony and silicified breccia (Brown 1986:95).

Sandstone rock shelters and overhangs are common in the Inland hills and Plains zone. In the majority of instances artefacts are not found on the shelter floor surfaces. Brown (1985:94) postulates that this may be due to accelerated depositional rates in sandstone shelters. Paintings have been recorded at two sandstone rock shelters, with both occurring near Ellendale in the upper Derwent Valley (Brown 1985:97).

Interestingly, Brown (1986:96) reported that no ochre sources, ochre quarries, or stone arrangements had been identified in this zone.

Coastal and Estuarine Regions

The Coastal and Estuarine Regions consists of coastal margins, coastal plains, river estuaries, lagoons and swamps. It encompasses the Derwent River.

Brown (1986:79) notes that shell middens are by far the most common site type occurring within the coastal and estuarine environmental zone. A number of trends were observed in relation to the distribution of this site type within the coastal and estuarine environmental zone, and the composition of materials at these sites. These are summarised as follows.

- Middens are generally not present in areas with steep shore profiles.
- The greatest number of middens was identified on coast lines which contain a mixture of rocky headlands and short sandy beaches (mixed coast areas).
- On long sandy beaches the volume of midden material was found to decline with distance from a rocky coast.
- Middens are essentially comprised of two types; rocky coastal and bay estuarine, reflecting different landscape settings. However, middens with shell species common to both these types occur in intermediate zones such as estuary and lagoon mouths.
- The largest rocky coastal shell middens occur on rocky headlands and points, with associated rock platforms, where abalone, turbo, mussels and limpets occur.
- The bay estuarine type middens are generally composed predominantly of mussel and oyster shellfish species. The largest middens are found immediately adjacent to the shoreline, near to the shell fish resources. A few sizeable middens have been noted up to 500m inland, with smaller middens having been identified up to 1km inland.
- Shell middens in South-east Tasmania are comprised almost entirely of shell, and rarely contain large numbers of stone artefacts or faunal remains (Brown 1986:79-82).

Overview for the South-East Tasmanian Region

In summary, Brown (1986:99-102) has identified the following broad patterns of site type distribution in South-East Tasmania.

- Aboriginal archaeological sites occur in all parts of the landscape.
- The coastal margins (including off shore islands), coastal plains and river estuaries are very rich in archaeological resources and contain a high density of sites with large quantities of archaeological remains. The Derwent Estuary in particular was an area of rich archaeological resources.
- Inland sites are dominated by open artefact scatters and isolated artefacts. Artefact densities are highest along the river, rivulet and creek valley floors and adjacent to lower hill slopes, particularly where the hill slopes are gently inclined, with a north aspect, and have sandy well drained soils.
- Shell middens most frequently occur in close proximity to shellfish resources, particularly on cliff tops or headlands where there is easy access to these resources.
- Stone artefact quarries most frequently occur where there is a surface expression of geological contact zones, in particular between Jurassic dolerite and Triassic or Permian strata.

As a general statement, Brown (1986:102) summarises that site numbers and densities in South-east Tasmania are greatest within 300m of the present coastline and in the immediate vicinity of coastal lagoons.

In terms of environmental factors determining site location, Brown (1986:103) is of the opinion that topography is perhaps the most consistent and important factor. Sites in general, but particularly the larger ones (in terms of artefact numbers) are very seldom found on steep gradient slopes.

In terms of duration of Aboriginal occupation, Brown (1986:99-100) believes that the South-eastern Tasmanian region has probably been occupied by Aboriginal people for the past 20 000 years. However, he acknowledges that there are no conclusive dates for sites beyond 6000 years old for the region. Pleistocene dates have however been obtained for sites in close proximity to the region (Beginners Luck Cave and a cave on the Weld River).

4.2 Previous Aboriginal Heritage Assessments Undertaken in the Vicinity of the Study Area

There have been a large number of Aboriginal heritage assessments undertaken within the general vicinity of the study area. Most have these have been undertaken as part of the planning processes for specific infrastructure projects, such as the Brighton Bypass and Brighton Transport Hub projects. The following provides a summary review for those assessments that are most relevant and in closest proximity to the study area.

Assessments of the Brighton Bypass undertaken by Stanton (2008a), CHMA (2008a, Everett 2008, Stone and Everett 2009)

Development of the Brighton Bypass was divided into two, with the northern and southern portions of the bypass meeting at the point of the proposed Bagdad Bypass route easement.

The original heritage assessment for the southern portion of the Bypass was undertaken by Stanton (2008a) and resulted in the identification of a single isolated find (AH 10713). Subsequent investigations by CHMA (2008a) resulted in the discovery of an additional 6 sites (AH10801-10806). Five sites (5) were identified as small artefact scatters (comprising between 2 and 6 artefacts each) and the sixth was an isolated artefact. In addition, a number of areas of potential archaeological sensitivity were identified based on the presence of surface artefacts, presence of soil depth, lack of/minimal disturbance or modification and landform type. Sub-surface investigations in these areas recovered additional artefacts in 5 out of 120 test-pits, located on the following landform types:

- Two sites were found on gentle to moderating hill side slopes (with a 2 to 5 degree incline)
- Two sites were found flat to very gently sloping saddle areas
- One site was identified in the bed of a creek line.

Densities elsewhere along the route were found to be generally low, with increased densities only noted around saddles and creek lines.

Five Aboriginal sites were identified by Everett (2008) during his heritage assessment of the northern portion of the Brighton Bypass. These sites comprised 3 isolated finds and 2 artefact scatters, however Everett thought it possible that the three isolated finds represented extensions of the largest scatter identified comprising 30-40 artefacts. The second scatter comprised 12 artefacts and was located off Rifle Range Road.

During the follow up assessment Stone and Everett (2009) relocated 3 previously recorded sites (AH 7464, 8676 and 9158) and 7 new sites (AH 10755 to AH10761). AH 7464 is a silcrete stone procurement source with 2 artefacts found in association with the outcrop. AH 8676 (one of the scatters identified by Everett in 2008) was found to be a far more extensive scatter than was first recorded extending some 1km to the south of Rifle Range Road. Stone and Everett (2009) recorded the site as a silcrete procurement and reduction site, located on a massive Tertiary sand body. The third site, AH 9158 is also recorded to be a reduction site, comprising 23 artefacts and extending along a wide sand-sheet sitting parallel to and 150m east of the Bagdad Rivulet. The additional seven previously unrecorded sites comprised 5 scatters and 2 isolated finds and occur within the Jordan River Valley.

Site 10757 was described as an extensive artefact scatter located on an alluvial flat on the west side of the Jordan River. The site was believed to potentially comprise stratified sub-surface artefact deposits and has now been subject to sub-surface testing (see below). Site 10758 is described as an extensive artefact scatter extending along a 500m section of a ridge line overlooking the Bagdad Valley. Site 10759 is an artefact scatter, comprising five artefacts, located on a hill slope beneath the crest of a basalt ridge line, overlooking a Tertiary palaeo-valley of the Jordan River. Site 10760 is reported as being an extensive surface scatter of stone artefacts located on a strath terrace of Bagdad Rivulet, north of Rifle Range Road. Finally, site 10761 is described as an extensive surface scatter of stone artefacts (60 artefacts), including a raw material source (chalcedony outcrop) located on a basalt ridge top at the confluence of the Bagdad Rivulet and an ephemeral tributary stream.

Test Excavations at Site 10757 (the Jordan River Levee) by Paton 2010

Test excavations were carried out at site AH 10757, or more commonly known as the Jordan River levee site, by Rob Paton in 2010. Original site descriptions included a surface scatter of stone artefacts on a floodplain landscape on the west bank of the Jordan River, near Brighton 30km north of Hobart (Stone and Everett 2009). The floodplain landscape consists of several geomorphic features, one of which is a levee bank deposit. The surface artefact scatter identified by Stone and Everett (2009) as AH 10757, is primarily, but not entirely, associated with the levee deposit.

The levee bank deposit was assessed by Stone and Everett (2009) as having the potential to contain a deeply stratified cultural sequence. As such, controlled excavation of a targeted sample of the levee deposit, the Jordan River Levee (JRL) site, was recommended. This testing programme was to be undertaken in collaboration with the Tasmanian Aboriginal community represented by an Aboriginal Heritage Officer (AHO).

Sub-surface investigations revealed the existence of stone artefacts to a depth of about 70 centimetres below the surface. Average artefact densities equated to approximately 70 artefacts per square metre of excavated deposit. A total of 1403 stone artefacts were recovered from the excavations.

The age of the levee and the length of Aboriginal occupation at the site was determined via Optically Stimulated Luminescence (OSL), which records the last time sunlight fell on the sandy deposits before being covered. The OSL dates for the levee ranged between $26,600 \pm 2.6$ ka to $37,500 \pm 3.8$ ka. Age-depth curves provide a date for the bottom of the levee and the artefacts in these sediments of about 41,000 years. This is reported as the oldest site in Tasmania, and amongst the oldest in Australia (Paton 2010). Moreover, the analysis of the sediments indicated that the part of the levee that contains the archaeological material was mostly undisturbed (apart from the upper plough zone). This being the case then the site has the potential to allow for the identification and analysis of individual living floors and events from the distant past. As Paton (2010) states, this is almost unheard of from an open air site, anywhere in the world. Most sites with this potential are cave deposits that often reflect only a very small and specialised part of the lives of people.

Horses Head (Huys 2009)

Stuart Huys conducted an archaeological survey of a 45ha parcel known as the Horses Head, on the eastern side of the Jordan River, midway between Brighton and Bridgewater. A total of seven archaeological sites were identified in the course of this assessment. Huys interpreted these results as reflecting moderate to high densities of artefacts occurring across the elevated, level spurline that dominated the Horses Head study area (Huys 2009:). The potential for subsurface artefacts to occur was highlighted by Huys. The level portions of the spur line, and the termination of the spur just above the river were identified as the points of highest archaeological potential.

Of the seven recorded sites, four sites were recorded as isolated artefacts, and three as artefact scatters. AH 10900, 10901, 10903 and 10906 were all recorded as isolated artefacts (Huys 2009:28-29). AH 10902 is an artefact scatter consisting of five artefacts across the basal portion of the broad spur line. This site is located approximately 100m north east of the Jordan River. The second recorded artefact scatter is AH 10904, an extensive scatter of over 100 artefacts. The site extends for approximately 275m along the NE-SW line of the spur. The highest density of artefacts at AH 10904 correlated with the point at which the spur line is broadest and level (Huys 2009:28). The third recorded artefact scatter at the Horses Head is AH 10905, comprising 24 artefacts on the south west, basal slopes of the spur line above the Jordan River.

Huys noted that a thick deposit of wind blown sand across the upper portions of the spur line and top of the hill provided the opportunity for sub-surface archaeological material to be present. Two discreet flaking floors were identified, indicating that remarkably low levels of disturbance have occurred on the hill summit (Huys 2009:30). The Horses Head is interpreted by Huys (2009:30) as likely to have

operated as a focal point of Aboriginal activity in the Jordan River Valley. This site may well have operated in tandem with the Jordan River Levee site, excavated after the survey at Horses Head.

Brighton Waste Water Treatment Plant (Jones 2012)

Archaeologist Mike Jones and Aboriginal Heritage Officer Leigh Maynard undertook a survey of the Brighton Waste Water Treatment Plant (WWTP) on behalf of Sinclair Knight Merz. The study area was located at Cove Hill Road, Honeywood and Andrew Street, about 2km south of the Brighton town centre (Jones 2012:1).

Two previously unrecorded sites were identified at the Brighton WWTP in the course of this assessment, AH11450 and AH11451. AH11450 was recorded as a small artefact scatter located in a highly disturbed context. AH11451 was recorded as an isolated artefact (Jones 2012:38-41). AH11449 was recorded along the proposed rising main. This site is recorded as an isolated artefact (Jones 2012:43).

Jones (2012:51) interpreted these results as reflecting a 'background scatter' of isolated artefacts and small artefact scatters surrounding two repeatedly occupied camp sites: AH 10757 (the Jordan River Levee) and AH7022. However, the high level of disturbance across the study area was also noted by Jones as likely to have obliterated some of the archaeological evidence of Aboriginal occupation of this area (Jones 2012:51.)

