Balmoral Quay Stage 5 Residential Building, Harbourside Drive, Rippleside

Cultural Heritage Management Plan 18376

Report to Balmoral Quay Pty Ltd

Sponsor: Balmoral Quay Pty Ltd

[redacted]

[redacted]

Date of Completion: 2 May 2022

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Title: Balmoral Quay Stage 5 Residential Building, Harbourside Drive, Rippleside

CHMP Number: 18376

Activity Size: Small

Assessment Type: Complex

Registered Aboriginal Cultural Heritage Present in Activity Area: No

Sponsor: Balmoral Quay Pty Ltd (ABN 602 240 399)

Heritage Advisors: [redacted]

Authors: [redacted]

Date of Completion: 2 May 2022

DOCUMENT TRACKING

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ACKNOWLEDGEMENTS

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Template 2.8.1

Wadawurrung
Traditional Owners
Aboriginal Corporation

3.5.2022

Aboriginal Heritage Act 2006 Section 63

Cultural Heritage Management Plan – Notice of Approval

The Wadawurrung Traditional Owners Aboriginal Corporation acting as the Registered Aboriginal Party hereby approve the cultural heritage management plan referred to below:

Balmoral Quay Stage 5 Residential Building,
Harbourside Drive, Rippleside

Cultural Heritage Management Plan number: 18376

Sponsor: Balmoral Quay Pty Ltd

Heritage Advisor: [redacted]

Authors: [redacted]

Date: 2 May 2022

Pages: Cover Page, i-ix, 1-129

Received for Approval: 31st of March 2022

Pursuant to s.64 (1) of the Act this cultural heritage management plan takes effect upon the granting of this approval and once a copy is lodged with the Secretary of DPC. *

[redacted]
CEO
[redacted]

[redacted]
RAP Heritage Unit Manager
[redacted]

*This notice of approval should be inserted after the title page and bound with the body of the management plan.

ABN 11 312 302 330
ICN 3330

[redacted]

Executive Summary

Compliance requirements are set out in Part 1 of the Cultural Heritage Management Plan

Activity

The Sponsor intends to develop the activity area for the construction of a seven-story residential building, inclusive of a basement car park. The activity will also include the construction of retaining walls and driveways, as well as ancillary works including the construction of car parking, pedestrian pathways, landscaping and gardening, and the installation of seating and fencing.

Activity Area Location

The activity area comprises two land parcels covering a total area of 4,471 m² (0.4 ha) and is bounded by private property to the north, Harbourside Drive to the east, Liverpool Street to the south and Balmoral Crescent to the west, within the suburb of Rippleside. The activity area is situated approximately 2.6 km north north-west of the Geelong CBD, within the City of Greater Geelong local government area.

CHMP Sponsor

The CHMP Sponsor is Balmoral Quay Pty Ltd (ABN: 602 240 399).

CHMP Assessments

The CHMP activity area is located within a constructed coast landform (Geomorphological subunit 8.7 Engineered Coast – Port Melbourne) underlaid by Moorabool Viaduct Sands and the Fyansford Formation geological units within the Victorian Volcanic Plain bioregion. A **desktop assessment** did not identify any Aboriginal cultural heritage places within the activity area; 64 registered places, including artefact scatters and low-density artefact distributions, and occasional shell middens and Aboriginal historical places are located within the wider geographic region. Ethnographic observations indicate that the activity area is located within the traditional lands of the *Wadawurrung balug* clan.

A review of the land use history of the activity area indicated that the activity area is located on a landscape that has been utilised for maritime industry since 1905. More than 95% of the deposits originally comprising the activity area have been previously excavated to depths in excess of 10 m to construct a port complex and for land reclamation. Further impacts have included the installation of subsurface utilities and a pumping station.

A **standard assessment** ground survey established two investigation areas based on the presence of a single modified coastline landform and the varying levels of disturbance observed (the excavated lower ground level, and the embankments). No Aboriginal cultural heritage was identified during the ground survey. A **complex assessment** subsurface testing program involved the excavation of a single 2x1.2 m mechanical test pit, which presented a soil profile of a silty gravel fill to 250 mm in depth, overlying a firm-compact silty clay associated with the Fyansford Formation geological deposit (dating to 10-15 million years in age) to the base of at pit at 1.5 m. No Aboriginal cultural heritage was identified during the complex assessment.

Results

No registered Aboriginal cultural heritage places are located within the activity area.

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Abbreviations

Abbreviation	Description
ACHRIS	Aboriginal Cultural Heritage Register and Information System
APR	Archaeological Potential Rating
BP	Before Present (years)
CHMP	Cultural Heritage Management Plan
DELWP	Department of Environment, Land, Water and Planning, Victorian Government
DPC	Department of Premier and Cabinet
ELA	Eco Logical Australia
EVC	Ecological Vegetation Class
FP-SR	First Peoples – State Relations, Department of Premier and Cabinet, Victorian Government
HA	Heritage Advisor
IA	Investigation Area
km	kilometre
LDAD	Low-density artefact distribution
m	metres
m^2	square metres
mya	Million years ago
NOI	Notice of Intention to Prepare a CHMP
RAP	Registered Aboriginal Party
VAHC	Victorian Aboriginal Heritage Council
Vic	Victoria
WTOAC	Wadawurrung Traditional Owners Aboriginal Corporation
ya	Years ago

PART 1

CULTURAL HERITAGE MANAGEMENT CONDITIONS

These conditions become compliance requirements once the Cultural Heritage Management Plan (CHMP) is approved. Failure to comply with a condition is an offence under section 67A of the *Aboriginal Heritage Act 2006* (Vic) (the Act).

If the Sponsor fails to comply with the conditions of the CHMP, the Minister responsible for the Act may order a Cultural Heritage Audit under section 81 of the Act, acting on advice from the Secretary, Department of Premier and Cabinet (DPC), the Victorian Aboriginal Heritage Council (VAHC) or an authorised officer. Should a Cultural Heritage Audit be ordered, a Stop Order requiring the activity to cease immediately must also be issued to the Sponsor under section 88 of the Act.

A person is guilty of an indictable offence under section 27 of the Act and will be liable for significant financial penalties if:

- the person by an act or omission harms Aboriginal cultural heritage; and
- at the time of the act or omission the person:
    - knew that the act or omission was likely to harm Aboriginal cultural heritage; or
    - was reckless or negligent as to whether the act or omission was likely to harm Aboriginal cultural heritage.

Furthermore, an authorised officer or an Aboriginal heritage officer may issue a 24-hour Stop Order to a person under section 95A(1) of the Act if:

- the person is carrying out or proposes to carry out an act that is harming or likely to harm Aboriginal cultural heritage; and
- the authorised officer or Aboriginal heritage officer believes the only way to protect the heritage is to issue a 24-hour stop order.

However, harm is permitted under section 29(a)(i) of the Act if the person is acting in accordance with an approved CHMP. In addition, under section 95A(2) of the Act, an authorised officer or an Aboriginal heritage officer must not issue a 24-hour Stop Order to a person in relation to an act that is being carried out or is proposed to be carried out in accordance with an approved CHMP.

NOTE: The CHMP must be readily accessible to the Sponsor and their employees and contractors when carrying out the activity.

1. Cultural Heritage Management Conditions

1.1. General Conditions

These management conditions must be followed to appropriately manage any Wadawurrung cultural heritage within the activity area. The Sponsor is responsible for undertaking all management conditions and contingencies herein, including payment to undertake these items. This responsibility may be delegated in writing to the Sponsor's agent where required.

The Sponsor or delegated representative is responsible for ensuring that the activity adheres to the activity description as detailed in Section 4 of the CHMP. Any change to the activity area, the activity description or the approved management conditions will require either an amendment to the CHMP or the preparation of a new CHMP.

All references to the WTOAC relate to the Wadawurrung Traditional Owners Aboriginal Corporation, or any future name of that organisation.

1.1.1. Condition 1: Notification of Commencement of the Activity

The Sponsor must provide Wadawurrung with at least two weeks' notification before the commencement of works. This notification should be provided via email to rap@wadawurrung.org.au.

1.1.2. Condition 2: Copy of the Cultural Heritage Management Plan to be Retained Onsite

A hard copy of (at least) the following parts of this approved Cultural Heritage Management Plan (CHMP) must be held onsite at all times during works for the activity.

PART 1 – Cultural Heritage Management Conditions

- Specific management conditions
- Contingency plans

PART 2 – Assessment

- Introduction
- Activity description
- Extent of activity area covered by the Management Plan.

This information must be readily accessible to those undertaking works detailed within this document and must be able to be provided upon request. The Sponsor, site supervisor and all relevant personnel must read the information and be aware of the legal management conditions and contingency plans concerning Aboriginal cultural heritage within the activity area. The Sponsor or delegated person is responsible for ensuring that all personnel onsite are aware of the management conditions and contingency plans, and of the onsite location of the hard copy of the information from the approved CHMP.

1.1.3. Condition 3: Cultural Heritage Induction

A Cultural Heritage Induction must be conducted with all site workers/contractors undertaking ground disturbing works by a Heritage Advisor and WTOAC prior to those site workers/contractors undertaking any ground disturbance works. The cultural heritage induction must be conducted by a representative

of the WTOAC with the assistance of a Heritage Advisor. The Heritage Advisor will be responsible for developing and providing an Induction Booklet summarising the details to be presented as part of the Cultural Heritage Induction. Should additional staff be required to undertake ground disturbance works under this CHMP additional Cultural Heritage Induction(s) will be required to be completed prior to their participation in ground disturbance works.

The Cultural Heritage Induction must be booked at least 2 weeks prior to the commencement of any ground disturbance works. The best contact email for booking the Cultural Heritage Induction can be requested from rap@wadawurrung.org.au. A booking form will need to be submitted to confirm the Cultural Heritage Induction.

The purpose of the cultural heritage induction is to:

- describe and demonstrate the Aboriginal cultural heritage relevant to the activity area or the locality for personnel engaged in the construction of activity works
- create an awareness of Aboriginal cultural values, and
- inform personnel about the specific conditions of Part 1 of the management plan and the procedures set out for reporting any suspected Aboriginal cultural heritage that may be discovered or uncovered.

The cultural heritage induction will include information concerning:

- a brief history of the Aboriginal occupation of the activity area and broader region
- a summary of the assessments undertaken within the activity area during the preparation of the management plan
- specific details of all Aboriginal cultural heritage identified during the management plan assessments
- a summary of the management conditions and contingency plans contained within the management plan, and
- a discussion of the compliance responsibilities of the Sponsor and all personnel involved in work within the activity area and the requirements of the Aboriginal Heritage Act 2006.

The Sponsor or site contractor must indicate during the induction both the commencement date of the activity and the likely completion date of the activity.

Information detailing the CHMP management conditions and contingency plans must be incorporated into any job safety, tool-box meetings or Environmental Management Plans developed for the activity.

This Cultural Heritage Induction must be organised by the Sponsor.

1.1.4. Condition 4: Heritage Inspection

A Heritage Inspection will be undertaken by Wadawurrung representatives to monitor the progress of the activity and observe whether management conditions and the contingency plan contained within this CHMP are being followed. A total of one heritage inspection is to be undertaken during the course of the activity. The heritage inspection must occur at the following time:

- During the course of stripping the top 1.2 m of topsoil from the northern embankment within the activity area. The removal of the top 1.2 m of topsoil may also be monitored during this

single heritage inspection subject to the Occupational Health and Safety constraints of the work site.

If Aboriginal cultural material is located during any Heritage Inspection, the relevant contingency measures detailed in S2 below must be enacted.

WTOAC must be notified two weeks in advance of the required inspections.

A Wadawurrung representative will conduct the inspection and complete the compliance checklist under Contingency 10 of this CHMP. If the inspection reveals suspected non-compliance of the CHMP, then the procedure outlined in Contingency 10 will be initiated by the Sponsor. This procedure must be organised by the Sponsor.

1.1.5. Condition 4: Protocol for Handling Sensitive Information

With the exception of publicly available information, there shall be no communication or public release of information concerning Aboriginal cultural heritage without the written permission of the WTOAC. No photographs or information concerning Aboriginal cultural heritage is to be circulated to the media or via social media without the written permission of the WTOAC.

1.1.6. Condition 5: Notification of Completion of Activity

Wadawurrung must be notified at the completion of all works associated with the activity. This notification must include reference to the completion of the CHMP conditions, including all relevant dates. This notification must be provided via email to rap@wadawurrung.org.au.

2. Contingency Plans

In accordance with Schedule 2 Clause 13(1) of the Act, a CHMP must include contingency plans for the following:

a. the matters referred to in section 61 of the Act
b. the resolution of any disputes between the Sponsor and relevant registered Aboriginal parties in relation to the implementation of the plan or the conduct of the activity
c. reviewing compliance with the cultural heritage management plan and mechanisms for remedying non-compliance
d. the management of Aboriginal cultural heritage found during the activity; and
e. the notification, in accordance with the Act, of the discovery of Aboriginal cultural heritage during the carrying out of the activity.

Contingency 1: Proposed Changes to the Activity

The contingency plans presented in this section are specific to the activity area and the activity described within this CHMP. If, following the approval of this CHMP, changes to the activity or the activity area requiring statutory authorisation or which require any changes to the management conditions contained within the approved CHMP occur, the Sponsor must either apply to amend the approved CHMP or prepare a new CHMP which incorporates any changes.

Contingency 2: Matters Referred to in Section 61 of the Act

If Aboriginal cultural heritage is unexpectedly discovered during the activity, the following contingencies (which take into account matters referred to in Section 61 of the *Aboriginal Heritage Act 2006* (Vic) with regard to harm avoidance and minimisation) must be implemented by the Sponsor or the relevant delegate.

Contingency 3: Dispute Resolution Process

Procedures for dispute resolution aim to ensure that all parties are fully aware of their rights and obligations, that full and open communication between parties occurs and that those parties conduct themselves in good faith.

If a dispute arises that may affect the conduct of the activity, resolution between the parties using the following dispute resolution procedure is required:

1. All disputes will be jointly investigated and documented by both WTOAC and the Sponsor.
2. Where a breach of the CHMP conditions has been identified, and there is no agreement between the parties as to how that breach is to be remedied, WTOAC and the Sponsor must meet within one week of the initial notification of the breach to seek agreement as to a suitably appropriate remedial measure.
3. The Sponsor and WTOAC must arrange for authorised representatives to be present at the meeting.
4. At the meeting, the authorised representatives of both WTOAC and the Sponsor must state their understanding of the issue(s) in dispute and ensure each party is aware of their position. If requested by either WTOAC or the sponsor, third party mediation may be held during the meeting.