Brighton to Bridgewater Optical Fibre Cable Route (Paton 1994)

Rob Paton (archaeologist) conducted a survey of the Brighton to Bridgewater optical fibre cable route in 1994. The survey route followed the foothills along Cove Hill Road, crossed the Jordan River just north of Cove Bridge, and then traversed the rolling plains and hills south of Brighton (Paton 1994:1). The three sites identified by Paton (1994) were considered to be representative of sporadic use of the landscape by Aboriginal people moving between the coastline and inland resources (Paton 1994:10).

The survey led to the recording of three small artefact scatters, AH 7022, 7023 and 7024. AH 7022 is a small artefact scatter consisting of eight flakes (six chert and two quartzite). The site is located on a sandy deposit on the southern side of the Jordan River valley (Paton 1994:23). AH 7023 is an isolated artefact, a chert single platform core, located 400m south east of the Jordan River (Paton 1994:24). The third site, AH 7024, is a small artefact scatter consisting of three quartzite flakes. This site was recorded on east facing slopes about 500m south east of the Jordan River.

Bridgewater to New Norfolk Optical Fibre Cable Route (Paton 1995)

The following year, Paton returned to survey the Bridgewater to New Norfolk optical fibre cable route. The route followed the undulating hills between Bridgewater and New Norfolk, with a crossing of the Derwent River near Boyer (Paton 1995:4).

Two Aboriginal cultural heritage sites were identified during this survey. AH 7173 was recorded as an isolated artefact on the north facing slopes of the Derwent River Valley (Paton 1995:22.) The site consists of a single chert flake. The second

recorded site, AH 7174, is a small artefact scatter located on a raised knoll on the southern edge of the Derwent River Valley. This site comprised eight flakes, including seven chert and one fine grained volcanic flake (Paton 1995:23).

No Aboriginal heritage sites were identified. The high levels of disturbance identified across the study area were the main reason attributed to the lack of Aboriginal heritage sites identified during this survey (Stanton 2000).

Maynard and McConnell 2003

Anne McConnell and Leigh Maynard were engaged to undertake an Aboriginal heritage assessment for a proposed natural gas pipeline development in the Greater Hobart region. The assessment focused on an off take station which was located approximately 2km north of Bridgewater, and the distribution pipeline which extended south to the centre of Hobart, via a section of this pipeline ran from Bridgewater to Old Beach, following the alignment of the East Derwent Highway.

The survey assessment did not identify any Aboriginal heritage sites or areas of cultural heritage value either on or in the immediate vicinity of the investigated areas. Apart from the Hobart City Centre, there were no areas where there was considered to be an elevated potential for sub-surface Aboriginal heritage deposits to be present Maynard and McConnell 2003:11).

Sainty 2007

Rocky Sainty was engaged by the Brighton Council to carry out an Aboriginal heritage assessment for a proposed walking track between Old Beach and Bridgewater. A section of this track runs through the current study area.

The survey resulted in the identification of two Aboriginal sites (AH1372 and AH1335), with sites having been previously recorded and registered. Site AH1372 is classified as a shell midden deposit, which was located at the Green Point Nature Reserve, on the west side of Herdsmans Cove. Site AH1335 was also classified as a shell midden, and is located within the coastal reserve at Swan Park, Gagebrook, on the eastern side of Herdsmans Cove.

CHMA (2013)

CHMA (2013) was engaged by Boral to undertake an Aboriginal heritage assessment for a 25ha subdivision proposal on Boral land located immediately to the east of the Midland Highway, with Cove Hill Road delineating the southern boundary. This is just to the west of the current study area.

During the course of the field survey CHMA (2013) identified a total of seven Aboriginal sites were identified. Five of these sites were classified as isolated artefacts, with the remaining two sites being small artefact scatters, each comprising less than five artefacts. CHMA (2013:61) was of the opinion that give the very shallow soil deposits it was very unlikely that there were any significant deposits of sub-surface artefacts associated with any of these sites. CHMA (2013:61) noted a strong correlation between the distribution of the seven recorded sites and the variation of geology and soils across the study area. All seven sites were located

within the portion of the study area where the sandstone conglomerates occur, with the soils in this area being skeletal gravels that have been derived from the bedrock.

CHMA 2017

CHMA (2017) was engaged by the Brighton Council to undertake an Aboriginal heritage assessment for the replacement of the existing Cove Hill Bridge over the Jordan River, which is located approximately 1.5m to the east of the current study area. During the course of the field survey assessment, the field team recorded one Aboriginal heritage site (site AH13314), which was classified as an artefact scatter, comprising two stone artefacts. The site was located on the east bank of the Jordan River, on the upstream side (north side) of the Cove Hill Bridge, approximately 15m from the bridge foundations (CHMA 2017).

Entura 2014

Most recently, Entura (2014) was engaged to undertake an Aboriginal heritage assessment for the proposed Tivoli Green residential development at Gagebrook. This area encompassed around 62.6ha. and borders the southern and western boundaries of the current Old Beach Road. The assessment resulted in the recording of four Aboriginal sites, all of which were new recordings (sites AH12008-AH12011). Site AH12008 was a small artefact scatter comprising two artefacts, site AH12010 was a small deflated shell midden and sites AH12009 and AH12011 are both isolated artefacts. Entura also attempted to relocate and report on a previously registered Aboriginal site in the area of investigation (AH8748). Entura describes that a thorough search was made of the general area around AH8748, under excellent ground visibility conditions and only two possible artefacts were observed within 50m of the recorded location of TASI 8748, both being unmodified concave flakes of brecciated chert (volcaniclastic breccia), which may equally be plough flakes. Overall, Entura noted that there was no readily identifiable pattern of site distribution across the study area (Entura 2014:28-29).

4.3 Registered Aboriginal Sites in the Vicinity of the Study Area

As part of Stage 1 of the assessment process, a search was undertaken of the Aboriginal Heritage Register (AHR) to determine whether any registered Aboriginal heritage sites are located within or in the general vicinity of the Old Beach Road study area.

The search shows that there are a total of 37 registered Aboriginal sites that are located within an approximate 2km radius of the study area (search results provided by Reuben West from AHT on the 16.3.2023). Table 1 provides the summary details for these 37 sites, with Figure 8 showing the reported location of these 37 sites in relation to the study area, based on information generated from the AHR. The vast majority of these sites are classified as shell middens (32 sites), with four of these shell middens also having stone artefacts in association with the midden deposit. The remaining site are classified as either artefact scatters (3 sites), or isolated artefacts (2 sites).

Based on the information provided on the AHR, it appears that none of these 37 registered sites are located within, the bounds of the study area. There are four

registered Aboriginal sites that are located within a 200m radius of the study area (sites AH8748, AH12008, AH12009, AH12011). All of these sites were identified and reported on by Entura (2014) as part of the assessment of the surrounding Tivoli Green residential development. These sites are highlighted in red in Table 2, with Figure 9 showing the location of the four sites in relation to the study area boundaries.

The closest registered site to the study area is AH12011 (an isolated artefact), which is situated immediately to the south of the southern boundary of the study area. The artefact was described as a retouched chert flake that was situated on the mid-slope east flank of a broad flat-topped sandstone ridge overlooking a narrow gully drained by a tributary of Gage Brook (Bobs Creek). The other three registered sites are all situated between 100m and 200m of the study area boundaries (sites AH8748, AH12008 and AH12009).

Table 1: Summary details for registered Aboriginal sites in the general vicinity of the 203 and 205 Old Beach Road study area (Based on the results of the AHR search dated 16.3.2023)

AH Number	Site Type	Grid Reference (GDA94) Easting	Grid Reference (GDA94) Northing
176	Artefact Scatter, Isolated Artefact	521712	5265282
12008	Artefact Scatter	522512	5266486
12009	Isolated Artefact	522401	5266308
12010	Shell Midden	522137	5266314
12011	Isolated Artefact	522874	5266043
1317	Shell Midden	521568	5264676
1318	Shell Midden	521523	5264798
1319	Shell Midden	521512	5264882
1320	Shell Midden	521422	5264974
1321	Shell Midden	521406	5264995
1322	Shell Midden, Artefact Scatter	521378	5265059
1323	Shell Midden	521342	5265140
1324	Shell Midden, Artefact Scatter	521320	5265208
1325	Shell Midden, Artefact Scatter	521541	5265216
1326	Shell Midden	521448	5265445
1327	Shell Midden	521417	5265603
1328	Shell Midden	521412	5265682
1329	Shell Midden	521522	5266118
1330	Shell Midden	521553	5266126
1331	Shell Midden	521812	5266182
1332	Shell Midden	521606	5266290
1333	Shell Midden	521528	5266356
1334	Shell Midden	521479	5266548
1335	Shell Midden	521449	5266607
1336	Shell Midden	521339	5266702
1337	Shell Midden	521247	5266742

AH Number	Site Type	Grid Reference (GDA94) Easting	Grid Reference (GDA94) Northing
1338	Shell Midden	521021	5266929
1339	Shell Midden	521044	5267253
1367	Shell Midden	520844	5266549
1368	Shell Midden	520944	5266395
1369	Shell Midden	521051	5266227
1370	Shell Midden	521028	5266171
1371	Shell Midden	520829	5266101
1372	Shell Midden	520761	5266266
7859	Shell Midden, Artefact Scatter	522012	5265082
8748	Artefact Scatter	522212	5265982
13167	Shell Midden	521900	5266433

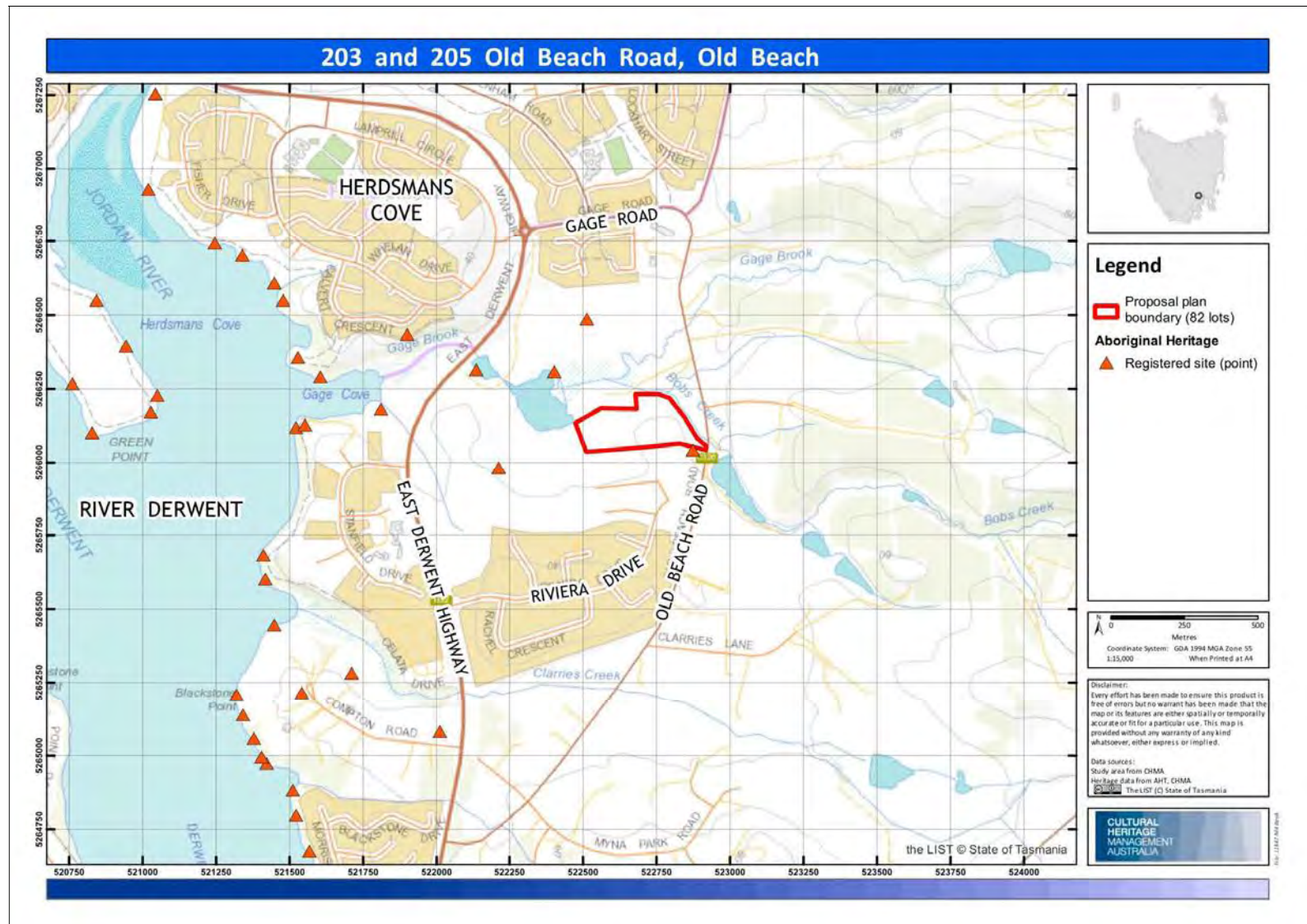


Figure 8: Topographic map showing the location of registered Aboriginal sites within a 2km radius of the study area
(Based on the results of the AHR search dated 16.3.2023)



Figure 9: Aerial image showing the location of the registered Aboriginal sites located in closest proximity to the study area
 (Based on the results of the AHR search dated 16.3.2023)

5.0 Predictive Modelling

5.1 Introduction to Predictive Modelling

Predictive modelling, in an archaeological context, is a fairly straightforward concept and has been utilised by archaeologists in Australia for a number of years as a tool for undertaking research into Aboriginal heritage sites. In summary, predictive modelling involves the collation of information generated from previous archaeological research in a given region, and using this information to establish patterns of Aboriginal site distributions within the landscape of that particular region. On the basis of perceived patterns of site distribution, archaeologists can then make predictive statements regarding the potential for various Aboriginal site types to occur within certain landscape settings, and can make preliminary assessments regarding the potential archaeological sensitivity of landscape types within a given region.

5.2 Predictive Models; Strengths and Weaknesses

It should be acknowledged that most, if not all predictive models have a number of potential inherent weaknesses, which may serve to limit their value. These include, but may not be limited to the following:

- 1) The accuracy of a predictive model is directly influenced by the quality and quantity of available site data and information for a given region. The more data available and the greater the quality of that data, the more likely it is that an accurate predictive model can be developed.
- 2) Predictive modelling works very well for certain types, most particularly isolated artefacts and artefact scatters, and to a lesser extent scarred trees. For other site types it is far more difficult to accurately establish distribution patterns and therefore make predictive modelling statements. Unfortunately, these site types are generally the rarer site types (in terms of frequency of occurrence) and are therefore generally the most significant sites.
- 3) Predictive modelling (unless it is very sophisticated and detailed) will generally not take into account micro-landscape features within a given area. These micro features may include (but is certainly not limited to) slight elevations in the landscape (such as small terraces) or small soaks or drainage depressions that may have held water. These micro features have been previously demonstrated to occasionally be focal points for Aboriginal activity.
- 4) Predictive modelling to a large extent is often predicated on the presence of watercourses. However, in some instances the alignment of these watercourses has changed considerably over time. As a consequence, the present alignment of a given watercourse may be substantially different to its alignment in the past. The consequence of this for predictive modelling (if these ancient water courses are not taken into account) is that predicted patterns of site distributions may be greatly skewed.

5.3 A Predictive Model of Site Type Distribution for the Study Area

The findings of previous archaeological investigations undertaken in the general vicinity of the study area and the information generated from the AHR search, shows that shell middens are by far the most common Aboriginal site type recorded in the general surrounds of the study area corridor. Artefact scatters and Isolated artefacts are also a common site type recorded in the general surrounds of the study area. These the most likely site types to be present in the study area. Aboriginal stone quarry/procurement sites and Aboriginal rock shelters have also been recorded within the broader study area surrounds, and it is therefore possible (although less likely) that these site types may also be encountered. The following provides a definition of these site types and a general predictive statement for their distribution within the study area.

Shell Midden Sites

Definition

Middens range in thickness from thin scatters to stratified deposits of shell and sediment up to 2m thick. In addition to shell which has accumulated as food refuse, shell middens usually contain other food remains such as bone from fish, birds and terrestrial animals and humus from the decay of plant and animal remains. They also commonly contain charcoal and artefacts made from stone, shell and bone.

Predictive Statement

In the South-East Tasmanian region, the largest middens are found immediately adjacent to the shoreline, near to the shellfish resources, and are on elevated, generally gently sloping or level terrain. A few sizeable middens have been noted up to 500m inland, with smaller middens having been identified up to 1km inland. Shell midden deposits are most likely to be encountered within 100m of the foreshore margins of the River Derwent Estuary. The shell middens are likely to be comprised primarily of mussel and oyster species, and stone artefacts are unlikely to be in association, or present in low numbers.

The study area is located around 1km inland from the River Derwent estuary. Given this distance from the littoral zone, it is unlikely that shell midden sites will be present in the study area. If middens are present, they would most probably be small, discrete expressions.

Artefact Scatters and Isolated artefacts

Definition

Isolated artefacts are defined as single stone artefacts. Where isolated finds are closer than 50 linear metres to each other they should generally be recorded as an Artefact Scatter. Artefact scatters are usually identified as a scatter of stone artefacts lying on the ground surface. For the purposes of this project, artefact scatters are defined as at least 2 artefacts within 50 linear metres of each other. Artefacts spread beyond this can be best defined as isolated finds. It is recognised that this definition, while useful in most instances, should not be strictly prescriptive. On some large landscape features for example, sites may be defined more broadly. In other instances, only a single artefact may be visible, but there is a strong indication that

others may be present in the nearby sediments. In such cases it is best to define the site as an Isolated Find/Potential Archaeological Deposit (PAD).

Artefact scatters can vary in size from two artefacts to several thousand, and may be representative of a range of activities, from sporadic foraging through to intensive camping activity. In rare instances, campsites which were used over a long period of time may contain stratified deposits, where several layers of occupation are buried one on top of another.

Predictive Statement:

Previous archaeological research in the region has identified the following pattern of distribution for this site type:

- Stone artefact scatters are numerous within the larger river valley systems;
- The largest open artefact scatters tend to be situated on well-drained sandy soils, in slightly elevated positions above river and creek floodplains, with a north aspect;
- Site and artefact densities on the lower lying flood plains of watercourses tend to be comparatively lower. This may be reflective of the fact these low lying areas were less favoured as camp locations, due to such factors as rising damp and vulnerability to flooding; and
- Site and artefact densities also tend to be comparatively lower in areas away from watercourses, and on moderate to steeply sloping terrain.

The study area encompasses a series of low relief hills, with the terrain being gently to moderately undulating. The closest water course to the study area is Bobs Creek (an ephemeral watercourse), which flows along the north boundary of the study area. Based on the site distribution patterns noted above, site and artefact densities across the study area are likely to be low, representing more sporadic activity. It is unlikely that larger artefact scatters, representing more intensive activity (such as favoured camp locations) will be present.

Stone Procurement/Quarry Sites

Definition

A stone procurement site is a place where stone materials were obtained by Aboriginal people for the purpose of manufacturing stone artefacts. Quarry sites on the other hand have some evidence of the stone being actively extracted using knapping and/or digging. Stone procurement sites are often pebble beds in water courses (where there may be little or no evidence of human activity) or naturally occurring lag deposits exposed on the surface. Quarry sites are usually stone outcrops, with evidence of knapping and pits dug to expose the rock. Concentrations of hammer stones and a thick layer of knapping debris are often present.

Predictive Statement

The underlying geology across the study area and surrounds comprises undifferentiated volcanoclastic, quartz-rich lithic and quartzose sandstone, siltstone, and mudstone associated with the Upper Parmeener Supergroup (TheList 2023). To the west of the study area this transitions to Jurassic dolerite. From an Aboriginal

heritage perspective, the rock types present in the study area are typically unsuited for stone artefact manufacturing, being to soft or brittle. The possible exception is if small patches of silicified or metamorphosed material occur within the study area. This is difficult to predict for.

6.0 Survey Coverage of the Study Area

Survey Coverage and Surface Visibility

Survey coverage refers to the estimated portion of a study area that has actually been visually inspected during a field survey. Surface Visibility refers to the extent to which the actual soils of the ground surface are available for inspection. There are a number of factors that can affect surface visibility, including vegetation cover, surface water, built structures and the presence introduced gravels or materials. Figure 10 provides a useful guide for estimating surface visibility across a given area.

The field survey was undertaken over a period of one day (13.4.2023) by Stuart Huys (CHMA archaeologist) and Rocky Sainty (Aboriginal Heritage Officer). The field survey assessment was primarily focused on the 5.5ha study area that is proposed to subdivided. In total, the field team walked an estimated 2.45km of survey transects across the study area, with each transects averaging 5m in width. This equates to a survey coverage of 12 250m². Surface visibility across the study area was variable. The western portion of the study area had been heavily grazed at the time of the survey and grass cover was short and quite sparse, with numerous erosion scalds present. Surface visibility across this western portion averaged around 50%, which is in the medium range (see Plates 5 and 6). Around 1.2km of the transects were focused in this area. In contrast, surface visibility across the east portion of the study area was restricted to around 10%, which is in the low range (see Figure 10). Grass cover was high and thick in this area (see Plate 7) and visibility was mainly restricted to occasional erosion scalds (see Plate 8).

The field team also walked a series of 1.35km of 5m wide survey transects across the broader property boundaries, to the north of the study area footprint, in an effort to more accurately gauge the presence or absence of Aboriginal heritage sites that may be present in this landscape. Surface visibility across this area averaged around 40%, with erosion scalds and vehicle tracks providing locales of improved visibility (see Plate 9). Figure 11 shows the alignment of transects walked by the field team.

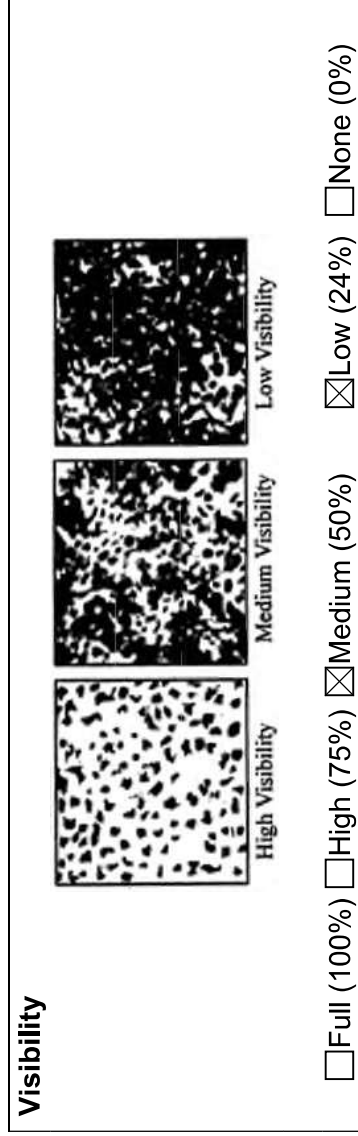


Figure 10: Guidelines for the estimation of surface visibility

Effective coverage

Variations in both survey coverage and surface visibility have a direct bearing on the ability of a field team to detect Aboriginal heritage sites, particularly site types such as isolated artefacts and artefact scatters, which are the two site types most likely to

be encountered in the study area. The combination of survey coverage and surface visibility is referred to as effective survey coverage. Table 2 presents the estimated effective survey coverage achieved during the course of the survey assessment of the study area. The table shows that while the team covered an area of 19000m², the effective coverage was reduced to 6325m². This level of effective coverage is deemed to be sufficient for the purposes of generating a reasonable impression as to the extent, nature and distribution of Aboriginal heritage sites across the study area.