5. If the authorised representatives of the parties reach agreement, the agreed corrective method for the breach must be recorded in writing and signed by both parties (Agreed Method Statement). If the authorised representatives of the parties do not reach agreement, the parties will participate in third party mediation of the dispute by an agreed mediator within two weeks. Any costs of the mediation are to be met equally by the parties. Any agreed outcome of the mediation must be recorded in writing and signed by both parties (Agreed Method Statement).
6. The Sponsor, site supervisor, contractor and any relevant personnel will not undertake any correction or remedial activities except in accordance with the Agreed Method Statement. Any correction or remedial activities required must:

    i. be recorded in writing and signed off by the authorised representatives of WTOAC and Sponsor
    ii. be supervised by a WTOAC representative; and
    iii. occur in accordance with the instructions of the WTOAC representative, providing they are consistent with the agreed correction activities.

WTOAC will strive to minimise delays to work schedules while not compromising Aboriginal cultural heritage, places or values.

Issues related exclusively to cultural heritage management, which do not have an impact on the conduct of the activity, will be handled through the following dispute resolution mechanism:

1. Within one week of notification to each party that a breach is deemed to exist, authorised representatives of the WTOAC and the Sponsor must attempt to negotiate a resolution to any dispute related to the cultural heritage management of the activity area within two working days.
2. If the authorised representatives of the WTOAC and the Sponsor do not reach agreement, the parties will participate in third party mediation of the dispute by an agreed mediator within two weeks. Any costs of the mediation are to be met equally by both parties. Any agreed outcome of the mediation must be recorded in writing and signed by both parties (Agreed Method Statement).

Regardless of the category of dispute, the dispute resolution process does not preclude:

1. the parties seeking advice from First Peoples – State Relations (FP-SR) to assist in resolution of the dispute; and
2. any legal recourse open to the parties being taken; however, the parties must agree that the above resolution mechanism will be implemented before such recourse is made.

Contingency 4: Discovery of Human Remains

If any suspected human remains are found during any activity, works must cease. The Victoria Police and the State Coroner's Office should be notified immediately. If there are reasonable grounds to believe the remains are Aboriginal, the Coronial Admissions and Enquiries hotline must be contacted immediately on 1300 888 544. This advice has been developed further and is described in the following five-step contingency plan.

Any such discovery at the activity area must follow these steps:

1. Discovery:

   - If suspected human remains are discovered, all activity in the vicinity must stop; and,
   - The remains must be left in place and protected from harm or damage.

2. Notification:

   - If suspected human remains have been found, the State Coroner's Office and the Victoria Police must be notified immediately.
   - If there are reasonable grounds to believe the remains are Aboriginal Ancestral Remains, the Coronial Admissions and Enquiries hotline must be immediately notified on 1300 888 544.
   - All details of the location and nature of the human remains must be provided to the relevant authorities.
   - If it is confirmed by these authorities the discovered remains are Aboriginal Ancestral Remains, the person responsible for the activity must report the existence of them to the Victorian Aboriginal Heritage Council in accordance with Section 17 of the Aboriginal Heritage Act 2006.

3. Impact Mitigation or Salvage:

   - The Victorian Aboriginal Heritage Council, after taking reasonable steps to consult with any Aboriginal person or body with an interest in the Aboriginal Ancestral Remains, will determine the appropriate course of action as required by Section 18(2)(b) of the Aboriginal Heritage Act 2006.
   - An appropriate impact mitigation or salvage strategy as determined by the Victorian Aboriginal Heritage Council must be implemented by the Sponsor.

4. Curation and Further Analysis:

   - The treatment of salvaged Aboriginal Ancestral Remains must be in accordance with the direction of the Victorian Aboriginal Heritage Council.

5. Reburial:

   - Any reburial site(s) must be fully documented by an experienced and qualified archaeologist, clearly marked and all details provided to FP-SR.
   - Appropriate management measures must be implemented to ensure the Aboriginal Ancestral Remains are not disturbed in the future.

Contingency 5: Discovery of Aboriginal Cultural Heritage Material Other Than Human Remains

If Aboriginal cultural heritage material other than human remains is identified within the activity area at any time before, during or after the activity, the Sponsor must fulfil the following conditions:

1. At any time during construction, if suspected Aboriginal cultural heritage materials, features and/or deposits are found in the activity area, all construction that could potentially harm the suspected cultural heritage must cease, and a 10m buffer must be established around the potential find. The area must be protected from harm through the installation of temporary (mesh and wire, above ground) fencing. Only construction that is required to comply with occupational

and environmental health and safety standards and/or to protect the cultural heritage can occur within this buffer zone.

2. If any Aboriginal cultural heritage material and/or deposits are found as above, a suitably qualified and experienced archaeologist must be engaged to investigate the extent, nature, and significance of the deposit with the involvement of representatives from WTOAC (to be organised by Heritage Advisor), record in detail the location and context of the material, notify FP-SR and WTOAC, and update and/or complete and submit to FP-SR a VAHR Form.
3. In order to fulfil Section 61 requirements of the Act, the Sponsor must seek to avoid harm to any Aboriginal cultural heritage. This may include adjustments to the proposed Activity design, to avoid the extent of the site. If it is not possible to avoid harm, the Sponsor must seek to minimise harm to Aboriginal cultural heritage. This may include minimising depth of impact, adjusting the activity footprint to avoid a section of the Aboriginal cultural heritage, or utilising alternative construction techniques. If it is not possible to avoid or minimise harm, the Sponsor must work with WTOAC to determine appropriate mitigation measures. Any mitigation measures must be agreed to in writing by WTOAC. Any salvage must involve the recording, collection (labelled and packaged according to provenance), and analysis of the Aboriginal cultural heritage. The archaeologist must use a DGPS (<1 m accuracy) when mapping the cultural material. Any salvage must also include, where possible and appropriate, collection of samples suitable for dating.
4. Construction may recommence when WTOAC and the archaeologist have deemed appropriate damage avoidance action or salvage has occurred. This agreement must be documented in writing.
5. In the case of a dispute, dispute resolution contingencies are presented in Contingency 3.
6. It must be reiterated that in accordance with the Act, all cultural heritage material must be reported to the Secretary to FP-SR and WTOAC, and a Heritage Advisor must be engaged to suitably record it and submit relevant documentation to FP-SR. Significant fines occur for failing to do so, and even greater penalties exist for harming Aboriginal cultural heritage.
7. Any cultural materials associated with the protocols listed above must be subject to repatriation or reburial, following the requirements of the WTOAC.
8. The Sponsor is responsible for all costs relating to the process detailed above.

Contingency 6: Custody of Cultural Heritage

This contingency relates to the unexpected discovery of any material recovered from within the activity area during works.

Any Aboriginal cultural heritage material unexpectedly discovered within the activity area during works must be temporarily stored with the supervising archaeologist (see Heritage Advisor Details, Contingency 7) until analysis can be undertaken. Once analysis is complete, custody of all Aboriginal cultural heritage material must be assigned following the hierarchy listed below:

1. With WTOAC.
2. Any relevant registered native title holder for the land from which the Aboriginal heritage is salvaged.
3. Any relevant native title party (as defined in the Act) for the land from which the Aboriginal heritage is salvaged.

4. Any relevant Aboriginal person or persons with traditional or familial links with the land from which the Aboriginal heritage is salvaged.
5. Any relevant Aboriginal body or organisation which has historical or contemporary interests in Aboriginal heritage relating to the land from which the Aboriginal heritage is salvaged.

VAHR records managed by FP-SR must be updated by the Heritage Advisor to reflect the location of the collection once the above custody arrangements have been executed.

Contingency 7: Communication

Sufficient time must be given for written correspondence to reach parties and for a response to be composed and sent (three working days each way for mail, one to two days each way for express mail, and one day for email). Phone notification must be given when written correspondence has been posted and where possible communication should occur by phone and email. Response to any communication must occur within three working days, unless otherwise agreed by all parties concerned (but only up to a period of 10 working days).

RAP Contact Details:

Wadawurrung Traditional Owners Aboriginal Corporation
Phone: (03) 4308 0420
Email: rap@wadawurrung.org.au

Sponsor Contact Details:

Balmoral Quay Pty Ltd
Contact: Theo Axarlis
Phone: (03) 9823 3400
Email: taxarlis@gersh.com.au

Contingency 8: Access to Works Site

If the Heritage Advisor and/or WTOAC wishes to enter the activity area at any stage, this must be facilitated by the Sponsor. The Heritage Advisor and/or WTOAC must provide the Sponsor with at least three days notice prior to the time they wish to enter the activity area. The Sponsor must ensure that the Heritage Advisor and/or WTOAC is aware of any job safety restrictions or dangers and is suitably protected, and the Heritage Advisor and/or WTOAC must comply with any job safety protocols required by the Sponsor and their contractors (if relevant). These access protocols end following completion of construction.

Contingency 9: Sensitive Information and Distribution

The location and nature of cultural heritage material is sensitive information and must be dealt with accordingly and kept confidential.

Copies of the approved CHMP must be distributed to the following parties:

- Secretary, Department of Premier and Cabinet (DPC)
- WTOAC; and
- All owners/managers of land encompassed by the activity area.

Additionally, a copy of this CHMP must be kept on site during construction activity.

All Aboriginal place coordinates and details must be removed from this CHMP prior to its distribution to all parties other than those listed above, and relevant planning authorities.

Contingency 10: Compliance Review

In the event that the conditions or contingencies set out in this CHMP are not adhered to, all works must cease, and WTOAC contacted immediately. A record of the breach must include the reasons for non-compliance. All acts of non-compliance must be reported to both WTOAC and FP-SR, which may result in an investigation by an Authorised Officer or Aboriginal Heritage Officer. The Sponsor or nominated representative must take immediate action to remedy non-compliance in accordance with the relevant condition or contingency, including organising a meeting with WTOAC to discuss the non-compliance if requested to do so. Any remedial actions will be subject to written approval by WTOAC; any dispute during this process will be treated in accordance with Contingency 3.

A record of CHMP compliance must also be maintained by the Sponsor or nominated representative at all times and must be available for inspection by either an Authorised Officer or Aboriginal Heritage Officer under the Aboriginal Heritage Act 2006 or any other representative of WTOAC or FP-SR.

Table 1: Compliance Checklist

Checklist Contingency	Yes/No	If No…
Ensuring Compliance		
Have all the conditions in Section 1 of the approved Cultural Heritage Management Plan been met?		All works must immediately cease and WTOAC contacted immediately. Refer to Section 1 and Contingency 10.
Contingency Plans for Discovery of Aboriginal Cultural Heritage During Works		
If suspected human remains have been identified, have all works immediately ceased and the Coroner, the VAHC and WTOAC been contacted as per the 5-step contingency plan in Contingency 4?		All works must immediately cease and WTOAC and authorities contacted immediately. Refer to Contingency 4.
If potential Aboriginal cultural heritage has been discovered, has the correct procedure been followed as per Contingency 5?		All works must immediately cease within a 10m buffer of the suspected heritage and WTOAC contacted immediately. Refer to Contingency 5.
Management of Aboriginal Cultural Heritage Identified During Works		
Has the procedure been followed for management of Aboriginal Cultural Heritage identified during works?		Refer to Contingency 5.

PART 2

ASSESSMENT

3. Introduction

3.1. Reason for Preparing the Cultural Heritage Management Plan

Regulation 67 of the *Aboriginal Heritage Regulations 2018* (Vic) (the Regulations) requires that a cultural heritage management plan (CHMP) must include a statement regarding the reason for preparing the plan.

This CHMP (CHMP number 18376) has been prepared as a mandatory CHMP in response to regulation 7 of the Regulations, which states that a CHMP is required if all or part of the activity area for the activity is an area of cultural heritage sensitivity, and all of part of the activity is a high impact activity:

- The activity area includes land within 50m of registered Aboriginal cultural heritage places. The activity area therefore includes an area of cultural heritage sensitivity as defined under regulation 25 (Registered cultural heritage places).
- The activity area includes land within 200 m of the high-water mark of the coastal waters of Victoria. The activity area therefore includes an area of cultural heritage sensitivity as defined under regulation 31 (Coastal land).
- The activity to be undertaken in the activity area includes the construction of a residential building that will result in significant ground disturbance as defined under regulation 5 (Definitions). The activity is therefore a high impact activity as defined under regulation 46(1)(b)(xxi) (Buildings and works for specified uses).

3.2. Notice of Intention to Prepare a Cultural Heritage Management Plan

In accordance with section 54 of the Act, a formal Notice of Intention to Prepare a CHMP (NOI) (Appendix A) was submitted to the following parties by the Heritage Advisor (HA) on 11 October 2021:

- Secretary, Department of Premier and Cabinet (DPC)
- Wadawurrung Traditional Owners Aboriginal Corporation (WTOAC)
- City of Greater Geelong.

The CHMP Sponsor undertook to directly notify all owner(s) of the land within the activity area of their intention to prepare the CHMP.

3.3. Activity Area

3.3.1. Location

The activity area comprises two land parcels covering a total area of 4,471 m² (0.4 ha) and is bounded by private property to the north, Harbourside Drive to the east, Liverpool Street to the south and Balmoral Crescent to the west, within the suburb of Rippleside (Figure 1). The activity area is situated approximately 2.6 km north north-west of the Geelong CBD, within the City of Greater Geelong local government area.

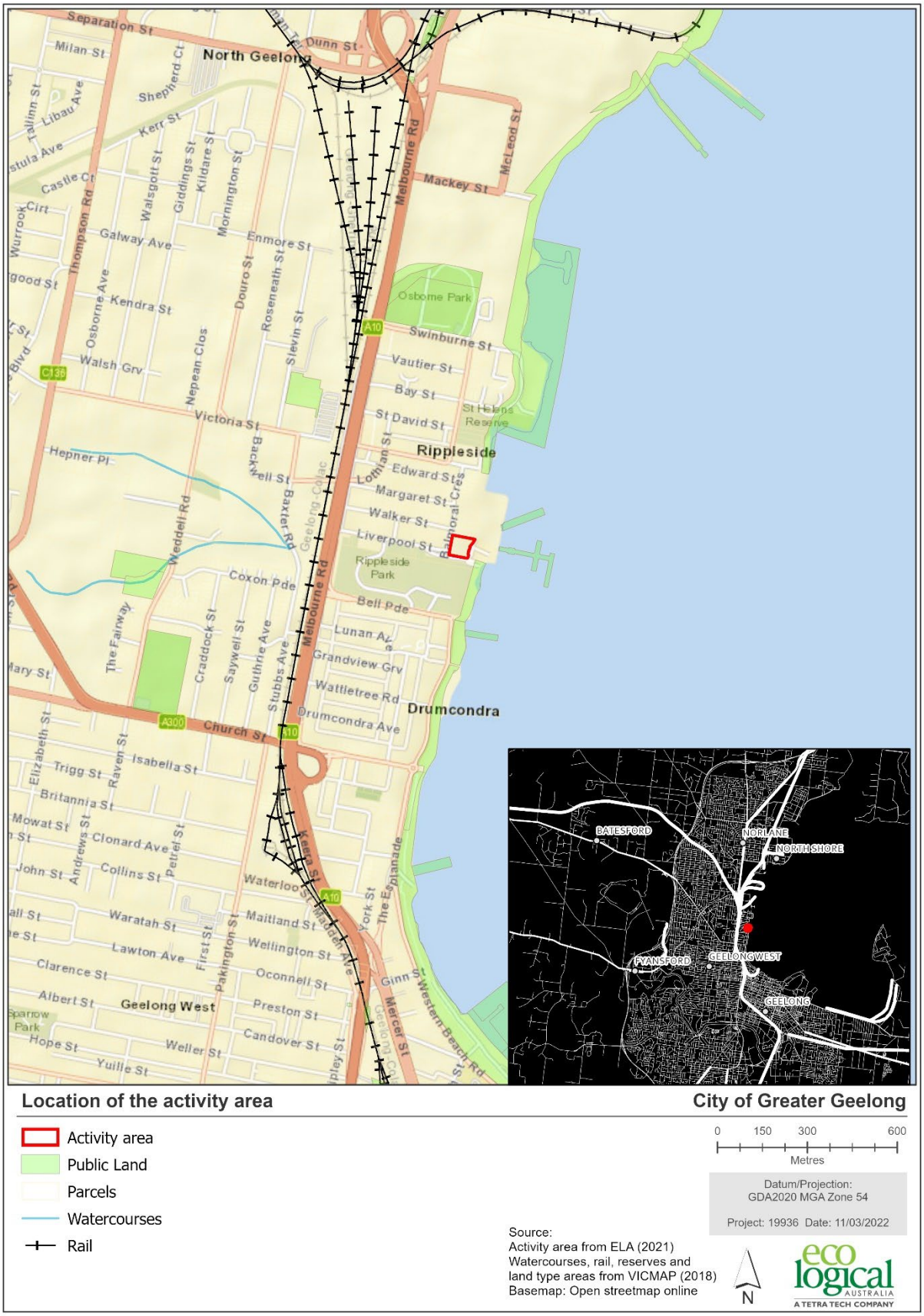

Figure 1: Location of the activity area

3.3.2. Owner(s)/Occupier(s)

The owner(s) and/or occupier(s) of the land within the activity area are listed in Table 2.

Table 2: Owner(s) and/or occupier(s) of the activity area

Street Address	Standard Parcel Identifier	Owner/Occupier
1 Harbourside Drive, Rippleside VIC 3215	S5\PS814484	Balmoral Quay Pty Ltd
11 Harbourside Drive, Rippleside VIC 3215	RES1\PS814484	Balmoral Quay Pty Ltd

3.3.3. Registered Aboriginal Parties

When the NOI for this CHMP was lodged on 11 October 2021, one Registered Aboriginal Party (RAP) had been appointed by the Victorian Aboriginal Heritage Council (VAHC) for lands including the activity area:

- Wadawurrung Traditional Owners Aboriginal Corporation Registered Aboriginal Party (WTOAC)

The Wadawurrung Traditional Owners Aboriginal Corporation was the only RAP appointed for the activity area at the time the CHMP was submitted for evaluation.

3.4. Sponsor

The Sponsor of this CHMP is:

Balmoral Quay Pty Ltd (ABN: 602 240 399)
Level 2, 650 Chapel Street, South Yarra, VIC 3141

The Sponsor's contact is:

Theo Axarlis
Phone: (03) 9823 3400, email: taxarlis@gersh.com.au

3.5. Heritage Advisor

In accordance with section 189 of the Act, this CHMP has been authored by a Heritage Advisor who has been recognised as such by FP-SR and included on their Heritage Advisor List[1].

The Heritage Advisors for this CHMP are:

Dr. Michael Green, Principal Heritage Advisor, Eco Logical Australia
PhD in Biological Anthropology, Australian National University, 1990
Bachelor of Arts (Honours) in Prehistory and Biological Anthropology, Australian National University, 1983
Industry experience: 34 years

Caroline Hawker, Heritage Advisor, Eco Logical Australia
Bachelor of Archaeology (Honours), La Trobe University, 2018

[1] https://www.firstpeoplesrelations.vic.gov.au/choose-heritage-advisor

Industry experience: three years.

The authors of this CHMP are:

Caroline Hawker, Heritage Advisor, Eco Logical Australia
Bachelor of Archaeology (Honours), La Trobe University, 2018
Industry experience: three years; and

Frances Robson, Graduate Heritage Advisor, Eco Logical Australia
Bachelor of Arts: Archaeology (Hons), University of Sydney, 2017
Industry experience: one year.

3.6. Cultural Heritage Management Plan Evaluation by a Registered Aboriginal Party

On 12 October 2021, WTOAC wrote to the Sponsor (Appendix B) to formally advise that it intended to evaluate CHMP 18376 in accordance with section 55 of the Act.

3.7. Activity Advisory Group

An Activity Advisory Group was not appointed in relation to this CHMP.

4. Activity Description

The Sponsor proposes to develop the activity area, which covers an excavated coastal cliff, for the construction of a residential building. The construction of the building forms Stage 5 of the development of the Balmoral Quay project.

The proposed residential building is a seven story, L-shaped building that will also include a basement carpark that will be entered from the existing street level at Harbourside Drive. Retaining walls will be constructed along the northern and western boundaries of the activity area. Additional ancillary works around the building will include landscaping, fencing and tree/vegetation planting.

At present, the north-eastern corner of the activity area contains a Barwon Water Pump Station and an electrical substation which will both be retained. This area will however be further developed and landscaped to include a driveway, car parking, pedestrian pathways, seating, rainwater tanks and gardens/plantings.

Site preparation works will include the removal of the existing asphalt ground surface present within the activity area at its lower ground level. The works will also require the removal of the embankments present along the northern and western boundaries of the activity area, which will be excavated to the depth of the existing lower ground level to construct retaining walls.

The residential building will be surrounded by a shotcrete perimeter retaining wall supported by driven foundational piers (expected to be approximately 600 mm in diameter). The structural designs for the residential building are yet to be finalised, however it is expected that the building will be supported by a series of rectangular foundational piers ranging in size from 1,000 x 350 mm and 1,500 x 250 mm through to 400 x 400 mm. Preliminary structural designs are provided in Figure 2. An average depth of impact of 10 m from the existing lower ground level, with a maximum depth of 12 m should be assumed across the entirety of the activity area to allow for the depth of foundational piers to be installed.

An indicative footprint and sections of the residential building are provided in Figure 3 to Figure 5.

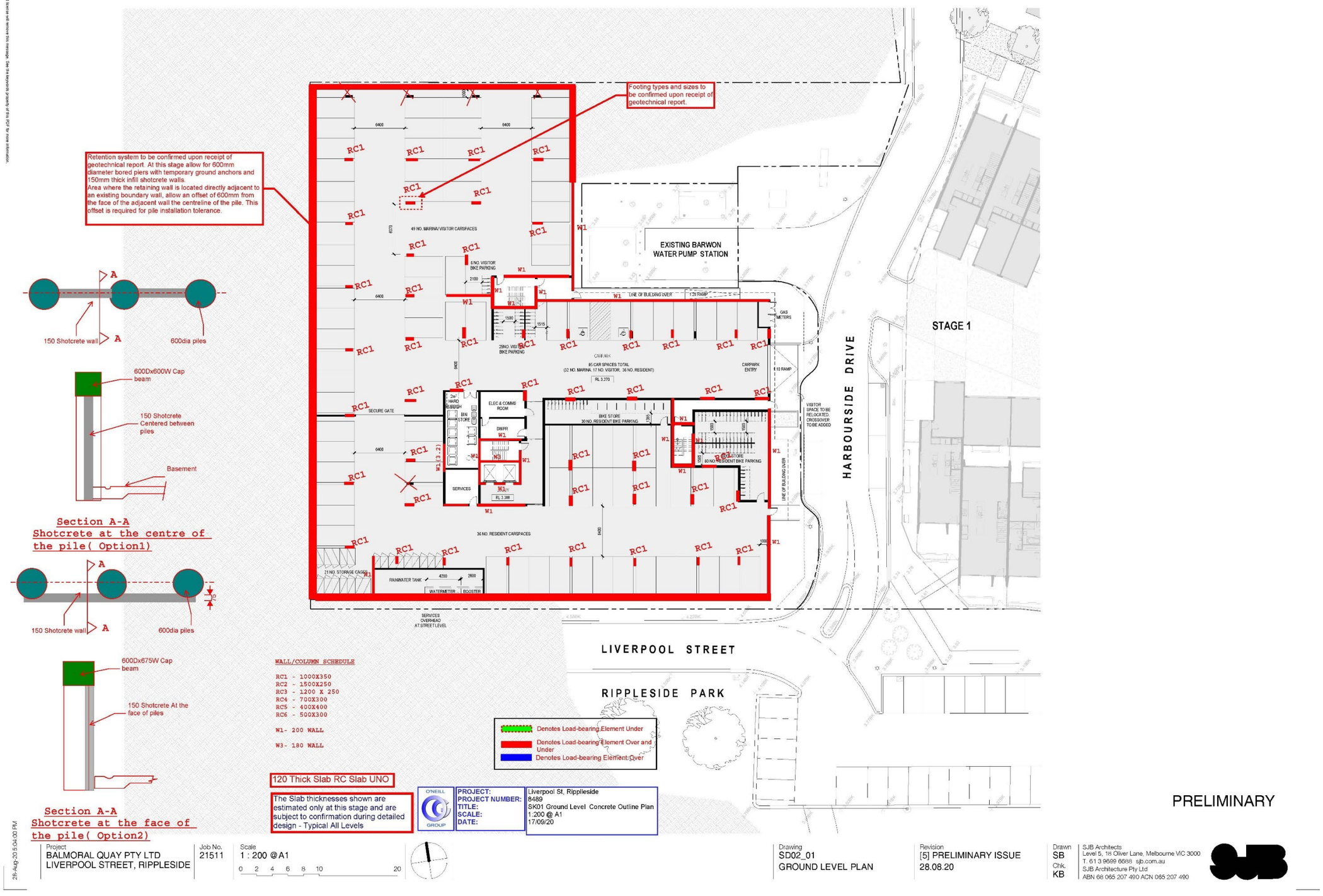

Figure 2: Preliminary ground level structural plan (courtesy Balmoral Quay Pty Ltd 2022)

Lower Ground Landscape Plan

LEGEND

- Title boundary
- 1 Shrubs and groundcover plantings
- 2 Concrete pedestrian pathway
- 3 Feature unit paving
- 4 Tenancy outdoor seating area
- 5 Bicycle maintenance station
- 6 Proposed street trees
- 7 Bench seating
- 8 Carpark vehicle entry ramp
- 9 Existing trees to adjacent Rippleside Park. Refer Arborist report prepared by 'Let's talk about Trees' March 2021
- 10 Screening planting to existing utility infrastructure
- 11 Proposed shrub and groundcover planting to embankment. Native and coastal species
- 12 Proposed rainwater tank
- 13 Visitor parking
- 14 Existing and proposed electrical infrastructure
- 15 Visitor bicycle parking
- 16 Precinct/wayfinding signage

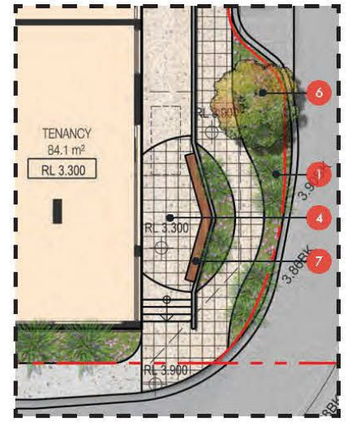

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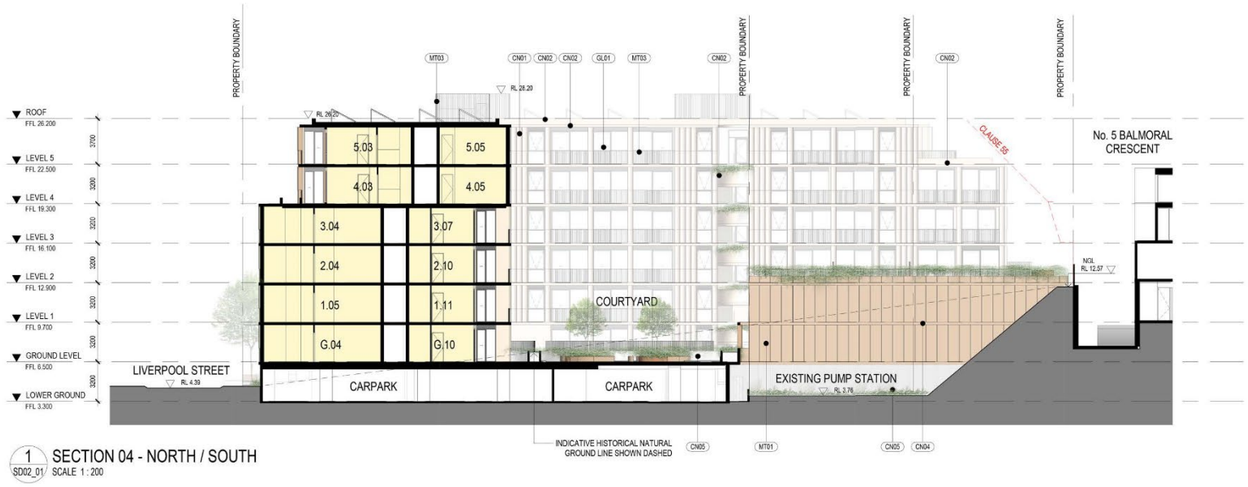
Figure 3: Indicative footprint of residential building (courtesy Balmoral Quay Pty Ltd 2021)