Table 2: Effective Survey Coverage achieved within the study area

Area Surveyed	Transects Walked	Estimated Surface Visibility	Effective Survey Coverage
West portion of study area	1200m x 5m = 6000m ²	50%	3000m ²
East portion of study area	1250m x 5m = 6250m ²	10%	625m ²
Broader surrounds	1350m x 5m = 6750m ²	40%	2700m ²
Total	3800m x 5m = 19000m ²		6325m ²



Plate 5: View north across the west portion of the study area showing typical levels of surface visibility at around 50%



Plate 6: View west across the west portion of the study area showing typical levels of surface visibility at around 50%



Plate 7: View west across the east portion of the study area showing typical surface visibility at under 10%



Plate 8: View east at an area of improved visibility (30%) in the east part of the study area



Plate 9: View north across the area on the north side of Bobs Creek (outside the study area) showing typical levels of visibility at 40%

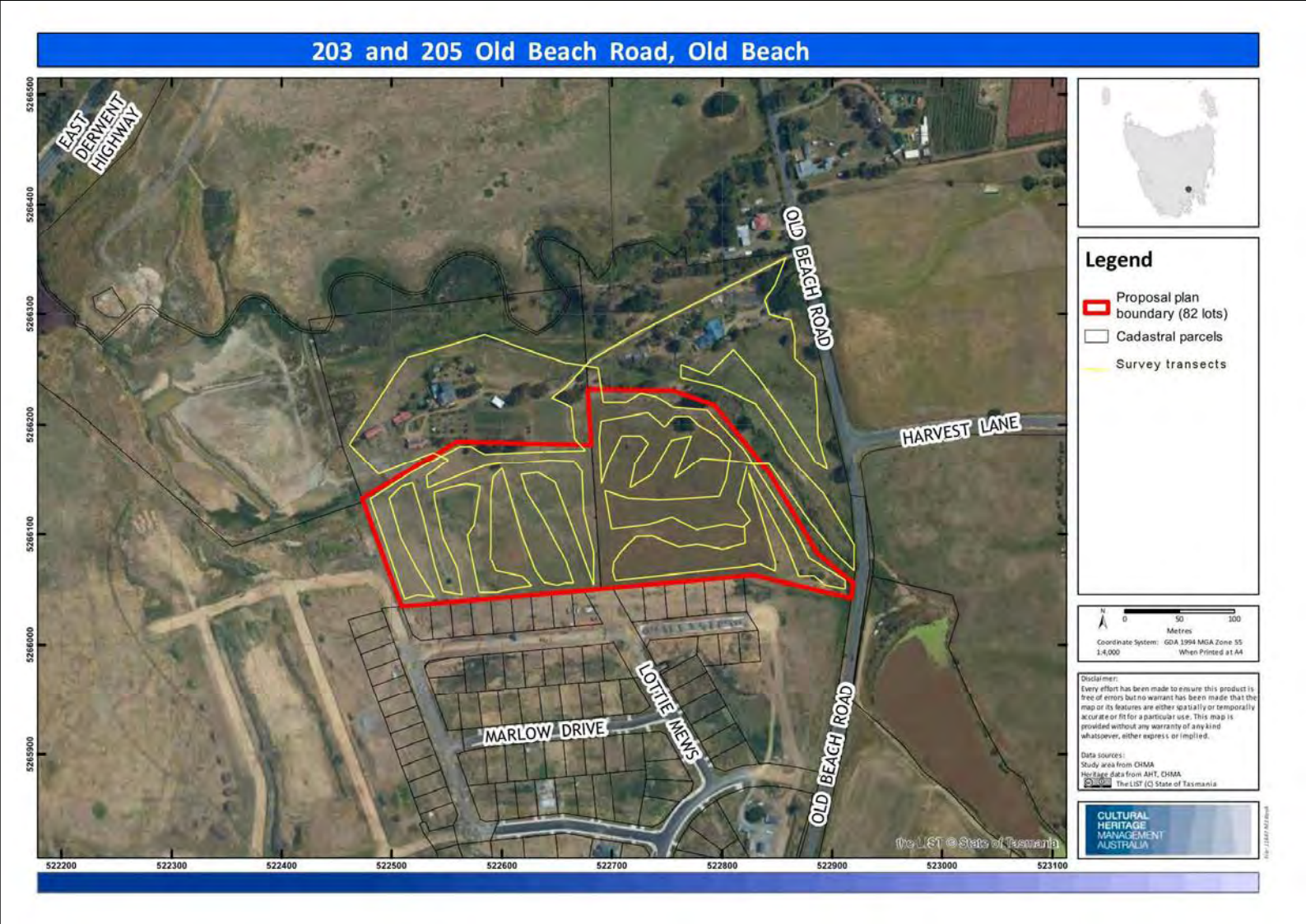


Figure 11: Survey transects walked within and in the surrounds of the boundaries of the study area

7.0 Survey Results and Discussion

No Aboriginal sites or suspected features were identified during the field survey assessment of the 203 and 205 Old Beach Road study area. The field survey was able to confirm that there are no stone resources within the study area that would be suitable for stone artefact manufacturing. There are also no potential rock shelter features present in the study area.

As noted in section 4.3 of this report, the search of the AHR undertaken for this project shows that there are no registered Aboriginal sites that are located within the actual study area boundaries. The closest registered site to the study area is AH12011, which is classified as an Isolated artefact. The grid reference location provided on the AHR places this site around 8m to the south of the southern boundary of the study area. This matches with the site description provided for the site, which means the grid reference is likely to be accurate. Because this site is located on another private property, outside the study area, the field team could not attempt to relocate the artefact. The team did inspect the southern boundary of the study area closest to the site, but could find no evidence of artefacts extending into this area. Surface visibility along the southern boundary was restricted to around 20%. Based on the available information, it is confirmed that site AH12011 is situated outside the bounds of the study area and is not under any threat of impact from the proposed residential development.

There are another three registered sites that are situated within a 200m of the study area (sites AH8748, AH12008 and AH12009). All of these sites are located over 100m from the study area boundaries and are also not under any threat of impact from the proposed residential development.

As described in section 6 of the report, surface visibility across the study area was variable. Within the western portion of the study area visibility was comparatively good, averaging 50%. Across the east portion of the study area visibility was reduced to an average of just 10% due to thick grass cover. Given these constraints, it can't be stated with absolute certainty that there are no undetected Aboriginal heritage sites present in the study area. With this acknowledged, the survey assessment still did achieve effective coverage of 3325m² within the study area itself. This level of effective coverage is deemed to be sufficient for the purposes of generating a reasonable impression as to the extent, nature and distribution of Aboriginal heritage sites across the study area. Although there were significant variations in effective coverage between the west and east parts of the study area, the landscape setting is generally consistent across the entire study area, so that the findings for the west area can be used as a baseline for extrapolating the likely presence or absence of sites across the east portion of the study area.

The negative survey results can therefore be taken as a reasonably accurate indication that either there are no Aboriginal sites located in the study area, or site and artefact densities across the study area are likely very low, reflecting sporadic

activity. The most likely site type to be present would be small artefact scatters or isolated artefacts.

As noted in section 2 of this report, the native vegetation across the entire study area has been cleared as part of past farming practices. Any sites located within cleared agricultural areas will necessarily have been adversely impacted by agricultural and development activities, unavoidably compromising the integrity of any cultural sites retained within these areas. As such, there is very little potential for in situ sites to occur within the study area.

The negative findings of the survey assessment, and the interpretation of these findings, are generally consistent with the broader patterning of site distribution observed for the general surrounds of the study area (see Entura (2014), and the broader South East Region (see Officer 1980 and Brown 1986). The regional findings show that site and artefact densities across the South East Region are elevated in areas close to major resource zones, such as major river valleys, along coastal and estuarine margins. Away from these major resource zones, site densities tend to decrease significantly. The study area is situated in gently undulating terrain, over 1km away from the River Derwent, and the lower stretches of the Jordan River. These are two major water courses in this part of the South East Region, and are the biggest resource zones. Aboriginal activity is most likely to have been concentrated along these two river valleys, and this is supported by the archaeological record which shows high densities of sites within both river valleys. Away from these two rivers, site densities tend to much lower.

On the basis of the negative survey findings, the absence of registered Aboriginal sites, and the low potential for undetected Aboriginal sites to be present, the study area is assessed as being of low archaeological sensitivity.

8.0 Consultation with Aboriginal Communities and Statement of Aboriginal Significance

The designated Aboriginal Heritage Officer (AHO) for this project is Rocky Sainty. One of the primary roles of the Aboriginal Heritage Officer is to consult with Aboriginal community groups. The main purpose of this consultation process is:

- to advise Aboriginal community groups of the details of the project,
- to convey the findings of the Aboriginal heritage assessment,
- to document the Aboriginal social values attributed to Aboriginal heritage resources in the study area,
- to discuss potential management strategies for Aboriginal heritage sites, and
- to document the views and concerns expressed by the Aboriginal community representatives.

No Aboriginal sites were identified during the field survey of the study area at 203 and 205 Old Beach Road. A search of the AHR shows that there are no registered Aboriginal sites that are located within the study area boundaries. On the basis of the above, it is clear that the proposed subdivision will not impact on any known Aboriginal heritage sites and it is assessed that there is a low potential for undetected Aboriginal sites to be present. For this reason the decision has been made to send the report out to a select range of Aboriginal community groups in the Southern Region of Tasmania for information purposes. The report has also been provided to AHT for review.

Rocky Sainty has provided a statement of the Aboriginal cultural values attributed to the study area as a whole. This statement is presented below.

Statement of Cultural/Social Significance by Rocky Sainty

Aboriginal heritage provides a direct link to the past, however is not limited to the physical evidence of the past. It includes both tangible and intangible aspects of culture. Physical and spiritual connection to land and all things within the landscape has been, and continues to be, an important feature of cultural expression for Aboriginal people since creation. Physical evidence of past occupation of a specific place may include artefacts, living places (middens), rock shelters, markings in rock or on the walls of caves and/or rock shelters, burials and ceremonial places. Non-physical aspects of culture may include the knowledge (i.e. stories, song, dance, weather patterns, animal, plant and marine resources for food, medicines and technology) connected to the people and the place.

*While so much of the cultural landscape that was **Iutruwita** (Tasmania) before invasion and subsequent colonization either no longer exists, or has been heavily impacted on, these values continue to be important to the Tasmanian Aboriginal community, and are relevant to the region of the project proposal.*

We did not identify any Aboriginal heritage sites during the survey of the study area at Old Beach Road, and our AHR search shows that there are no registered sites located within the study area. Although surface visibility across some parts of our

surveyed areas was poor it is still my impression that there is a low potential for Aboriginal sites to be present in the study area, and I am satisfied that the proposed subdivision is unlikely to have any impacts on Aboriginal heritage values.

Even if the site of the project proposal contains no evidence of Aboriginal heritage there is always the cultural resources (flora, fauna, aquaculture or any other resource values that the earth may offer) and the living landscape, which highlight the high significance to the Aboriginal cultural heritage values to the country. The vast majority of the study area incorporates land that has been subject to high levels of landscape modification from land clearing, farming and development. Through this, much of the traditional resources of the area are now gone.

9.0 Statutory Controls and Legislative Requirements

The following provides an overview of the relevant State and Federal legislation that applies for Aboriginal heritage within the state of Tasmania.

9.1 State Legislation

In Tasmania, the *Aboriginal Heritage Act 1975* (the Act) is the primary Act for the treatment of Aboriginal cultural heritage. The Act is administered by the Minister for Aboriginal Affairs, through Aboriginal Heritage Tasmania (AHT) in the Department of Premier and Cabinet (DPAC). AHT is the regulating body for Aboriginal heritage in Tasmania and '[n]o fees apply for any application to AHT for advice, guidance, lodgement or permit application'.

The Act applies to 'relics' which are any object, place and/or site that is of significance to the Aboriginal people of Tasmania (as defined in section 2(3) of the Act). The Act defines what legally constitutes unacceptable impacts on relics and a process to approve impacts when there is no better option. Aboriginal relics are protected under the Act and it is illegal to destroy, damage, deface, conceal or otherwise interfere with a relic, unless in accordance with the terms of a permit granted by the Minister. It is illegal to sell or offer for sale a relic, or to cause or permit a relic to be taken out of Tasmania without a permit (section 2(4) qualifies and excludes 'objects made, or likely to have been made, for purposes of sale').

Section 10 of the Act sets out the duties and obligations for persons owning or finding an Aboriginal relic. Under section 10(3) of the Act, a person shall, as soon as practicable after finding a relic, inform the Director or an authorised officer of the find.

It should be noted that with regard to the discovery of suspected human skeletal remains, the *Coroners Act 1995* takes precedence. The *Coroners Act 1995* comes into effect initially upon the discovery of human remains, however once determined to be Aboriginal the *Aboriginal Relics Act* overrides the *Coroners Act*.