Figure 4: Indicative sections of residential building (courtesy Balmoral Quay Pty Ltd 2021)



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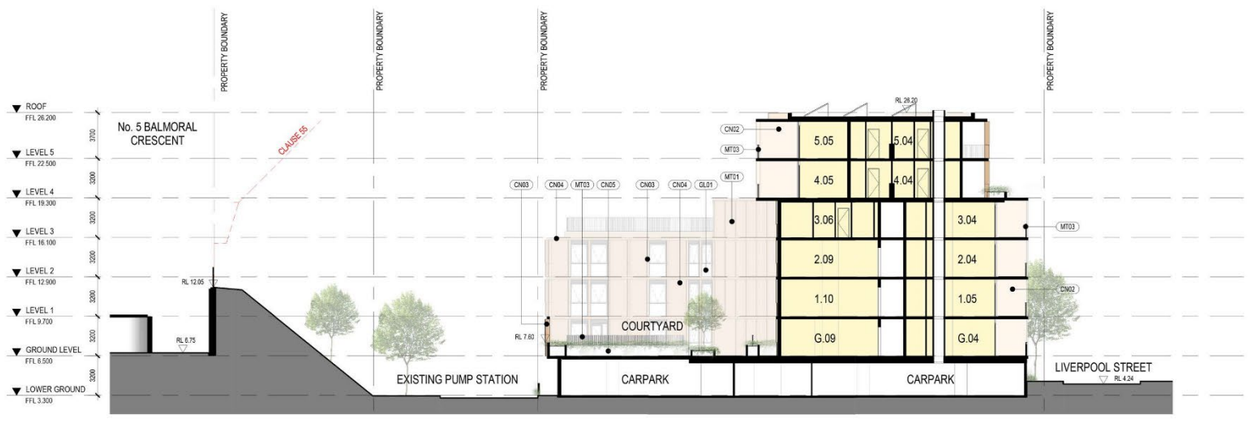

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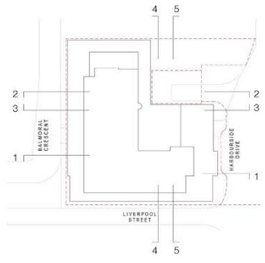

TOWN PLANNING

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SJB Architects, Level 5, 18 Oliver Lane, Melbourne VIC 3000, T. 61 3 9699 6688, sjb.com.au, SJB Architecture Pty Ltd, ABN 68 065 207 490 ACN 065 207 490

Figure 5: Indicative sections of residential building (courtesy Balmoral Quay Pty Ltd 2021)

5. Extent of Activity Area Covered by the Cultural Heritage Management Plan

The activity area is located within the suburb of Rippleside in the City of Greater Geelong, and covers an area of 4,471 m² (Figure 6). It comprises the entirety of two land parcels, S5\PS814484 and RES1\PS814484, and is bounded by private property to the north, Harbourside Drive to the east, Liverpool Street to the south and Balmoral Crescent to the west.

The activity area is located on the coastline of Corio Bay and is surrounded by residential areas to the north, east and west, and the open parkland of Rippleside Park to the south.

The activity area is situated on land currently zoned as Comprehensive Development Zone – Schedule 2 (CDZ2) under the City of Greater Geelong planning scheme. Permitted uses of land designated as CDZ2 are outlined in Appendix C. A Dial Before You Dig request also indicated that subsurface utilities are present within the activity area.

The full extent of the activity area is mapped in Figure 6 and Figure 7.

Figure 6: Photomap of the activity area

Figure 7: Map of activity area showing previously registered Aboriginal cultural heritage places within 200 m of the activity area extent.

6. Documentation of Consultation

6.1. Name and Function of Representatives Appointed by the Registered Aboriginal Party

Correspondence was received from WTOAC dated 12 October 2021, advising that the RAP intended to evaluate the CHMP (Appendix B). The names and roles of relevant representatives are listed below:

- Uncle Albert Fagan: Elder
- BJ O'Toole: Traditional Owner
- Kyle O'Toole: Traditional Owner
- Jesse Martin: WTOAC Senior Heritage Advisor
- Siobhan Privitera: WTOAC Heritage Advisor
- Tierney Brennan: WTOAC Heritage Advisor
- Jessica Mormile: WTOAC Heritage Advisor
- David Jones: WTOAC, Strategic Planning and Urban Design

6.2. Consultation Relating to the Assessment of the Activity Area

Summary information describing the nature and timing of consultation between the Sponsor and WTOAC relating to the assessment of the activity area is presented in Table 3.

Table 3: Consultation relating to the preparation of the CHMP

Date	Participants[2]	Consultation
11 October 2021	Caroline Hawker, WTOAC	Submission of Notice of Intent and CHMP map to WTOAC.
12 October 2021	Siobhan Privitera, Caroline Hawker	Notification from WTOAC that the RAP will evaluate the CHMP.
2 December 2021	Albert Fagan, BJ O'Toole, Kyle O'Toole, David Jones, Siobhan Privitera, Jesse Martin, Caroline Hawker, Theo Axarlis, David Walker, Anna Peters.	Project inception meeting with WTOAC held at WTOAC's Ballarat office and online. • CH presented the results of the desktop assessment, including a history of the development of the site, and the results of geotechnical testing. • CH suggested that the entirety of the activity area had been excavated out, except for the northern and western boundary embankments. It was suggested the embankments may contain intact subsurface deposits beneath fill, however, are unstable. • JM suggested that the presence of shell in bore holes may indicate Pleistocene era cultural heritage deposits. • AF, BJOT and KOT supported this view and requested mechanical testing. It was agreed that a standard assessment may be run concurrently with a complex assessment.

[2] Albert Fagan, WTOAC (RAP - Elder), BJ O'Toole, WTOAC (RAP – Traditional Owner), David Jones, WTOAC (RAP – Traditional Owner), Jesse Martin, WTOAC (RAP – HA), Jessica Mormile, WTOAC (RAP – HA), Kyle O'Toole, WTOAC (RAP – Traditional Owner), Kaleb Owen, WTOAC (RAP – field representative), Siobhan Privitera, WTOAC (RAP – HA), Shane Saunders, WTOAC (RAP – field representative), Tierney Brennan, WTOAC (RAP – HA)

Caroline Hawker, Eco Logical Australia (HA), Mike Green, Eco Logical Australia (HA), Zak Jones, Eco Logical Australia (HA).

Anna Peters, Balmoral Quay Pty Ltd (Sponsor), David Walker, Hub Property Group (Sponsor's Agent), Theo Axarlis, Balmoral Quay Pty Ltd (Sponsor).

Date	Participants[2]	Consultation
		• JM requested a map of the proposed pier locations and existing subsurface utilities to determine the number of test pits required.
13 December 2021	Caroline Hawker, Siobhan Privitera	CH email to SP re. age of soil deposits within the activity area, providing informal geological advice that the shell bearing layer dates to the Pliocene era and requesting a desktop level CHMP assessment only.
13 December 2021	Jesse Martin, Caroline Hawker	JM email to CH stating that in the absence of direct dating of the soil deposits, a complex testing program would still be required.
13 December 2021	Mike Green, Caroline Hawker, Jesse Martin	Phone call to discuss the requirement for complex assessment. JM indicated that a formal letter of advice from a geologist could be presented to the Traditional Owners.
22 December 2021	Caroline Hawker, Jesse Martin	CH email to JM providing a letter from a geologist concluding that the soil deposits are associated with geological units which date to >3 mya. CH requested the requirement for a complex assessment be reconsidered.
17 January 2022	Caroline Hawker, WTOAC	Email request to WTOAC for oral histories or intangible heritage values associated with the activity area.
20 January 2022	Jesse Martin, Caroline Hawker	JM email to CH, indicating that the Traditional Owners had reviewed the geological advice, and require either direct dating of the sediment or a complex assessment program.
21 January 2022	Caroline Hawker, Jesse Martin	CH email to JM, proposing a complex assessment program of 1-2 mechanical test pits.
21 January 2022	Jesse Martin, Caroline Hawker	JM email response to CH, recommending: • That if the first test pit demonstrates deposits that are too old and/or disturbed to contain cultural heritage, a second test pit would not be required. • Test pits would not be required to proceed past 1.5 m in depth. • The final location of the test pit be determined in consultation with field representatives on the day. JM requested an indicative map of the proposed test pit location for approval by the Traditional Owners.
1 February 2022	Caroline Hawker, Jesse Martin	CH email to JM providing indicative location of proposed test pit.
3 February 2022	Jesse Martin, Caroline Hawker	JM email to CH, indicating approval of the test pit location by the Traditional Owners, with permission for it to be moved during fieldwork in consultation with field representatives on the day.
22 February 2022	Caroline Hawker, Brandon Hocking, Shane Saunders, Kaleb Owen	Standard and complex assessment fieldwork.
3 March 2022	Albert Fagan, BJ O'Toole, Jesse Martin, Tierney Brennan, Jessica Mormile, Caroline Hawker, Zak Jones, Theo Axarlis, Anna Peters, David Walker.	Standard and complex assessment results meeting with WTOAC held online. • CH recapped the findings of the desktop assessment. • CH presented the outcomes of the standard assessment, which identified two investigation areas (embankments and lower ground level). A high level of disturbance was encountered across the activity area and ground surface visibility was low. • CH presented the outcome of the complex assessment, whereby one mechanical test pit was excavated which encountered gravel hardstand to 250 mm, overlying a silty clay associated with the

Date	Participants[2]	Consultation
		Tertiary Age Fyansford Formation geological deposit (dating to 10-15 million years old). • Management conditions were confirmed to include WTOAC's standard conditions, and a single heritage inspection to be timed during the stripping of the top 1.2 m of soil (fill) from the northern embankment.

6.3. Consultation Relating to the Cultural Heritage Management Plan Conditions

Summary information describing consultation between the Sponsor and WTOAC regarding the CHMP management conditions and contingencies is presented in Table 3.

6.4. Summary of Outcomes of the Consultation

Formal consultation between the HA, the Sponsor and WTOAC included:

- A project inception meeting held on 2 December 2021.
- A request via email for oral histories or intangible heritage values associated with the activity area from the Wadawurrung Elders and Traditional Owners on 17 January 2022.
- A post-standard and complex assessment meeting held on 3 March 2022 to present the results of fieldwork and to discuss management conditions.
- Management conditions were agreed to include WTOAC's standard set of management conditions, including (but not limited to):
    - A cultural heritage induction
    - A single heritage inspection to be timed during the stripping of the top 1.2 m of soil (fill) from the northern embankment. Monitoring may also occur during this heritage inspection in line with the Occupational Health and Safety constraints of the worksite.

7. Aboriginal Cultural Heritage Assessment

7.1. Desktop Assessment

7.1.1. Introduction

The Aboriginal cultural heritage desktop assessment of the activity area was prepared pursuant to regulation 61 and clause 8(1), Schedule 2 of the Regulations.

The aims of the desktop assessment were to assess:

- The level of previous investigation of the activity area and the wider geographic region.
- Evidence for the presence of registered Aboriginal cultural heritage places within the activity area.
- The environmental context of the activity area with regard to landform, geomorphology and geology, and the vegetation which would have characterised the area prior to European contact.
- Historical and ethnohistorical evidence for the presence of Aboriginal people in the activity area and geographic region.
- Evidence for the presence of intangible Aboriginal cultural heritage values that may be present in or associated with the activity area, and which may be impacted by the activity.
- Prior use of the activity area, especially regarding evidence of prior disturbance to ground surfaces and subsurface deposits.

The methods used to undertake the desktop assessment included:

- Searching relevant Victorian government online information.
- Searching the Victorian Aboriginal Heritage Register (VAHR) and other archaeological resources (e.g., consultancy reports) for information relating to the activity area and the geographic region.
- Reviewing and analysing this information to identify and characterise the Aboriginal cultural heritage site types and locations likely to be present within the activity area.

7.1.2. Obstacles Encountered in Completing the Assessment

No obstacles were encountered which prevented completion of the desktop assessment.

7.1.3. Geographic Region

The purpose of the geographic region is to provide a comparative context that can be used to better understand the likely environmental and cultural heritage values that would have been available to Aboriginal people in the past, and which may have influenced the likelihood that Aboriginal cultural heritage places would have been created and then retained intact within the activity area. The geographic region therefore needs to be constructed in a way that captures this data in sufficient detail to be of use.

A preliminary review of the VAHR and other online resources conducted on 25 October 2021 indicated that place registrations in the region tend to cluster along the coastline and in proximity to watercourses.

A geographic region was therefore constructed as an irregular polygon stretching approximately 3 km north and south of the activity area, capturing the land between the Moorabool River in the west and the coastline in the east. This distance was required in order to capture sufficient data on Aboriginal cultural heritage place types and their locations within environments similar to those within and near the activity area. A map of the geographic region is presented in Figure 8.

7.1.4. Landforms and Environment

7.1.4.1. Geology and Geomorphology

Unless otherwise referenced, the following landform, geological and geomorphological descriptions are derived from online resources developed by the Victorian Government, including GeoVic 3 (Department of Economic Development, Jobs, Transport and Resources 2018) and Victorian Resources Online (Agriculture Victoria 2021). The geomorphology and geology of the activity area and geographic region are mapped in Figure 9 and Figure 10 respectively.

The activity area is situated within subunit 8.7 (Engineered coast – Port Melbourne) of the Coast geomorphological unit as defined within Victoria's Geomorphological Framework (Figure 9). Subunit 8.7 is an entirely engineered landform and has been heavily modified by urban and industrial development, coastal settlement and recreational use. No further information on the Engineered coast – Port Melbourne geomorphological subunit is provided within the Victorian Geomorphological Framework maintained by Agriculture Victoria (2021).