In August 2017, the Act was substantively amended and the title changed from the *Aboriginal Relics Act 1975*. As a result, the AHT *Guidelines to the Aboriginal Heritage Assessment Process* were replaced by the *Aboriginal Heritage Standards and Procedures*. The Standards and Procedures are named in the statutory *Guidelines* of the Act issued by the Minister under section 21A of the Act. Other amendments include:

- An obligation to fully review the Act within three years.
- Increases in maximum penalties for unlawful interference or damage to an Aboriginal relic. For example, maximum penalties (for deliberate acts) are 10,000 penalty units (currently \$1.57 million) for bodies corporate other than small business entities and 5,000 penalty units (currently \$785,000) for individuals or small business entities; for reckless or negligent offences, the maximum penalties are 2,000 and 1,000 penalty units respectively (currently \$314,000 and \$157,000). Lesser offences are also defined in sections 10, 12, 17 and 18.

- Prosecution timeframes have been extended from six months to two years.
- The establishment of a statutory Aboriginal Heritage Council to advise the Minister.

Section 21(1) specifies the relevant defence as follows: “It is a defence to a prosecution for an offence under section 9 or 14 if, in relation to the section of the Act which the defendant is alleged to have contravened, it is proved ... that, in so far as is practicable ... the defendant complied with the guidelines”.

9.2 Commonwealth Legislation

There are also a number of Federal Legislative Acts that pertain to cultural heritage. The main Acts being; *The Australian Heritage Council Act 2003*, *The Aboriginal and Torres Strait Islander Heritage Protection Act 1987* and the *Environment Protection and Biodiversity Conservation Act 1999*

Australian Heritage Council Act 2003 (Comm)

The *Australian Heritage Council Act 2003* defines the heritage advisory boards and relevant lists, with the Act's Consequential and Transitional Provisions repealing the Australian Heritage Commission Act 1975. The Australian Heritage Council Act, like the Australian Heritage Commission Act, does not provide legislative protection regarding the conservation of heritage items in Australia, but has compiled a list of items recognised as possessing heritage significance to the Australian community.

The Aboriginal and Torres Strait Islander Heritage Protection Act 1987.

This Federal Act was passed to provide protection for the Aboriginal heritage, in circumstances where it could be demonstrated that such protection was not available at a state level. In certain instances, the Act overrides relevant state and territory provisions.

The major purpose of the Act is to preserve and protect from injury and desecration, areas and objects of significance to Aborigines and Islanders. The Act enables immediate and direct action for protection of threatened areas and objects by a declaration from the Commonwealth minister or authorised officers. The Act must be invoked by, or on behalf of an Aboriginal or Torres Strait Islander or organisation.

Any Aboriginal or Torres Strait Islander person or organization may apply to the Commonwealth Minister for a temporary or permanent 'Stop Order' for protection of threatened areas or objects of significant indigenous cultural heritage.

The Commonwealth Act 'overrides' State legislation if the Commonwealth Minister is of the opinion that the State legislation (or undertaken process) is insufficient to protect the threatened areas or objects. Thus, in the event that an application is made to the Commonwealth Minister for a Stop Order, the Commonwealth Minister will, as a matter of course, contact the relevant State Agency to ascertain what protection is being imposed by the State and/or what mitigation procedures have been proposed by the landuser/developer.

In addition to the threat of a 'Stop Order' being imposed, the Act also provides for the following:

- If the Federal Court, on application from the Commonwealth Minister, is satisfied that a person has engaged or is proposing to engage in conduct that breaches the 'Stop Order', it may grant an injunction preventing or stopping such a breach (s.26). Penalties for breach of a Court Order can be substantial and may include a term of imprisonment;
- If a person contravenes a declaration in relation to a significant Aboriginal area, penalties for an individual are a fine up to \$10,000.00 and/or 5 years gaol and for a Corporation a fine up to \$50,000.00 (s.22);
- If the contravention is in relation to a significant Aboriginal object, the penalties are \$5,000.00 and/or 2 years gaol and \$25,000.00 respectively (s.22);
- In addition, offences under s.22 are considered 'indictable' offences that also attract an individual fine of \$2,000 and/or 12 months gaol or, for a Corporation, a fine of \$10,000.00 (s.23). Section 23 also includes attempts, inciting, urging and/or being an accessory after the fact within the definition of 'indictable' offences in this regard.

The Commonwealth Act is presently under review by Parliament and it is generally accepted that any new Commonwealth Act will be even more restrictive than the current legislation.

Environment Protection and Biodiversity Conservation Act 1999 (Comm)

This Act was amended, through the Environment and Heritage Legislation Amendment Act (No1) 2003 to provide protection for cultural heritage sites, in addition to the existing aim of protecting environmental areas and sites of national significance. The Act also promotes the ecologically sustainable use of natural resources, biodiversity and the incorporation of community consultation and knowledge.

The 2003 amendments to the *Environment Protection and Biodiversity Conservation Act 1999* have resulted in the inclusion of indigenous and non-Indigenous heritage sites and areas. These heritage items are defined as:

'indigenous heritage value of a place means a heritage value of the place that is of significance to indigenous persons in accordance with their practices, observances, customs, traditions, beliefs or history;

Items identified under this legislation are given the same penalty as actions taken against environmentally sensitive sites. Specific to cultural heritage sites are §324A-324ZB.

Environment and Heritage Legislation Amendment Act (No1) 2003 (Comm)

In addition to the above amendments to the *Environment Protection and Biodiversity Conservation Act 1999* to include provisions for the protection and conservation of heritage, the Act also enables the identification and subsequent listing of items for the Commonwealth and National Heritage Lists. The Act establishes the *National Heritage List*, which enables the inclusion of all heritage, natural, Indigenous and

non-Indigenous, and the *Commonwealth Heritage List*, which enables listing of sites nationally and internationally that are significant and governed by Australia.

In addition to the *Aboriginal and Torres Strait Islander Heritage Protection Act 1987*, amendments made to the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)* enables the identification and subsequent listing of indigenous heritage values on the Commonwealth and/or National Heritage Lists (ss. 341D & 324D respectively). Substantial penalties (and, in some instances, gaol sentences) can be imposed on any person who damages items on the National or Commonwealth Heritage Lists (ss. 495 & 497) or provides false or misleading information in relation to certain matters under the Act (ss.488-490). In addition, the wrongdoer may be required to make good any loss or damage suffered due to their actions or omissions (s.500).

10.0 Aboriginal Cultural Heritage Management Plan

Heritage management options and recommendations provided in this report are made on the basis of the following criteria.

- Consultation with AHO Rocky Saintry.
- Background research into the extant archaeological and ethno-historic record for the study area and the surrounding region (see sections 3 and 4).
- The results of the investigation as documented in this report (see section 7); and
- The legal and procedural requirements as specified in the *Aboriginal Heritage Act 1975* (see section 9).

Recommendation 1

No Aboriginal sites or suspected features were identified during the field survey of the study area at 203 and 205 Old Beach Road. A search of the AHR shows that there are no registered Aboriginal sites that are located within the study area, and it is assessed that there is a low potential for undetected Aboriginal heritage sites to be present. It is therefore advised there are no Aboriginal heritage constraints, or legal impediments to the project proceeding.

Recommendation 2

If, during the course of the proposed development works, previously undetected archaeological sites or objects are located, the processes outlined in the Unanticipated Discovery Plan should be followed (see Appendix 1). A copy of the Unanticipated Discovery Plan (UDP) should be kept on site during all ground disturbance and construction work. All construction personnel should be made aware of the Unanticipated Discovery Plan and their obligations under the *Aboriginal Heritage Act 1975* (the Act).

Recommendation 3

Copies of this report should be submitted to Aboriginal Heritage Tasmania (AHT) for review and comment.

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Glossary of Terms

Aboriginal Archaeological Site

A site is defined as any evidence (archaeological features and/or artefacts) indicating past Aboriginal activity, and occurring within a context or place relating to that activity. The criteria for formally identifying a site in Australia vary between States and Territories.

Artefact

A portable object that has been humanly made or modified (see also stone artefact).

Assemblage (lithic)

A collection of complete and fragmentary stone artefacts and manuports obtained from an archaeological site, either by collecting artefacts scattered on the ground surface, or by controlled excavation.

Broken Flake

A flake with two or more breakages, but retaining its area of break initiation.

Chert

A highly siliceous rock type that is formed biogenically from the compaction and precipitation of the silica skeletons of diatoms. Normally there is a high percentage of cryptocrystalline quartz. Like chalcedony, chert was valued by Aboriginal people as a stone material for manufacturing stone tools. The rock type often breaks by conchoidal (shell like) fracture, providing flakes that have hard, durable edges.

Cobble

Water worn stones that have a diameter greater than 64mm (about the size of a tennis ball) and less than 256mm (size of a basketball).

Core

A piece of stone, often a pebble or cobble, but also quarried stone, from which flakes have been struck for the purpose of making stone tools.

Core Fragments

A piece of core, without obvious evidence of being a chunky primary flake.

Cortex

The surface of a piece of stone that has been weathered by chemical and/or physical means.

Debitage

The commonly used term referring to the stone refuse discarded from knapping. The manufacturing of a single implement may result in the generation of a large number of pieces of debitage in an archaeological deposit.

Flake (general definition)

A piece of stone detached from a nucleus such as a core. A complete or substantially complete flake of lithic material usually shows evidence of hard indenter initiation, or occasional bending initiation. The most common type of flake is the 'conchoidal flake'. The flake's primary fracture surface (the ventral or inside surface) exhibits features such as fracture initiation, bulb of force, and undulations and lances that indicate the direction of the fracture front.

Flake fragment

An artefact that does not have areas of fracture initiation, but which displays sufficient fracture surface attributes to allow identification as a stone artefact fragment.

Flake portion (broken flake)

The proximal portion of a flake retaining the area of flake initiation, or a distal portion of a flake that retains the flake termination point.

Flake scraper

A flake with retouch along at least one margin. The character of the retouch strongly suggests shaping or rejuvenation of a cutting edge.

Nodules

Regular or irregular cemented masses or nodules within the soil. Also referred to as concretions and buckshot gravel. Cementing agents may be iron and/or manganese oxides, calcium carbonate, gypsum etc. Normally formed in situ and commonly indicative of seasonal waterlogging or a fluctuating chemical environment in the soil such as; oxidation and reduction, or saturation and evaporation. Nodules can be redistributed by erosion. (See also 'concretion').

Pebble

By geological definition, a waterworn stone less than 64 mm in diameter (about the size of a tennis ball). Archaeologists often refer to waterworn stones larger than this as pebbles though technically they are cobbles.

Quartz

A mineral composed of crystalline silica. Quartz is a very stable mineral that does not alter chemically during weathering or metamorphism. Quartz is abundantly common and was used by Aboriginal people throughout Australia to make light-duty cutting tools. Despite the often unpredictable nature of fracture in quartz, the flakes often have sharp cutting edges.

Quartzite

A hard silica rich stone formed in sandstone that has been recrystallised by heat (metaquartzite) or strengthened by slow infilling of silica in the voids between the sand grains (Orthoquartzite).

Retouch (on stone tools)

An area of flake scars on an artefact resulting from intentional shaping, resharpening, or rejuvenation after breakage or blunting of a cutting edge. In resharpening a cutting edge the retouch is invariably found only on one side (see also 'indeterminate retouched piece', retouch flake' etc).

Scraper

A general group of stone artefacts, usually flakes but also cores, with one or more retouched edges thought to have been used in a range of different cutting and scraping activities. A flake scraper is a flake with retouch along at least one margin, but not qualifying for attribution to a more specific implement category. Flake scrapers sometimes also exhibit use-wear on the retouched or another edge.

Silcrete

A hard, fine grained siliceous stone with flaking properties similar to quartzite and chert. It is formed by the cementing and/or replacement of bedrock, weathering deposits, unconsolidated sediments, soil or other material, by a low temperature physico-chemical process. Silcrete is essentially composed of quartz grains cemented by microcrystalline silica. The clasts in silcrete are most often quartz grains but may be chert or chalcedony or some other hard mineral particle. The mechanical properties and texture of silcrete are equivalent to the range exhibited by chert at the fine-grained end of the scale and with quartzite at the coarse-grained end of the scale. Silcrete was used by Aboriginal people throughout Australia for making stone tools.

Site Integrity

The degree to which post-depositional disturbance of cultural material has occurred at a site.

Stone Artefact

A piece (or fragment) of stone showing evidence of intentional human modification.

Stone procurement site

A place where stone materials is obtained by Aboriginal people for the purpose of manufacturing stone artefacts. In Australia, stone procurement sites range on a continuum from pebble beds in water courses (where there may be little or no evidence of human activity) to extensively quarried stone outcrops, with evidence of pits and concentrations of hammerstones and a thick layer of knapping debris.

Stone tool

A piece of flaked or ground stone used in an activity, or fashioned for use as a tool. A synonym of stone tool is 'implement'. This term is often used by archaeologists to describe a flake tool fashioned by delicate flaking (retouch).

Use wear

Macroscopic and microscopic damage to the surfaces of stone tools, resulting from its use. Major use-wear forms are edge fractures, use-polish and smoothing, abrasion, and edge rounding bevelling.

Appendix 1

Unanticipated Discovery Plan

Unanticipated Discovery Plan

Procedure for the management of unanticipated discoveries of Aboriginal relics in Tasmania

For the management of unanticipated discoveries of Aboriginal relics in accordance with the *Aboriginal Heritage Act 1975* and the *Coroners Act 1995*. The Unanticipated Discovery Plan is in two sections.

Discovery of Aboriginal Relics other than Skeletal Material

Step 1:

Any person who believes they have uncovered Aboriginal relics should notify all employees or contractors working in the immediate area that all earth disturbance works must cease immediately.

Step 2:

A temporary 'no-go' or buffer zone of at least 10m x 10m should be implemented to protect the suspected Aboriginal relics, where practicable. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected Aboriginal relics have been assessed by a consulting archaeologist, Aboriginal Heritage Officer or Aboriginal Heritage Tasmania staff member.

Step 3:

Contact Aboriginal Heritage Tasmania on **1300 487 045** as soon as possible and inform them of the discovery. Documentation of the find should be emailed to **aboriginal@dpac.tas.gov.au** as soon as possible. Aboriginal Heritage Tasmania will then provide further advice in accordance with the *Aboriginal Heritage Act 1975*.

Discovery of Skeletal Material

Step 1:

Call the Police immediately. Under no circumstances should the suspected skeletal material be touched or disturbed. The area should be managed as a crime scene. It is a criminal offence to interfere with a crime scene.

Step 2:

Any person who believes they have uncovered skeletal material should notify all employees or contractors working in the immediate area that all earth disturbance works cease immediately.

Step 3:

A temporary 'no-go' or buffer zone of at least 50m x 50m should be implemented to protect the suspected skeletal material, where practicable. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected skeletal remains have been assessed by the Police and/or Coroner.

Step 4:

If it is suspected that the skeletal material is Aboriginal, Aboriginal Heritage Tasmania should be notified.

Step 5:

Should the skeletal material be determined to be Aboriginal, the Coroner will contact the Aboriginal organisation approved by the Attorney-General, as per the *Coroners Act 1995*.

Guide to Aboriginal site types

Stone Artefact Scatters

A stone artefact is any stone or rock fractured or modified by Aboriginal people to produce cutting, scraping or grinding implements. Stone artefacts are indicative of past Aboriginal living spaces, trade and movement throughout Tasmania. Aboriginal people used hornfels, chalcedony, spongelite, quartzite, chert and silcrete depending on stone quality and availability. Stone artefacts are typically recorded as being 'isolated' (single stone artefact) or as an 'artefact scatter' (multiple stone artefacts).

Shell Middens

Middens are distinct concentrations of discarded shell that have accumulated as a result of past Aboriginal camping and food processing activities. These sites are usually found near waterways and coastal areas, and range in size from large mounds to small scatters. Tasmanian Aboriginal middens commonly contain fragments of mature edible shellfish such as abalone, oyster, mussel, warrener and limpet, however they can also contain stone tools, animal bone and charcoal.

Rockshelters

An occupied rockshelter is a cave or overhang that contains evidence of past Aboriginal use and occupation, such as stone tools, middens and hearths, and in some cases, rock markings. Rockshelters are usually found in geological formations that are naturally prone to weathering, such as limestone, dolerite and sandstone

Quarries

An Aboriginal quarry is a place where stone or ochre has been extracted from a natural source by Aboriginal people. Quarries can be recognised by evidence of human manipulation such as battering of an outcrop, stone fracturing debris or ochre pits left behind from processing the raw material. Stone and ochre quarries can vary in terms of size, quality and the frequency of use.

Rock Marking

Rock marking is the term used in Tasmania to define markings on rocks which are the result of Aboriginal practices. Rock markings come in two forms; engraving and painting. Engravings are made by removing the surface of a rock through pecking, abrading or grinding, whilst paintings are made by adding pigment or ochre to the surface of a rock.

Burials

Aboriginal burial sites are highly sensitive and may be found in a variety of places, including sand dunes, shell middens and rock shelters. Despite few records of pre-contact practices, cremation appears to have been more common than burial. Family members carried bones or ashes of recently deceased relatives. The Aboriginal community has fought long campaigns for the return of the remains of ancestral Aboriginal people.

Further information on Aboriginal Heritage is available from:

Aboriginal Heritage Tasmania
Community Partnerships and Priorities
Department of Premier and Cabinet
GPO Box 123 Hobart TAS 7001

Telephone: 1300 487 045
Email: aboriginal@dpac.tas.gov.au
Web: www.aboriginalheritage.tas.gov.au

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AHR Instrument: AHA567
Applicant: Adele Fenwick (JMG Engineers)
Date: 07/07/2023

RECORD OF ADVICE FROM ABORIGINAL HERITAGE TASMANIA ON AN ABORIGINAL HERITAGE ASSESSMENT REPORT

This document provides a record of advice relating to an assessment undertaken in accordance with the [Aboriginal Heritage Standards and Procedures](#), as adopted by the [Guidelines](#) issued under section 21A of the *Aboriginal Heritage Act 1975*.

Report title: Residential Subdivision - 203 and 205 Old Beach Road, Old Beach - June 2023 - Stuart Huys and Rocky Sainty

Advice: AHT acknowledge the findings and recommendations of the assessment. For the purposes of the *Aboriginal Heritage Act 1975* the report conforms to the assessment standards outlined in the *Aboriginal Heritage Standards and Procedures*. All works should proceed in accordance with the recommendations made within the report.

All Aboriginal heritage is protected under the *Aboriginal Heritage Act 1975*. It is an offence to destroy, damage, deface, conceal, or otherwise interfere with a relic (Aboriginal heritage) without a permit granted by the Minister. If at any time Aboriginal heritage is suspected, the process outlined in the [Unanticipated Discovery Plan](#) should be followed as there is an obligation to report findings of Aboriginal heritage as soon as practicable.

As explained in the *Guidelines*, obtaining this record of advice does not exempt a person from their obligations under the Act but is an important element of the actions summarised in the *Guidelines*. To be sure that you have “in so far as is practicable ... complied with the guidelines” (s.21(1) of the *Aboriginal Heritage Act 1975*), be sure to read the relevant part and take any other action that may be relevant to your situation.

This advice is valid for two years and only for the activity as described in the Aboriginal Heritage Assessment Report specified above.

Please contact Aboriginal Heritage Tasmania on 1300 487 045 or aboriginalheritage@dpac.tas.gov.au if you require further information.

Disclaimer *The advice contained within this document is based on information available to Aboriginal Heritage Tasmania at the time of its preparation and is provided in good faith. It does not constitute legal advice, is not intended to be a substitute for legal advice and should not be relied upon as such. Proponents should seek specialist legal advice, if required, regarding the Aboriginal Heritage Act 1975 when applying the information to their specific needs.*



JMG

**203 & 205 Old Beach Road
Traffic Impact Statement**

August 2023



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1. Introduction

1.1 Background

Midson Traffic were engaged by JMG to prepare a traffic impact statement for a proposed rezoning proposal for future residential subdivision at 203 & 205 Old Beach Road, Old Beach.

1.2 Traffic Impact Assessment/ Traffic Impact Statement

A traffic impact assessment (TIA) is a process of compiling and analysing information on the impacts that a specific development proposal is likely to have on the operation of roads and transport networks. A TIA should not only include general impacts relating to traffic management but should also consider specific impacts on all road users, including on-road public transport, pedestrians, cyclists and heavy vehicles.

A traffic impact statement (TIS) is a reduced form of a TIA, where only specific traffic and/or parking matters are required to be investigated. A TIS is often undertaken when the full traffic and transport impacts associated with a development are not considered necessary.

This TIS has generally been prepared in accordance with the Department of State Growth (DSG) publication, *A Framework for Undertaking Traffic Impact Assessments*, 2007. This TIS has also been prepared with reference to the Austroads publication, *Guide to Traffic Management*, Part 12: *Traffic Impacts of Developments*, 2019.

This TIS also addresses the relevant clauses of Code C3.0, *Road and Railway Assets Code*, of the Tasmanian Planning Scheme - Brighton, 2021.

1.3 Statement of Qualification and Experience

This TIA has been prepared by an experienced and qualified traffic engineer in accordance with the requirements of Council's Planning Scheme and The Department of State Growth's, *Traffic Impact Assessment Guidelines*, August 2020, as well as Council's requirements.

The TIA was prepared by Keith Midson. Keith's experience and qualifications are briefly outlined as follows:

- 27 years professional experience in traffic engineering and transport planning.
- Master of Transport, Monash University, 2006
- Master of Traffic, Monash University, 2004
- Bachelor of Civil Engineering, University of Tasmania, 1995
- Engineers Australia: Fellow (FIEAust); Chartered Professional Engineer (CPEng); Engineering Executive (EngExec); National Engineers Register (NER)

1.4 Project Scope

The project scope of this TIA is outlined as follows:

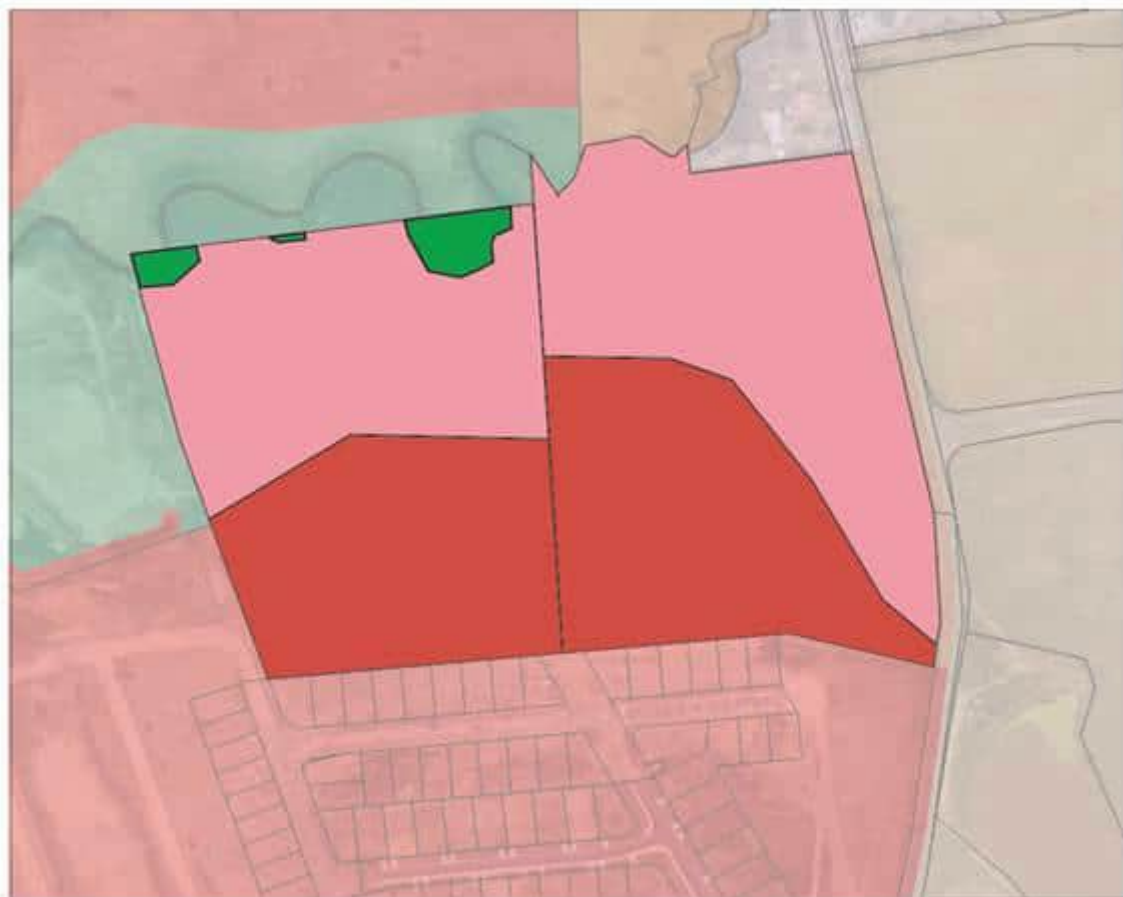
- Review of the existing road environment in the vicinity of the site and the traffic conditions on the road network.
- Provision of information on the proposed development with regards to traffic movements and activity.
- Identification of the traffic generation potential of the proposal with respect to the surrounding road network in terms of road network capacity.
- Review of the parking requirements of the proposed development. Assessment of this parking supply with Planning Scheme requirements.
- Traffic implications of the proposal with respect to the external road network in terms of traffic efficiency and road safety.