The wider landscape of the surrounding geographic region falls largely within the Western Plains geomorphological division. The Victorian Western Plains are made up of low-lying undulating plains formed on both volcanic and sedimentary lithologies. The landscapes of this geomorphological unit are formed on some of the youngest rocks in Victoria. Soils on the Western Plains reflect the underlying lithology and age of the rocks. The youngest landscapes – the stony rises – have skeletal uniform or gradational soils, whereas the earlier lava flows have deeper soils varying from friable gradational to strongly texture contrast soils. Much of the area is a natural grassland plain, bounded by the Western Uplands to the north, and the coastline and Otway Range, part of the Southern Uplands to the south.

The volcanic plains were built up by sporadic eruptions over a period of approximately 5 million years and are known geologically as the Newer Volcanics. Much of the plains were formed from lobes of lava which flowed from the eruption points, overlapping to form a veneer of basalt lava flows. The flow varies in thickness according to both the underlying topography and the present-day surface. The flows are interleaved in places with pyroclastic deposits (scoria and tuff) and discontinuous buried palaeosoils of variable thickness.

The wider geographic contains the following Western Plains geomorphological subunits:

- Subunit 6.1.3 (Plains with poorly developed drainage and shallow regolith): occurs on a north-south orientation across the geographic region and is characterised by thin regolith development and poorly developed drainage.
- Subunit 6.2.4 (Plains and plains with low rises): located southeast of the activity area and forms generally flat landscapes with very gentle low rises.

- Subunit 6.2.5 (Terraces and floodplains and coastal plains): located to the southwest of the activity area within the geographic region, and includes alluvium, alluvial terraces and floodplains.
- Subunit 6.2.4 (Plains and plains with low rises): located parallel to the coastline within the geographic region and includes generally flat landscapes with very gentle low rises.

The wider geographic region also captures areas of the Southern Uplands geomorphological division. West of Port Phillip Bay, the Victorian Southern Uplands form the high relief and moderate elevation areas (250–600 m) of the Otway Ranges, low relief and low elevation (100–250 m) areas of the Barrabool Hills, and the very low relief and very low elevation (<100 m) areas of the Bellarine Peninsula. These landscapes were formed by the uplift of a structurally controlled block of lithic sedimentary rocks of the Lower Cretaceous Otway Group or Neogene sediments. The Barrabool Hills and Bellarine Peninsula are smaller fault-bounded uplift blocks at lower elevations than the Otway Ranges, and are generally more planar and less deeply dissected.

The geological units of the Southern Uplands vary considerably in their degree and depth of weathering. The rocks and sediments of the Bellarine Peninsula are much more varied than the Otway Ranges and the Barrabool Hills and comprise mainly basalts of the Older Volcanics (Paleogene) and Early Neogene marine sands.

The wider geographic contains the following Southern Uplands geomorphological subunits:

- Subunit 3.2.2 (Ranges): located along the southeast of the geographic region and comprises characteristically rounded hills separated by broad valleys.

The activity area is underlain by two mapped geological substrates (Figure 10):

- Black Rock Sandstone (Nbb): includes a variety of sand, sandstone, conglomerate, minor sandy limestone and local ironstone, and is generally very well sorted and variably cemented. Nbb contains shelly fossils and burrows and was laid down during the Miocene to Pliocene periods (23 million years ago (mya) to 5 mya).
- Gellibrand Marl (Ntg): includes marl, mudstone, sandstone, calcarenite, minor lignite, ligneous clay, abundant carbonate nodules and shelly fossils and microfossils. Ntg was laid down during the Miocene period (23 mya).

Other surface geologies within the geographic region are primarily located in proximity to major waterways, such as the Moorabool River, and include:

- Coastal Dune Deposits (Qdl1)
- Newer Volcanic Group (Neo)
- Alluvium (Qa1)
- Alluvial terrace deposits (Qa2)

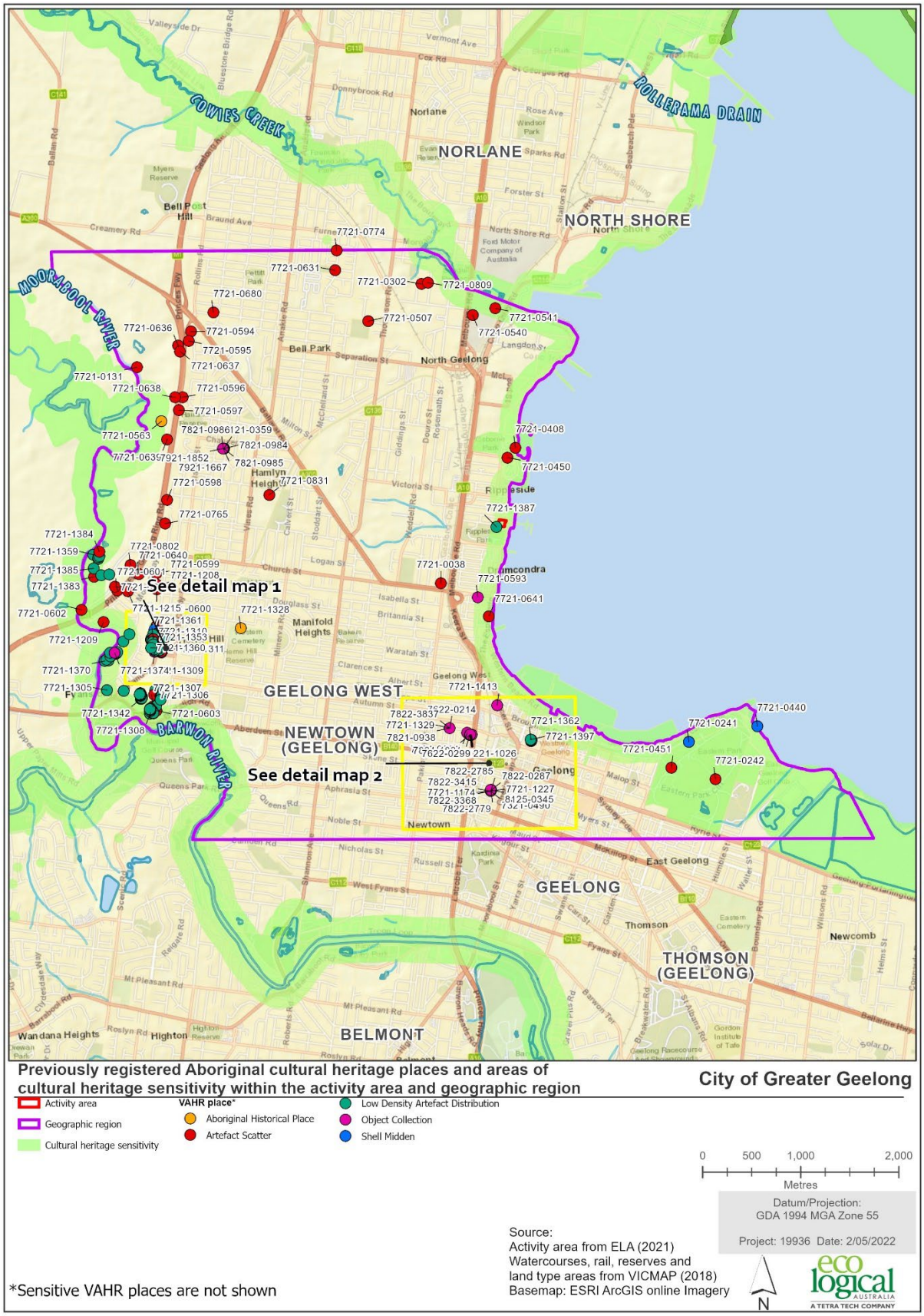

Figure 8: Previously registered Aboriginal cultural heritage places and area of cultural heritage sensitivity within the activity area and geographic region

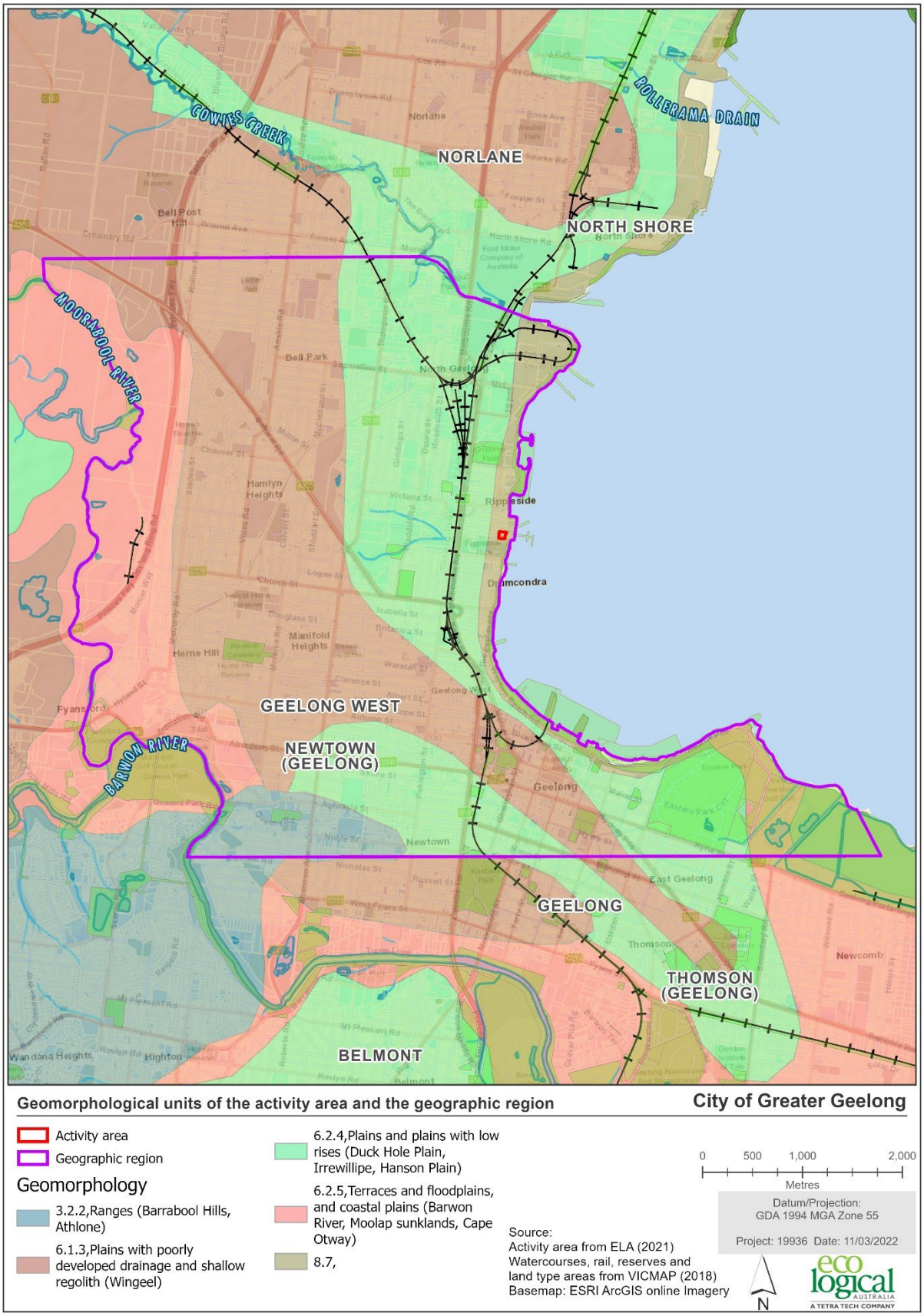

Figure 9: Geomorphological units of the activity area and the geographic region

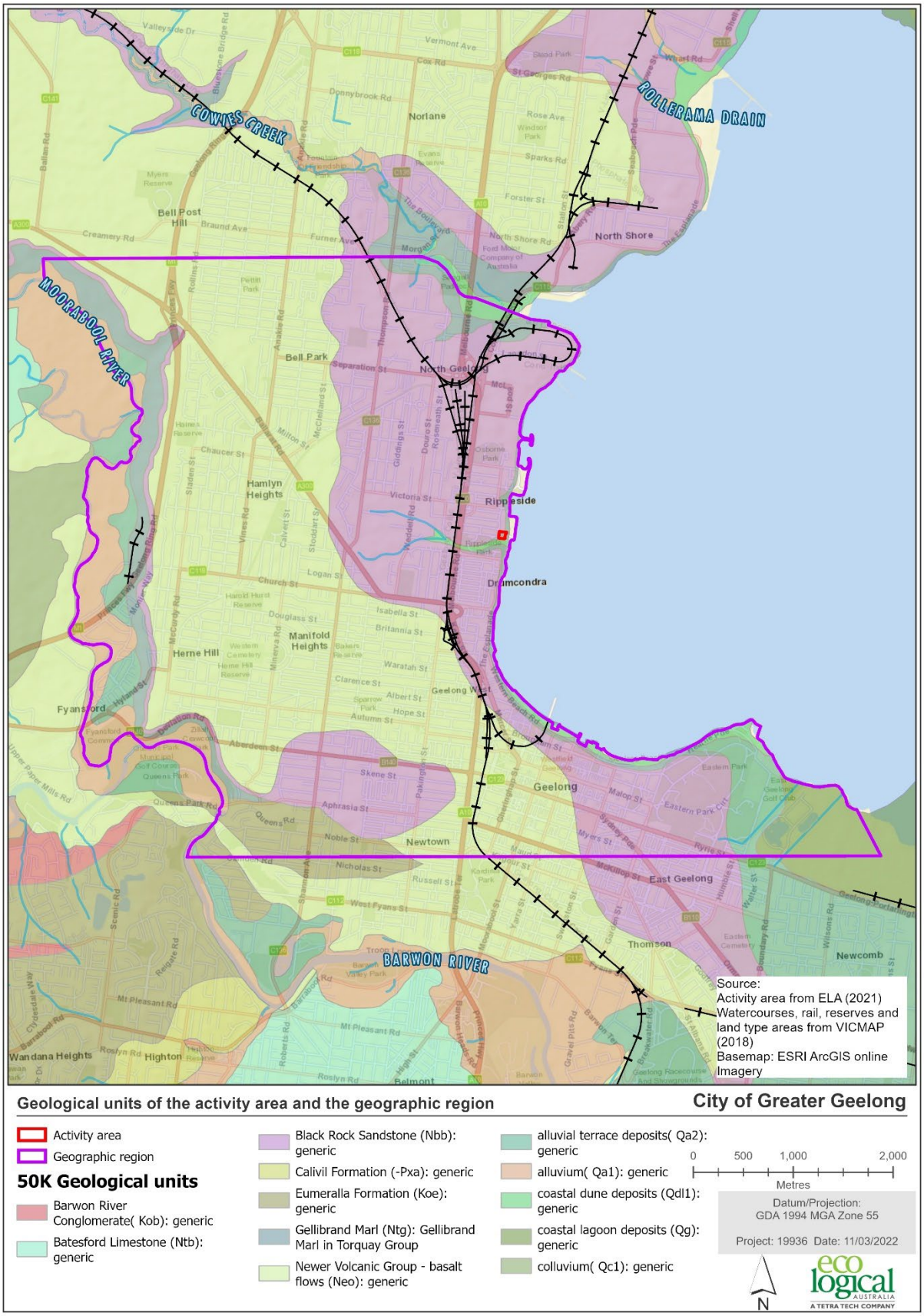

Figure 10: Geological units of the activity area and the geographic region

7.1.4.2. Soils

The activity area is located within a land system identified as 7.1PfT5-1, which is described as mottled duplex soils with high compaction.