1.5 Subject Site & Study Area

The subject site is located at 203 & 205 Old Beach Road, Old Beach. The site is currently a vacant lot.

The study area includes all land potentially accessed by Riviera Drive, between East Derwent Highway and Old Beach Road. The subject site, study area and surrounding road network is shown in Figure 1.

Figure 2 Rezoning Plan



1.7 Reference Resources

The following references were used in the preparation of this TIA:

- Tasmanian Planning Scheme - Brighton, 2021 (Planning Scheme)
- Austroads, *Guide to Traffic Management*, Part 12: *Traffic Impacts of Developments*, 2019
- Austroads, *Guide to Road Design*, Part 4A: Unsignalised and Signalised Intersections, 2021
- Department of State Growth, *Traffic Impact Assessment Guidelines*, 2020
- Roads and Maritime Services NSW, *Guide to Traffic Generating Developments*, 2002 (RMS Guide)
- Roads and Maritime Services NSW, *Updated Traffic Surveys*, 2013 (Updated RMS Guide)
- Australian Standards, AS2890.1, *Off-Street Parking*, 2004 (AS2890.1)

2. Existing Conditions

2.1 Transport Network

For the purpose of this report, the transport network consists of East Derwent Highway, Old Beach Road, Lottie Way and Riviera Drive.

2.1.1 East Derwent Highway

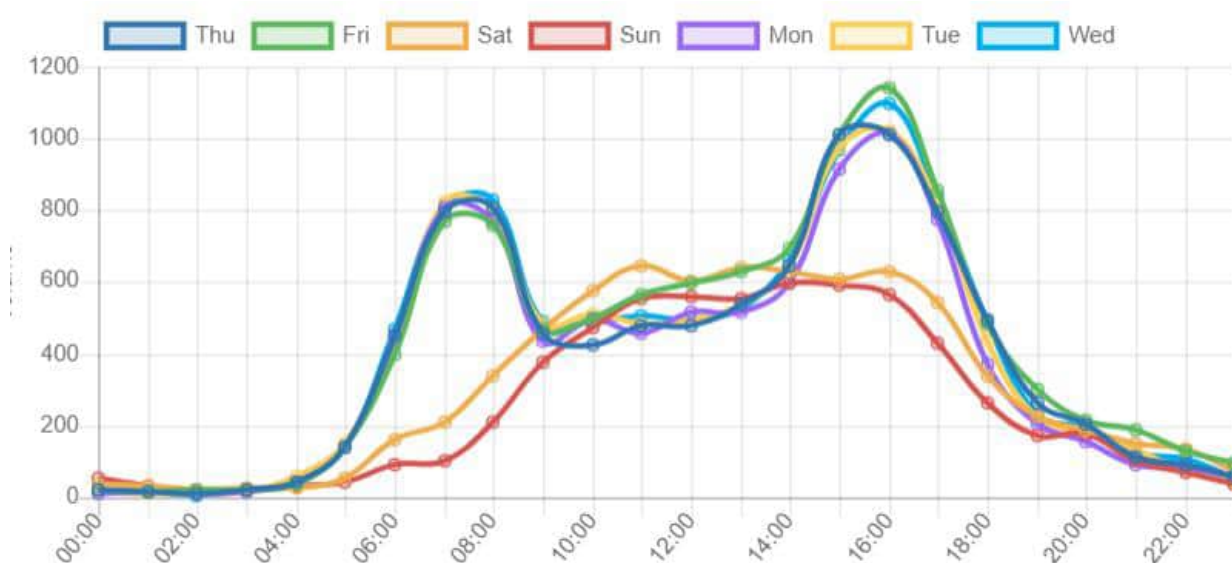
East Derwent Highway is a Category 3 'Regional Access Road' under State Growth's Tasmanian State Road Hierarchy. Regional Access Roads are of strategic importance to regional and local communities and economies. They link towns and regions to Category 1 and 2 roads and provide an important freight task role (although to a lesser extent to Category 1 and 2 roads). It carries approximately 11,500 vehicles per day (State Growth traffic data).

The posted speed limit of East Derwent Highway is 80-km/h. East Derwent Highway carries approximately 8,750 vehicles per day¹. Peak flows are 618 and 911 vehicles per hour for the AM and PM peak periods respectively. Peak directional flows are:

- AM Peak Northbound 280 vph; Southbound 522 vph
- PM Peak Northbound 645 vph; Southbound 390 vph

Peak hourly flow is shown in Figure 3. Peak hourly directional traffic flow of the East Derwent Highway is shown in Figure 4. The East Derwent Highway at the Riviera Drive junction is shown in Figure 5.

Figure 3 East Derwent Highway Hourly Traffic Flow



¹ Department of State Growth, 2022 traffic data, north of Old Beach Road junction.

Figure 4 East Derwent Highway Peak Directional Flow

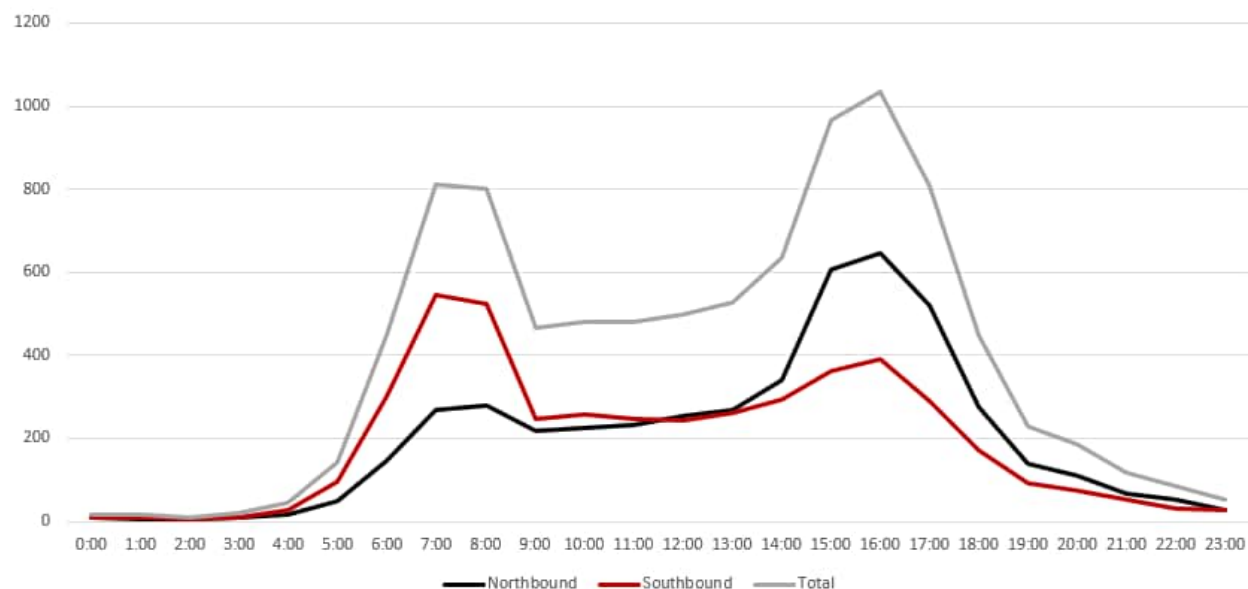


Figure 5 East Derwent Highway



2.1.2 Old Beach Road

Old Beach Road connects between East Derwent Highway at its southern end, and Briggs Road/ Gage Road at its northern end. Old Beach Road provides a rural collector road function that services a residential catchment east of East Derwent Highway.

Old Beach Road extends across the eastern boundary of the subject site, but does not provide direct vehicular connectivity to the site.

2.1.3 Lottie Mews

Lottie Mews is a local residential road that services the existing subdivision within the study area. It currently connects between Riviera Drive and Arbie Lane. The northern end of Lottie Mews connects to the subject site.

The sealed pavement width of Lottie Mews is 7.9 metres. The general urban speed limit of 50-km/h is applicable to Lottie Mews.

2.1.4 Riviera Drive

Riviera Drive is a residential collector road that connects between East Derwent Highway and Little Mews. The road reservation of Riviera Drive extends to Old Beach Road, however the road has not been constructed to provide connectivity.

The sealed pavement width of Riviera Drive is approximately 8 metres. The general urban speed limit of 50-km/h is applicable to Riviera Drive.

Riviera Drive connects to the East Derwent Highway at a T-junction with channelised right turn lane. The East Derwent Highway/ Riviera Drive junction is shown in Figure 5.

2.2 Road Safety Performance

Crash data can provide valuable information on the road safety performance of a road network. Existing road safety deficiencies can be highlighted through the examination of crash data, which can assist in determining whether traffic generation from the proposed development may exacerbate any identified issues.

Crash data was obtained from the Department of State Growth for a 5+ year period between 1st January 2018 and 31st July 2023 for Riviera Drive, Lottie Mews and Old Beach Road.

The findings of the crash data is summarised as follows:

- 1 crash was reported in Riviera Drive – the single vehicle crash was reported at 3:44pm, 24th May 2023 at the intersection of Rachel Crescent and Riviera Drive involving property damage only.
- No crashes were reported in Lottie Mews.
- 4 crashes were reported in Old Beach Road. These are detailed as follows:
 - 12:30am, 26th December 2020, 'other-straight' crash at a midblock location resulting in property damage only.
 - 11:15am, 29th January 2021, 'right-through' collision at the intersection of Mollineaux Drive and Old Beach Road resulting in property damage only.
 - 12:30pm, 14th March 2022, 'leaving-parking' crash at a midblock location resulting in property damage only.
 - 5:55am, 6th March 2023, 'other-straight' collision at the intersection of East Derwent Highway resulting in property damage only.

The crash rate does not provide any indication that there are pre-existing road safety deficiencies in the transport network near the subject site. It is noted that much of the study area is under construction, and the full traffic generation associated with approved subdivisions has not yet been realised.

Importantly no crashes have been reported at the East Derwent Highway/ Riviera Drive junction.

3. Traffic Impacts

3.1 Traffic Generation Rates

Traffic generation rates were sourced from the RMS Guide. The RMS Guide states the following traffic generation rates for residential dwellings:

- Daily vehicle trips 7.4 trips per dwelling per day
- Weekday peak hour vehicle trips 0.78 trips per dwelling per hour

3.2 Subject Site Traffic Generation

The following assumptions have been applied to the proposed rezoned land in order to determine the likely number of lots that may be applicable to the rezoned lane:

- Assuming an average lot size of 500 m² (consistent with typical lot sizes in adjacent subdivision within the subject site, generally ranging from 500m² to 1,500m² and assuming a 'worst-case' scenario of only small lot sizes).
- Road infrastructure will utilise approximately 20% of the site area. This is consistent with adjacent subdivision areas (typically with road infrastructure utilising 20-30% of available land).
- The total area of the site is 6.4 hectares, however some of this land is constrained due to the creek and required setbacks. The subdividable area of the subject site is approximately 6.2 hectares. This equates to a maximum lot yield of 101 lots.

Based on the trip generation rates in Section 3.1, the traffic generation from future subdivision of the rezoned land within the subject site is 747 vehicles per day, with a peak of 79 vehicles per hour.

3.3 Subject Site and Existing Subdivision Traffic Generation

It is important to consider the potential traffic generation associated with the subject site in addition to the approved subdivision in the study area (including constructed and approved subdivision). This excludes vacant land within the subject site that has not yet been considered for subdivision.

The traffic generation associated with the existing subdivision area in addition to the potential subdivision associated with the subject site includes:

- 90 recently approved lots accessed via the eastern end of Riviera Drive (including subdivision within new roads such as Lottie Mews, Maritimo Way, Arbie Lane, etc).
- 130 established lots accessed via the full length of Riviera Drive (including Rachel Crescent, Lewis Court, Jye Court, Hannah Court, Amelia Court, etc).
- 101 potential lots associated with the subject site.

This equates to a total of 321 lots associated with this scenario. The traffic generation associated with this scenario is 2,375 vehicles per day with a peak of 250 vehicles per hour. This has been modelled as 'Scenario 1' to determine the potential impacts associated with future subdivision of the subject site.

3.4 Study Area Maximum Traffic Generation

The study area is in various stages of development, with established residential subdivision areas, areas of subdivision under construction, and vacant land.

The number of lots (actual and estimated) within the study area, including the subject site, is summarised as follows:

- 90 recently approved lots accessed via the eastern end of Riviera Drive (including new roads such as Lottie Mews, Maritimo Way, Arbie Lane, etc).
- 130 established lots accessed via the full length of Riviera Drive (including Rachel Crescent, Lewis Court, Jye Court, Hannah Court, Amelia Court, etc).
- 101 potential lots associated with the subject site.
- Approximately 150 potential lots associated with Lot 4 Lewis Court (using the same methodology as Section 3.2 and noting constraints associated with setbacks from the highway).

The total number of potential lots within the study area, excluding the subject site, is therefore 471 lots.

The traffic generation associated with the subject site is therefore 3,485 vehicles per day, with a peak of 367 vehicles per hour. This has been modelled as 'Scenario 2' to determine the potential impacts associated with future subdivision of the subject site.

3.5 Trip Assignment

The transport network utilises Riviera Drive as a minor collector road for the study area. All traffic generated by future subdivision of the subject site will utilise Riviera Drive to connect to the East Derwent Highway.

Two scenarios have been considered in the assessment of trip assignment:

- Scenario 1. All existing approved subdivision within the study area including the subject site's potential traffic generation associated with future subdivision. Peak hour traffic flow on the highway has been factored for 10-year growth, using a compound growth rate of 1.5% per annum.
- Scenario 2. All potential traffic generation within the study area, including existing approved subdivision, potential traffic generation associated with the subject site, and future subdivision of the remaining land in the study area. Peak hour traffic flow on the highway has been factored for 10-year growth, using a compound growth rate of 1.5% per annum.

The future turning movements associated with the East Derwent Highway/ Riviera Road junction are summarised in Table 1.

Table 1 East Derwent Highway/ Riviera Turning Movements

Scenario/ Peak	Left-In	Right-In	Left-Out	Right-Out	Northbound	Southbound
AM Scenario 1	49 vph	26 vph	114 vph	61 vph	325 vph	606 vph
PM Scenario 1	57 vph	93 vph	88 vph	12 vph	749 vph	453 vph
AM Scenario 2	72 vph	38 vph	167 vph	90 vph	325 vph	606 vph
PM Scenario 2	83 vph	137 vph	131 vph	15 vph	749 vph	453 vph

3.6 East Derwent Highway/ Riviera Drive Analysis

The subject site will connect to Riviera Drive via Lottie Mews. Riviera Drive provides the sole access to the external network, at its junction with the East Derwent Highway. The operational performance of the intersection of East Derwent Highway and Riviera Drive was therefore assessed using SIDRA Intersection traffic modelling software. SIDRA uses complex analytical traffic models coupled with iterative approximation technique to provide estimates of capacity and performance of intersections. SIDRA is endorsed as a modelling tool by Austroads.

3.6.1 SIDRA Modelling

One of the key SIDRA outputs is an indication of level of service (LOS) at intersections. The LOS concept describes the quality of traffic service in terms of 6 levels, with level of service A (LOS A) representing the best operating condition (ie. at or close to free flow) and level of service F (LOS F) representing the worst (i.e. forced flow). Other key outputs of SIDRA include average movement delay and 95th percentile queue lengths².

The level of service method used in the modelling is the Delay method, where level of service is based solely on average movement delay, including geometric delay, as summarised in Table 2.

² This is the queue length not exceeded 95% of the time.

Table 2 SIDRA LOS Performance standards

Level of Service	Signals and Roundabouts	Sign Control (Give Way & Stop)
A	$d \leq 10$	$d \leq 10$
B	$10 < d \leq 20$	$10 < d \leq 15$
C	$20 < d \leq 35$	$15 < d \leq 25$
D	$35 < d \leq 55$	$25 < d \leq 35$
E	$55 < d \leq 80$	$35 < d \leq 50$
F	$80 < d$	$50 < d$

The lowest target level of service considered acceptable for an urban environment is LOS D, which corresponds to a maximum delay of 35 seconds for give-way control. LOS E and F represent the junction operating at capacity, with forced flow conditions.

3.6.2 Junction Modelling Results

Scenarios 1 and 2 were modelled during the AM and PM peak periods. The SIDRA modelling indicates that the junction performs at a satisfactory LOS D for Scenario 1 during both peak periods.

For Scenario 2, the modelling indicates that the junction performance deteriorates to LOS E during the PM peak period for the Riviera Drive approach. This demonstrates that the junction cannot cater for full development of the study area as the only junction to the external road network.

The modelling indicates that the junction can accommodate approximately 450 lots before the junction deteriorates below LOS D in 10 years.

For full development to occur, the following options are considered appropriate:

- The conversion of the junction to a large diameter roundabout.
- The construction of a new T-Junction connecting to Old Beach Road. It is noted that a road reservation currently extends between the eastern termination of Riviera Drive and Old Beach Road. Careful road design could result in a road junction that would cater for traffic generated from the study area (broader than the subject site).

Table 3 AM Scenario 1 SIDRA Modelling Summary

Movement Performance - Vehicles								
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m
South: East Derwent Hwy								
2	T	342	10.5	0.187	0.0	LOS A	0.0	0.0
3	R	27	5.0	0.042	12.5	LOS B	0.2	1.1
Approach		369	10.1	0.187	0.9	NA	0.2	1.1
East: Riviera Drive								
4	L	120	5.0	0.230	14.1	LOS B	0.9	6.3
6	R	64	5.0	0.337	28.8	LOS D	1.1	8.4
Approach		184	5.0	0.337	19.2	LOS C	1.1	8.4
North: East Derwent Hwy								
7	L	52	5.0	0.029	8.4	LOS A	0.0	0.0
8	T	638	10.5	0.349	0.0	LOS A	0.0	0.0
Approach		689	10.1	0.349	0.6	NA	0.0	0.0
All Vehicles		1243	9.3	0.349	3.5	NA	1.1	8.4

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

Table 4 PM Scenario 1 SIDRA Modelling Summary

Movement Performance - Vehicles								
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m
South: East Derwent Hwy								
2	T	342	10.5	0.187	0.0	LOS A	0.0	0.0
3	R	40	5.0	0.063	12.8	LOS B	0.2	1.7
Approach		382	9.9	0.187	1.3	NA	0.2	1.7
East: Riviera Drive								
4	L	194	5.0	0.377	15.6	LOS C	1.7	12.7
6	R	72	5.0	0.391	30.9	LOS D	1.4	10.0
Approach		265	5.0	0.391	19.8	LOS C	1.7	12.7
North: East Derwent Hwy								
7	L	74	5.0	0.041	8.4	LOS A	0.0	0.0
8	T	638	10.5	0.349	0.0	LOS A	0.0	0.0
Approach		712	9.9	0.349	0.9	NA	0.0	0.0
All Vehicles		1359	9.0	0.391	4.7	NA	1.7	12.7

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

Table 5 AM Scenario 2 SIDRA Modelling Summary

Movement Performance - Vehicles								
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m
South: East Derwent Hwy								
2	T	342	10.5	0.187	0.0	LOS A	0.0	0.0
3	R	40	5.0	0.064	12.8	LOS B	0.2	1.7
Approach		382	9.9	0.187	1.3	NA	0.2	1.7
East: Riviera Drive								
4	L	176	5.0	0.343	15.3	LOS C	1.5	11.1
6	R	95	5.0	0.519	34.2	LOS D	2.0	14.5
Approach		271	5.0	0.519	21.9	LOS C	2.0	14.5
North: East Derwent Hwy								
7	L	76	5.0	0.042	8.4	LOS A	0.0	0.0
8	T	638	10.5	0.349	0.0	LOS A	0.0	0.0
Approach		714	9.9	0.349	0.9	NA	0.0	0.0
All Vehicles		1366	8.9	0.519	5.2	NA	2.0	14.5

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

Table 6 PM Scenario 2 SIDRA Modelling Summary

Movement Performance - Vehicles								
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m
South: East Derwent Hwy								
2	T	788	10.5	0.432	0.0	LOS A	0.0	0.0
3	R	144	5.0	0.187	11.8	LOS B	0.8	5.5
Approach		933	9.6	0.432	1.8	NA	0.8	5.5
East: Riviera Drive								
4	L	138	5.0	0.215	12.2	LOS B	0.8	5.9
6	R	16	5.0	0.146	37.8	LOS E	0.4	2.8
Approach		154	5.0	0.215	14.9	LOS B	0.8	5.9
North: East Derwent Hwy								
7	L	87	5.0	0.049	8.4	LOS A	0.0	0.0
8	T	477	10.5	0.261	0.0	LOS A	0.0	0.0
Approach		564	9.6	0.261	1.3	NA	0.0	0.0
All Vehicles		1651	9.2	0.432	2.9	NA	0.8	5.9

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

3.7 Local Road Capacity

The subject site will rely upon the existing road network to absorb the traffic generation associated with future subdivision. The subject site connects directly to Lottie Mews. The design of any future subdivision will need to include a road that connects to Lottie Mews and/or Arbie Lane.

The traffic volumes on Lottie Mews will be approximately 1,000 vehicles per day when considering approved development and future subdivision of the subject site (when fully developed). This traffic volume is well below the capacity of Lottie Mews as a minor collector road. The peak traffic flow will be

in the order of 100 to 120 vehicles per hour, which will result in a high level of service for a residential collector road.

Lottie Mews feeds into Riviera Drive. Riviera Drive is the main collector road that provides access to the study area from East Derwent Highway. Riviera Drive will carry approximately 2,375 vehicles per day when considering approved development and future subdivision of the subject site (when fully developed).

The traffic capacity of Riviera Drive is limited by the junction at East Derwent Highway, which has been demonstrated to have a capacity of 3,330 vehicles per day/ peak of 350 vehicles per hour with the existing junction configuration. The traffic generation associated with the proposed development can be absorbed by the existing junction layout and general construction of Riviera Drive.

4. Conclusions

This traffic impact statement (TIS) provides a high-level traffic assessment of proposed rezoning of land at 203 Old Beach Road, Old Beach.

The key findings of the TIA are summarised as follows:

- The rezoning of the land will result in a potential future subdivision of 101 residential lots.
- The traffic generation associated with future subdivision of the subject site is likely to be 750 vehicles per day with a peak of 80 vehicles per hour.
- When considering the approved subdivision within the study area, including the potential future subdivision of the subject site, the traffic volume of Riviera Drive near East Derwent Highway will be approximately 2,375 vehicles per day with a peak of 321 vehicles per hour. This volume is assuming that Riviera Drive provides the only access to the study area.
- Traffic modelling demonstrates that the existing junction of Riviera Drive and East Derwent Highway can accommodate the traffic volume within the study area, including the potential future subdivision of the subject site. The level of service of the junction results in an acceptable LOS D during peak periods.
- Future subdivision within the area is limited beyond the subject site. The intersection performance of East Derwent Highway/ Riviera Drive will deteriorate to an unacceptable LOS E at approximately 450 dwellings.
- The proposed rezoning can therefore be accommodated with the existing road network, however further development within the study area will be limited.
- There are several options to facilitate further development within the study area. These are summarised as follows:
 - Conversion of the East Derwent Highway/ Riviera Drive junction to a large diameter roundabout.
 - Extension of Riviera Drive to Old Beach Road. The existing road reservation appears to extend to Old Beach Road.

Based on the findings of this report the proposed rezoning is supported on traffic grounds.

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Document Status

Revision	Author	Review	Date
0	Keith Midson	Zara Kacic-Midson	17 August 2023