Geotechnical testing was undertaken within the activity area, within both the upper ground level and lower ground level portions of the activity area (Douglas Partners 2019). A bore hole drilled within the upper ground level portion of the activity area (top of the embankment) identified the following subsurface conditions (full bore logs are located in Appendix D):

- Bore Hole BH101:
    - **0 - 1.25 m**: dry fill/gravelly sand, fine to coarse; grey; gravel is fine to medium; trace silt.
    - **1.25 - 3.5 m**: moist clayey sand, fine to medium; grey brown; marine deposits. Between 1.5-3.5 m in depth, becoming brown, orange.
    - **3.5 - 8.5 m**: moist clayey silt, brown orange; with fine grained sand; marine deposits.
    - **8.5 – 14.95 m:** moist silty clay, yellow pale brown; trace of calcareous fragments; with shell fragments from 11.5 m to 13 m; marine deposits. Trace of fine sand below 14.5 m.
    - Bore discontinued at 14.95 m in depth.

Bore holes drilled within the lower ground level portion of the activity area (base of the embankment) identified the following subsurface conditions (Appendix D):

- Bore Hole BH102:
    - **0 – 7.4 m**: moist silty clay, pale brown yellow; marine. Moisture content increasing below 2.5 m. Between 2.9 – 4 m in depth, becoming pale brown grey. Below 4 m in depth, becoming pale brown, yellow, mottled orange with calcareous fragments. Below 5.5 m, traces of fine sand, and cemented band. Between 7.35-7.4 m, sand band.
    - **7.4 – 10.45 m**: wet sandy clay; pale brown; fine grained sand with calcareous fragments; marine.
    - Bore discontinued at 10.45 m in depth.

The geotechnical testing report was reviewed by a geologist with the aim of understanding the geological names and ages of the soil deposits encountered within the bore holes drilled within the activity area (Wilson 2021) (Appendix E). Wilson (2021) concluded that the materials encountered within the bore holes can be divided into three layers, as shown in Table 4.

Table 4: Summary of Douglas Partners (2019) borehole logs

Layer	Thickness (m)	Brief description
1	1.1, 1.2	Fill: Gravelly Sand and Sandy Gravel, grey. Present in BH101, BH103.
2	2.3	Clayey Sand, grey-brown to orange-brown. Present in BH101 only.
3	>11.4, >10.4, >9.3	Silty Clay (1), brown-orange to pale yellow brown, becoming Sandy Clay. With bands of calcareous fragments and occasional cemented bands. Present in all boreholes.

Based on the soil descriptions, published geological information and experience working in the Corio area, Wilson (2021) interpreted the three layers as follows:

- Layer 1: Fill
- Layer 2: Tertiary age Moorabool Viaduct Sand; based on the material comprising dense to very dense, orange-brown (ferruginous) sand, and being present above reduced level 10.8m in the upper parts of the site.
- Layer 3: Tertiary age Fyansford Formation; based on the material comprising stiff to hard silty clay with fossiliferous layers (described as calcareous fragments) and occasional cemented bands, and being present beneath the lower parts of the site and extending below sea level.

As such, Wilson (2021) interprets Layer 2 as being circa 3 to 5 million years old, and Layer 3 as being circa 10 to 15 million years old.

7.1.4.3. Climate and Vegetation

The climate of Australia has altered and fluctuated since the time of earliest human occupation during the Pleistocene, around 60,000 years ago. During the Pleistocene, lower sea levels were present across Australia, and the southern coastline extended southwards, connecting Tasmania to the Australian mainland (Cosgrove 1999: 362). During the late Pleistocene and early Holocene, sea levels began to rise in response to post-glacial marine transgression resulting from the melting of Late Pleistocene ice sheets (Lambeck and Nakada 1990: 143). This rise in sea levels separated Tasmania from the mainland and reduced the Australian coastline. Victorian sea levels stabilised and reached modern levels before around 6,000 years ago (Lambeck and Nakada 1990: 149).

During the period of Aboriginal occupation of the Melbourne region, the climatic conditions varied greatly in regard to temperature and rainfall levels. During the Last Glacial Maximum (21,000 to 15,000 years ago), temperatures were approximately 6 to 10 degrees lower than today (Mulvaney & Kamminga 1999: 116). During the late Pleistocene there was less precipitation throughout the continent, reducing the woodland forest areas of southern Australia and resulting in a predominance of grasslands. Within this time there is evidence for dry/shallow lakes with conditions likely to have been too dry to support swamp or open-water environments (Bowler 1981: 436-437; Aitken and Kershaw 1993: 76). The inland of Australia was characterised by arid and dry conditions.

In the late Pleistocene to early Holocene (12,000 to 9,000 years ago), warmer temperatures and increased precipitation resulted in the expansion of woodland and forest areas dominated by eucalypts (Aitken and Kershaw 1993: 67).

Fluctuating environmental conditions persisted throughout the Holocene, with data indicating that after 5,000 years ago, rainfall was lower which resulted in a more open eucalypt canopy with an understorey mosaic of heath, bracken and grassland. This may also be connected to evidence for increased burning, which is indicated by relatively high levels of charcoal (Aitken and Kershaw 1993: 78). Palaeoecological studies of the Gippsland Lakes also indicate that lower levels of moisture were available during the late Holocene, with fluctuating fresh water conditions experienced at Lake Wellington (Reid 1989: 48). Data from crater lakes in south-western Victoria also show a decline in water levels during the mid-Holocene, with a more substantive decline after approximately 5,000 years ago, and water levels oscillating

perhaps as a result of fluctuating temperatures until the later Holocene from around 1,800 to 1,300 years ago (Wilkins *et al.* 2013: 8, 10).

The present climate of the geographic region is generally described as warm and temperate with significant rainfall. Climate statistics for the nearby Breakwater (Geelong Racecourse) weather station[3] record a mean maximum temperature ranging between 19.1 °C in July and 30.1 °C in February and a mean minimum ranging between 10.7 °C in July and 18.2 °C in February. The mean annual rainfall for the same site is 353.2 mm.

The activity area lies within the Victorian Volcanic Plain bioregion. Descriptions of the likely Ecological Vegetation Classes (EVCs) that would have been dominant in the area prior to 1750 have been derived from modelling developed by the Department of Environment, Land, Water and Planning (2018b and 2018c) (Figure 11).

The activity area spans one EVC group: Lower Slopes or Hills Woodlands. The specific EVC that would have been present across the activity area is EVC 175, Grassy Woodland, described as a variable open eucalypt woodland (<15 m tall) or occasionally Sheoak/Acacia woodland (< 10 m tall) overlying a diverse ground layer of grasses and herbs.

Other EVCs that would have been present across the geographic region include:

- EVC 132 (Plains Grasslands and Chenopod Shrublands): Treeless vegetation mostly less than 1 m tall, dominated by largely graminoid and herb life forms. Occupies soils prone to seasonal waterlogging in areas receiving less than 500 mm annual rainfall.
- EVC 56 (Riverine Grassy Woodlands or Forests): An open, eucalypt woodland to 20 m tall overlying a medium to tall shrub layer. A ground layer consisting of amphibious and aquatic herbs and sedges underlies the upper two storeys. Occurs along banks and floodplains of the larger meandering rivers and major creeks, often in conjunction with one or more floodplain wetland communities. Elevation and rainfall are relatively low, and soils comprise fertile alluviums. These areas are subject to periodic flooding and inundation.
- EVC 851 (Riparian Scrubs or Swampy Scrubs and Woodlands): Tall shrubland to 8 m tall above a ground layer of sedges and herbs. A sparse eucalypt overstorey to 15 m tall may sometimes be present. Occurs along rivers and major streams where the watercourse consists of either rocky banks, a flat rocky stream bed or broad gravel banks which are often dry but are also regularly flooded by fast flowing waters.
- EVC 55 (Plains Grassy Woodland): An open, eucalypt woodland to 15 m tall. Occupies poorly drained, fertile soils on flat or gently undulating plains at low elevations. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer. This variant occupies areas receiving approximately 500 – 700 mm annual rainfall.
- EVC 302 (Salt-tolerant and/or succulent Shrublands).

[3] Climate Data Online - Map search (bom.gov.au) (accessed 16th November 2021).

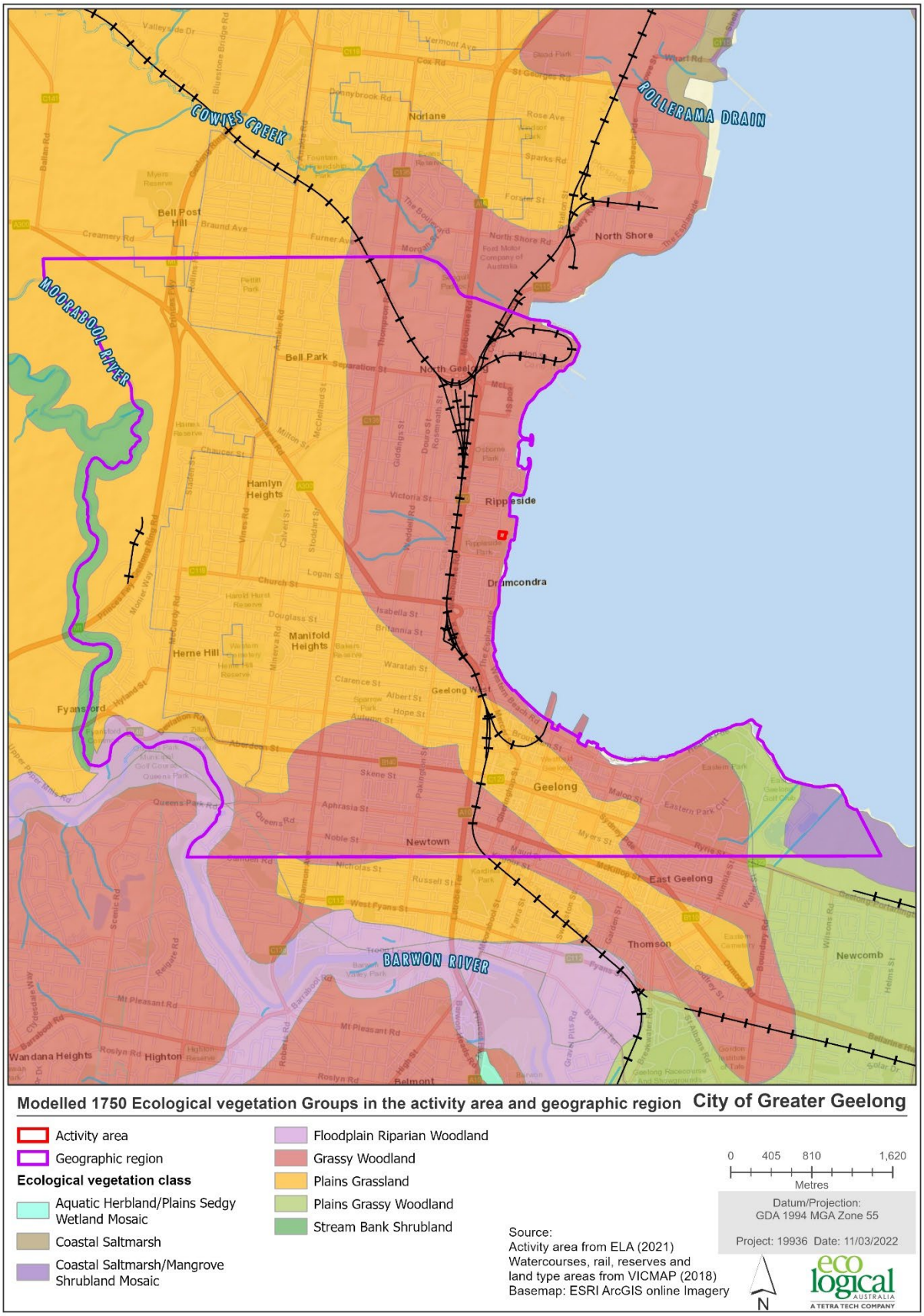

Figure 11: Pre-1750's ecological vegetation classes in the activity area and geographic region.

7.1.5. Victorian Aboriginal Heritage Register Search

A search of the Victorian Aboriginal Heritage Register (VAHR) covering the full extent of the activity area and the wider geographic region was initially conducted on 25 October 2021. This was followed by a search on 25 February 2022 to ensure that the information presented below is current. The VAHR was searched using the online Aboriginal Cultural Heritage Register and Information System (ACHRIS) maintained by FP-SR (First Peoples – State Relations 2021).

All registered Aboriginal cultural heritage places located within the geographic region are mapped in Figure 8, Figure 12 and Figure 13 and listed below in Table 5.

A total of 60 registered Aboriginal cultural heritage places (Table 5) are located within the geographic region. Two historical references to Aboriginal activity are also situated within the geographic region.

No Aboriginal cultural heritage places have previously been recorded within the activity area.

The closest registered Aboriginal cultural heritage place is VAHR 7721-1387 (Rippleside Park LDAD1), a low-density artefact distribution located approximately 20 m south-west of the activity area within Rippleside Park. VAHR 7721-1387 comprises a single silcrete distal flake, identified in subsurface deposits at a depth of 200 mm, during investigations for CHMP 15893 (Young and Barker 2018). The artefact was identified within imported fill containing glass, metal and plastics.

The registered Aboriginal cultural heritage places located within the geographic region include:

- 48 (75%) artefact scatters
- 10 (16%) low density artefact distributions
- 3 (5%) shell middens; and
- 2 (3%) Aboriginal historical places[4].

[4] The total does not add up to 60 since several VAHR places have multiple component types. Sensitive VAHR place registrations have been omitted from this list at the request of the RAP.

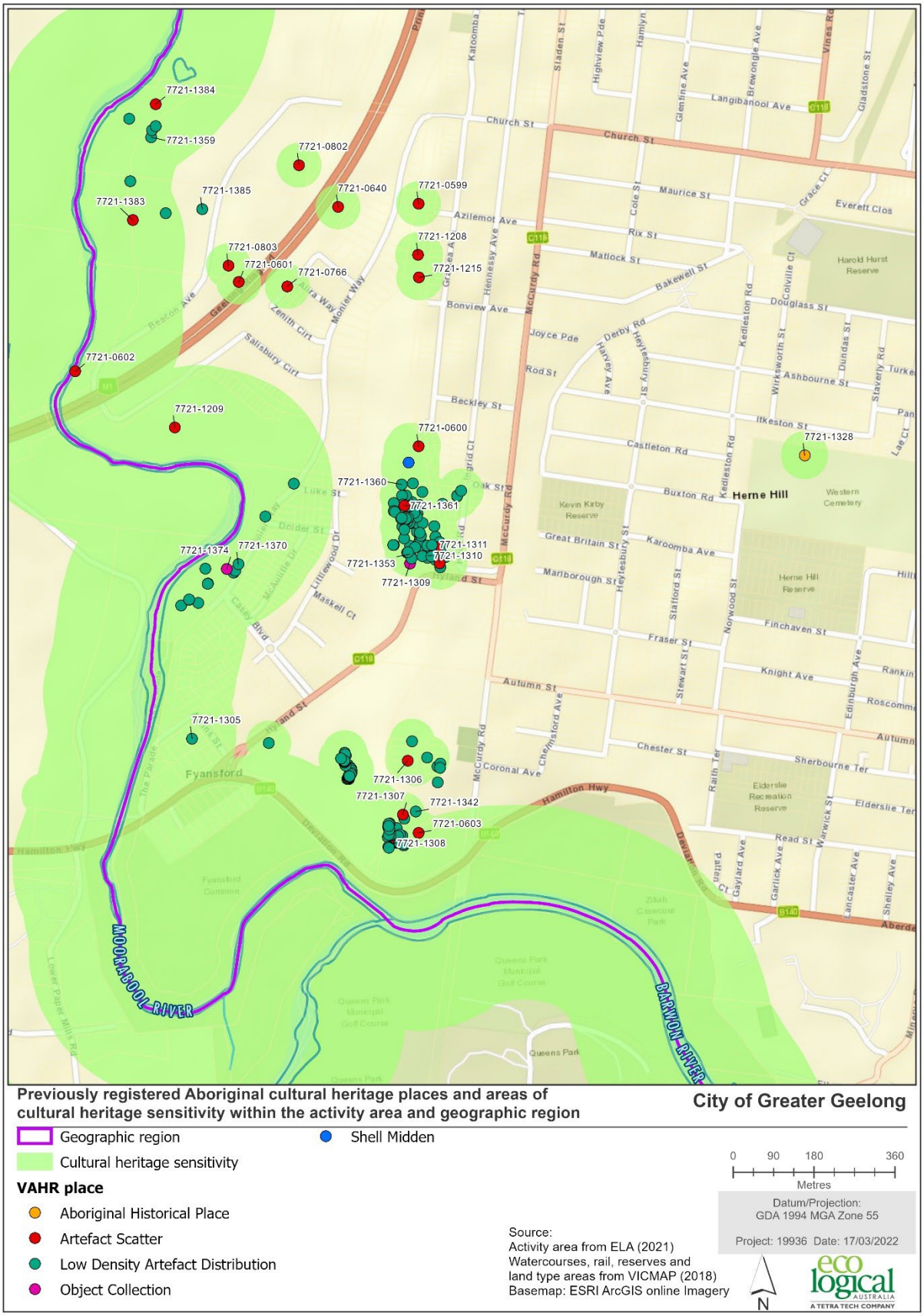

Figure 12: Previously registered Aboriginal cultural heritage places and area of cultural heritage sensitivity within the activity area and geographic region – Detail Map 1

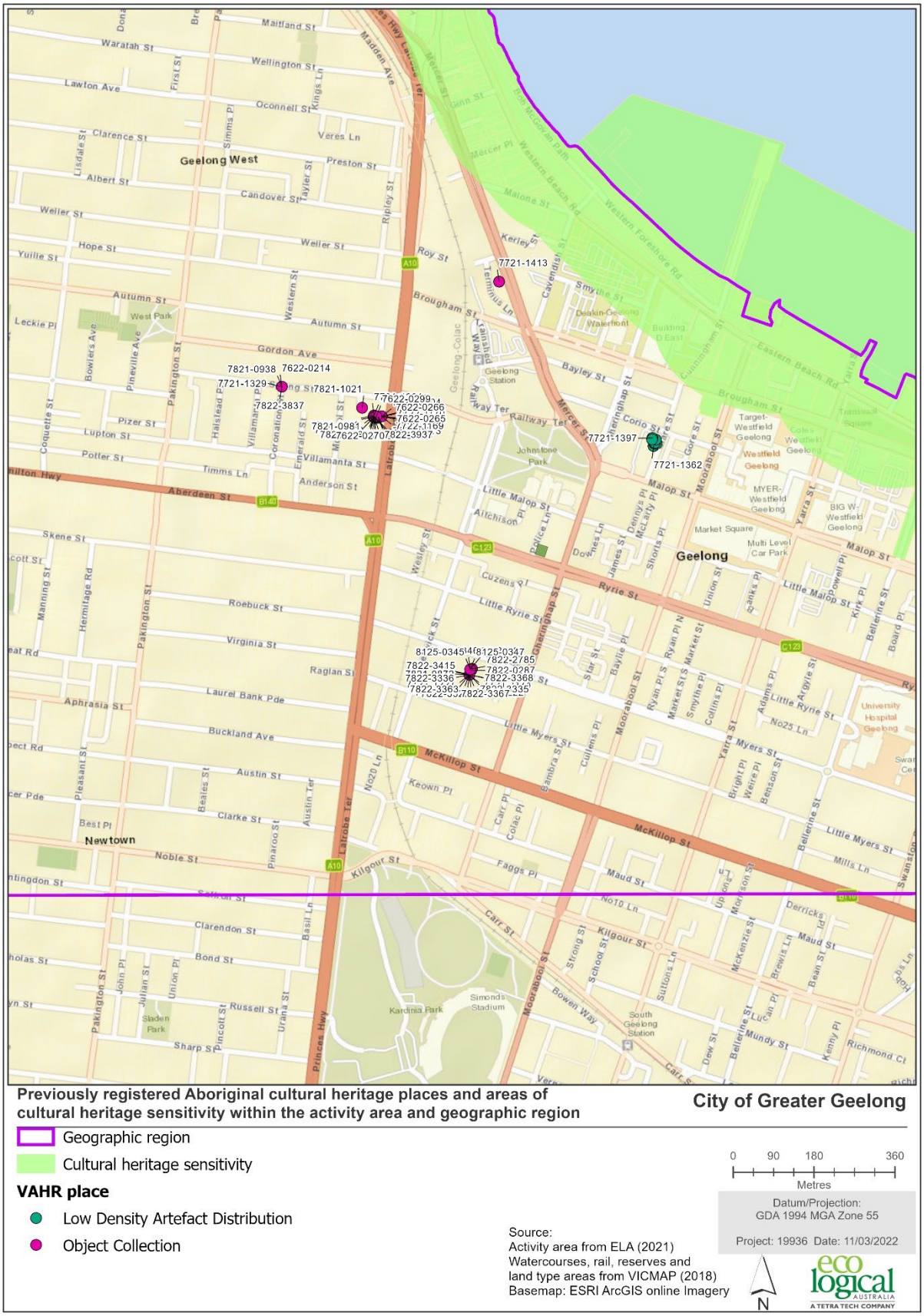

Figure 13: Previously registered Aboriginal cultural heritage places and area of cultural heritage sensitivity within the activity area and geographic region – Detail Map 2

Table 5: Registered Aboriginal cultural heritage places located within geographic region

VAHR No.	Place Name	Place Type	Surface/ subsurface	Depth cultural material (mm)	No. artefacts	Materials[5]	Contents	Landform
7721-1383	355 Church Street, Fyansford Artefact Scatter 1	Artefact Scatter	Subsurface	0-250	12	B, Q, Qz, S	Flakes, retouched flakes, flake fragments	Plain
7721-1384	355 Church Street, Fyansford AS2	Artefact Scatter	Subsurface	0-1100	21	Q, S	Flakes, flake fragments, angular fragments	Plain
7721-1385	355 Church Street, Fyansford LDAD 1	LDAD	Surface/ Subsurface	0-200	12	Q, S, Ss	Flakes, angular fragments	Plain
7721-0302	Batesford 1	Artefact Scatter	Not Specified	_	_	C, F, S	Flakes, flake fragments, cores, unspecified chipped stone artefacts, European material (glass & ceramic)	Floodplain
7721-0631	Bell Park 2	Artefact Scatter	Subsurface	0-300	32	C, F, Q, S	Flakes, flake fragments, cores, angular fragments	Lowland Plain
7721-0440	Bloxhams Beach 1	Shell Midden	Surface/ Subsurface	0-300	_	Shell	Velacumantus, mollusc shell	Rocky Shore
7721-1362	Carlton Hotel	LDAD	Subsurface	500-1000	6	S	Flakes, flake fragments, blades, angular fragments	Not specified
7721-0241	Eastern Park (Geelong) 1	Artefact Scatter	Surface	-	Not specified	B, C, F, Q, Qz, Other	Cores, unspecified chipped stone artefacts, axe	Hill/ Escarpment
7721-0241	Eastern Park (Geelong) 1	Shell Midden	Surface	_	Shell	Charcoal, Shell	Charcoal, Mollusc shell	Hill/ Escarpment
7721-0242	Eastern park (Geelong) 2	Artefact Scatter	Surface	-	Not Specified	C, F, Qz	Flakes, unspecified chipped stone artefacts	Levee, Bank

[5] B: Basalt, C: Chert, Ce: Ceramics, F: Flint, G: Glass, Gr: Greenstone, H: Hornfels, O: Other, Q: Quartz, Qz: Quartzite, RQ: Rose Quartz, S: Silcrete, Ss: Sandstone T: Tachylite.

VAHR No.	Place Name	Place Type	Surface/ subsurface	Depth cultural material (mm)	No. artefacts	Materials[5]	Contents	Landform
7721-0540	Ford IA 1	Artefact Scatter	Surface	_	2	Q, S	Flake, unspecified chipped stone artefact	Escarpment
7721-0541	Ford SAS 1	Artefact Scatter	Surface	_	Not Specified	Q, Qz, S	Flakes, scraper, unspecified chipped stone artefact	Floodplain
7721-0641	Frank Moore Reserve 1	Artefact Scatter	Surface	_	1	S	Flake	Escarpment/ Cliff
7721-0603	Fyansford Artefact Scatter	Artefact Scatter	Surface/ Subsurface	0-400	92	Q, Qz, S, unspecified material	Flakes, flake fragments, blade flakes, angular fragement	Escarpment
7721-1305	Fyansford LDAD	LDAD	Surface/ Subsurface	0-600	78	B, Q, Qz, S	Flakes, angular fragments, slab, cobble/pebble, blade	Plain
7721-1353	Fyansford Quarry LDAD 5	LDAD	Surface	-	19	Q, Qz, S	Flakes, angular fragments, blades	Escarpment
7721-1360	Fyansford Quarry LDAD 6	LDAD	Surface	-	20	B, Q, Qz, S	Flakes, cores, angular fragements	Escarpment
7721-1342	Fyansford Quarry LDAD Part 2	LDAD	Surface	-	118	Q, Qz, S	Flakes, cores, blades, angular fragments	Plain
7721-0802	Geelong Bypass 31	Artefact Scatter	Subsurface	0-500	2	Q	Flakes	Hill/ Ridge
7721-0803	Geelong Bypass 32	Artefact Scatter	Subsurface	0-650	11	Q, S	Flakes, flake fragments, blades, angular fragments	Hill/ Ridge
7721-0563	Geelong Protectorate	Aboriginal Historical Place	-	-	-	-	Reserve until 1850 when divided up for selection and settlement	Hill/ Fluvial/ Lacustrine
7721-0599	Hamelyn Heights 1	Artefact Scatter	Surface/ Subsurface	0-600	21	Q, S, Siltstone	Flakes, broken flakes, angular fragments	Escarpment
7721-0600	Hamleyn Heights 2	Artefact Scatter	Surface/ Subsurface	0-500	264	CQ, Gr, Q, S, Siltstone	Flakes, cores, blades, scrapers, axes, angular fragments, split pebble	Escarpment
7721-0600	Hamleyn Heights 2	Shell Midden	Surface/ Subsurface	Not specified	45	Shell	Mud cockle, mud ark, mud oyster, mud whelk	Sandy Shore/ Muddy Shore
7721-0601	Hamelyn Heights 3	Artefact Scatter	Surface	-	1	S	Flake	Lowland Plain

VAHR No.	Place Name	Place Type	Surface/ subsurface	Depth cultural material (mm)	No. artefacts	Materials[5]	Contents	Landform
7721-0602	Hamelyn Heights 4	Artefact Scatter	Surface/ Subsurface	Not Specified	Not specified	Q, S	Flakes	Floodplain/ Terrace
7721-1208	Hamlyn Heights 5	Artefact Scatter	Surface/ Subsurface	0-300	4	Q, S	Flakes	Escarpment
7721-1215	Hamlyn Heights 6	Artefact Scatter	Subsurface	0-300	2	S	Flakes	Escarpment
7721-1209	Hamlyn Heights 7 IA	Artefact Scatter	Subsurface	0-300	1	S	Flake	Floodplain
7721-1359	Hamlyn Heights LDAD 1	LDAD	Surface/ Subsurface	200-300	4	Q, S	Angular fragments	Floodplain
7721-0507	Hume Reserve 1	Artefact Scatter	Surface	-	29	C, F, Q, Qz, S	Flakes, tools	Lowland Plain
7721-1309	Hunt Road 1	Artefact Scatter	Surface/ Subsurface	0-600	1059	B, C, CQ, Q, Qz, S	Flakes	Lower Slope
7721-1310	Hunt Road 2	Artefact Scatter	Surface/ Subsurface	0-200	241	B, C, CQ, Q, Qz,	Flakes, flake fragments, cores, blades, angular fragments	Hill/Crest
7721-1311	Hunt Road 3	Artefact Scatter	Subsurface	0-500	14	Q, S	Flakes, retouched flakes, manuports	Lower Slope
7721-1361	Hunt Road 4	Artefact Scatter	Surface	-	27	Q, Qz, S, Other	Flakes, cores, angular fragments	Escarpment/ Alluvial Terrace
7721-1328	King Billy and King Jerry's Grave	Aboriginal Historical Place	-	-		-	Seven Aboriginal people (Wathaurung) buried within Geelong Cemetery c. 1860s-1880s.	Low Rise
7721-1306	McCurdy Road 1	Artefact Scatter	Subsurface	0-500	62	Q, S	Flakes, cores, angular fragments	Plain
7721-1307	McCurdy Road 2	Artefact Scatter	Surface/ Subsurface	0-200	22	Q, Qz, S	Flakes, retouched flakes, blades, cores, angular fragments	Plain
7721-1308	McCurdy Road 3	Artefact Scatter	Surface/ Subsurface	0-400	32	Q, Qz	Flakes, cores, blades, angular fragments	Plain
7721-0680	Midland Hwy 1	Artefact Scatter	Surface	-	1	S	Flake	Plain
7721-0131	Moorabool River 6	Artefact Scatter	Subsurface	Not specified	1	Qz	Flake	Floodplain

VAHR No.	Place Name	Place Type	Surface/ subsurface	Depth cultural material (mm)	No. artefacts	Materials[5]	Contents	Landform
7721-0809	Northstate I.P 1	Artefact Scatter	Surface	-	1	S	Flake	Plain
7721-0408	Osborne House 1	Artefact Scatter	Not Specified	Not Specified	4	Q, S	Flake	Hill Slope
7721-0451	Podbury Crescent 1	Artefact Scatter	Not Specified	Not Specified	2	Not Specified	Not Specified	Undulating Plain
7721-0774	Prestige Park 5	Artefact Scatter	Surface	-	1	S	Flake	Plain
7721-1387	Rippleside Park LDAD 1	LDAD	Subsurface	0-200	1	S	Flake	Flatland/Bay
7721-0450	Swinburne St 1	Artefact Scatter	Subsurface	0-100	1	S	Flake	Flatland/ Bay
7721-1397	Unprovenanced Carlton hotel 2 LDAD	LDAD	Surface/ Subsurface	0-300	10	Q, Qz, S	Flakes, cores, blades	Plain
7721-1370	Unprovenanced Kacey Boulevard LDAD	LDAD	Surface	-	21	Q, Qz, S	Flakes, angular fragments, blades	Floodplain
7221-0831	Waymouth Street	Artefact Scatter	Surface	-	6	Q, S	Flakes	Monocline
7721-0594	Western Bypass 15	Artefact Scatter	Not Specified	Not Specified	1-4	Q, S	Flakes	Gully/ Channel
7721-0595	Western Bypass 16	Artefact Scatter	Not Specified	Not Specified	5-10	Q, Qz, S	Flakes	Hills/ Ridges
7721-0596	Western Bypass 17	Artefact Scatter	Not Specified	Not Specified	1-4	S	Flakes	Hills/ Ridges
7721-0597	Western Bypass 18	Artefact Scatter	Surface/ Subsurface	Not Specified	102	Q, Qz, S	Flakes, flaked pieces, cores, scrapers, blades, hammerstone	Escarpment
7721-0598	Western Bypass 19	Artefact Scatter	Surface/ Subsurface	Not Specified	51	B, Q, Qz, S	Flakes, cores, scrapers, blades	Escarpment
7721-0636	Western Bypass 24	Artefact Scatter	Surface	-	18	C, F, Q, S	Flakes, angular fragments, scrapers	Escarpment/ Plain
7721-0637	Western Bypass 25	Artefact Scatter	Surface	-	58	Q, RQ, S	Flakes, scrapers, angular fragments	Escarpment

VAHR No.	Place Name	Place Type	Surface/ subsurface	Depth cultural material (mm)	No. artefacts	Materials[5]	Contents	Landform
7721-0638	Western Bypass 26	Artefact Scatter	Subsurface	0-50	5	Q, S	Flakes, blade, cobble	Escarpment/ Plain
7721-0639	Western Bypass 27	Artefact Scatter	Surface/ Subsurface	Not Specified	300+	Not Specified	Not Specified	Escarpment/ Plain
7721-0640	Western Bypass 28	Artefact Scatter	Surface	-	1	Q	Flake	Escarpment
7721-0765	Western Bypass 29	Artefact Scatter	Surface/ Subsurface	Not Specified	1	Q	Flake	Escarpment
7721-0766	Westerm Bypass 30	Artefact Scatter	Surface/ Subsurface	0-500	2	Q, S	Flake	Terrace

The following key points emerge from a review of the registered Aboriginal cultural heritage places identified within the geographic region:

- The majority of registered places are located in proximity to waterways including the Moorabool River, and to a lesser extent, Cowies Creek.
- Places containing stone artefacts, artefact scatters and low-density artefact distributions (LDADs) (91% total), are the most frequent site type within the geographic region.
- A significant proportion of sites were identified as part of complex assessment or excavation, with 27 (42%) sites containing subsurface artefacts.
- 21 places (33%) were identified during archaeological surveys or CHMP standard assessments and contain only surface artefacts.
- Of the artefact scatters and LDADs which record the number of artefacts, 26 (45%) contain 10 or fewer artefacts, and on this basis all of these registered places should be considered as LDADs.
- The remaining artefact scatters contain assemblages that range from 11 to over 1,000 artefacts. VAHR 7721-1359 (Hamlyn Heights LDAD 1) is an extensive artefact scatter located along the lower slope of the Moorabool River approximately 3.5 km south-west of the proposed activity area.
- Quartz, quartzite, and silcrete are the dominant raw materials across the geographic region. Basalt, chert, flint, greenstone, sandstone, siltstone, and rose quartz also appear sporadically in the regional assemblage.
- Stone artefact types found across the region include flakes, angular fragments, flake fragments and blades. Formal tool types including scrapers, hammerstones, and axes also occur in small numbers.
- The maximum depth of subsurface artefacts recovered from within the geographic region is 1,100 mm on a plain landform approximately 3.9 km west of the activity area.
- Two post-contact era Aboriginal Historical Places (VAHR 7721-0563 – Geelong Aboriginal Protectorate Station and 7721-1328 – King Billy and King Jerry's Grave) are present within the geographic region. They comprise 3% of the total places in the geographic region.
- Other place types within the geographic region include shell middens (5%).

7.1.6. Intangible Cultural Heritage

Recent amendments to the *Aboriginal Heritage Act 2006* (Vic) acknowledge the significance of intangible cultural heritage for Victoria's Aboriginal people. Intangible heritage refers to the practices, expressions, knowledge and skills that communities recognise as part of their cultural heritage. It is communicated from generation to generation and is constantly recreated by communities in response to their environment and their history. It provides communities and individuals with a sense of identity and continuity.

In Victoria, Aboriginal intangible heritage includes (First Peoples – State Relations 2021):

- Ceremony
- Creation Stories
- Skills involved in the creation of cultural items
- Knowledge and skills associated with medicinal plant use
- Language

- Dance
- Song
- A great variety of other cultural expressions and cultural knowledge systems.

A request for information relating to intangible cultural heritage values and oral histories associated with the activity area was made to the Elders and Traditional Owners of WTOAC on 17 January 2022. WTOAC did not respond with any information regarding oral histories or intangible heritage values that they wished to provide for this CHMP.

7.1.7. Previous Studies Relevant to the Activity Area

7.1.7.1. Regional Studies

Aboriginal Archaeological Investigations in the Barwon Drainage Basin

The Barwon Drainage Basin Archaeological Project (Richards and Jordan 1999) was undertaken by Aboriginal Affairs Victoria in 1995, aimed at describing the nature and condition of the Aboriginal archaeological record of the Barwon River basin, and where appropriate, to develop predictive models of site distribution and density. Whilst the study focussed on the Barwon drainage basin as a whole, the Bellarine Peninsula study area, which extends from the City of Geelong 30 km eastwards into Port Phillip Bay and Bass Strait, is most relevant to the current activity area. The Bellarine Peninsula study area covers two major geomorphic units: the South Victorian Coastal Plains and the Western Victorian Volcanic Plains.

Richards and Jordan (1999) reviewed archaeological investigations across the Bellarine Peninsula, noting many issues with legacy data and inconsistencies in recording archaeological sites over time. They also note the prolific collection of Aboriginal artefacts in the region since the time of European settlement, particularly in regard to stone axes and grinding stones. Surface artefact scatters were found to be the most common site type on the peninsula, followed by shell middens, exposures of cultural material in banks, scarred trees, human burials, individual artefacts and hearth features.

Due to the issues noted above with archaeological survey data, Richards and Jordan (1999) were unable to produce a detailed predictive model of site distribution and density for the study area, although they did suggest an estimated site density of 16.75 sites/km² for coastal area, which may be even higher given that the Bellarine Peninsula would have been a focus of occupation for past Aboriginal people.

Channel Deepening Existing Conditions Report Aboriginal Heritage

Rhodes (2003) prepared an existing conditions report relating to Aboriginal cultural heritage on the Port Phillip coastline and assessed the potential for submerged Pleistocene and early Holocene archaeological sites within the bay. The report was commissioned in response to the proposed deepening of shipping channels used to access the Port of Melbourne and aimed to identify Aboriginal heritage issues which may be impacted by the proposed channel deepening.

The report included both desktop assessment and consultation with Traditional Owner groups for five sampling units, including the Geelong Foreshore. The Geelong Foreshore was found to be largely lacking in previous archaeological investigation and contained only one registered fish trap and an Aboriginal historic place, likely due to the development of the coastline since European settlement. For the entire project study area, the majority of archaeological sites on the bay were assessed as being in deteriorated

or poor condition, and coastal and non-coastal erosion was identified as being the main threat to archaeological sites.

Port Phillip Aboriginal Heritage Strategic Desktop Assessment

A strategic desktop assessment of the Port Phillip foreshore was commissioned by the Department of Sustainability and Environment to provide an overview of registered Aboriginal cultural heritage places, areas of assessed archaeological sensitivity and known areas of cultural sensitivity to Traditional Owners (Wheeler et al. 2011). The report aimed to assess the likely impact of sea level rises and increased foreshore erosion on Aboriginal places and areas of archaeological and/or cultural sensitivity within an area of 1 km inland from the current bay shoreline. The report provides recommendations for assessment and management options to assist in future project planning.

The impact modelling identified 60 sites likely to be affected over the next century, including:

- 20 sites that have been identified as submerged or in close proximity to the current sea level
- 27 additional sites that may be impacted by sea level rise alone by 2100
- 17 additional sites that may be impacted by sea level rise and storm surges by 2100.

They include the following site types:

- 31 artefact scatters
- 25 shell deposits
- 3 multiple component sites comprising shell deposit and artefact scatter
- 1 human remains site
- 1 multiple component site comprising of human remains
- 2 stone features
- 1 unidentified site.

A further 17 sites were identified as having the potential to be impacted by flooding during extreme weather events, such as storm surges.

7.1.7.2. Cultural Heritage Management Plans

The activity area has not previously been subject to CHMP assessment. A total of 21 CHMP investigations have been completed within the geographic region and are listed on ACHRIS:

- Three CHMPs were undertaken to desktop assessment level, eight to standard assessment level and 10 to complex assessment level.
- Areas of archaeological potential identified during CHMP investigations include locations along the coastline which have been subject to lesser degrees of disturbance and along waterways.
- CHMPs within the geographic region that are relevant to this project are discussed in detail below and summarised in Table 6.

7.1.7.3. Cultural Heritage Management Plans Prepared in Proximity to the Activity Area

CHMP 15893 Proposed Power Supply Upgrade at Rippleside Park, Rippleside

Young and Barker (2018) prepared a mandatory CHMP on behalf of the City of Greater Geelong for the proposed construction of a power supply upgrade at Rippleside Park. The activity area for CHMP 15893

was located immediately south of the current activity area, on the opposite side of Liverpool Street within Rippleside Park. The desktop assessment did not identify any previously registered Aboriginal cultural heritage places within the activity area, likely due to its land-use history as a former landfill. The results of the desktop assessment did however conclude that it was possible for Aboriginal cultural heritage (most likely artefact scatters or LDADs) to be present in disturbed subsurface contexts.

Ground surface visibility was poor during the standard assessment (<1%) and no Aboriginal cultural heritage material was identified on the ground surface. The extent of significant ground disturbance was unable to be determined during the survey, and so a complex assessment was proposed. The complex assessment comprised the excavation of two 1 x 1 m stratigraphic test pits and 12 50 x 50 cm shovel test pits. Aboriginal cultural heritage in the form of a single silcrete distal flake (VAHR 7721-1387) was identified within disturbed subsurface contexts between 100-200 mm in depth. The artefact was deemed not to be *in situ* since it was found within imported fill containing glass, metal and plastic. Soils across the entirety of the activity area were considered to be imported fill and no natural soils were identified.

CHMP 17153: Education Centre, 39 Bay Street, Rippleside, Victoria

Green and Burch (2020) prepared a mandatory CHMP to allow for the use of an existing building as an education centre, approximately 450 m north of the current activity area. The results of the desktop assessment indicated that the activity area was unlikely to contain any Aboriginal cultural heritage places, due to its long history of development and disturbance from a range of works including the construction of the original building in 1847, land reclamation during the mid-20th century, and subsequent landscaping and the construction of driveways. No further archaeological investigation was deemed to be required.

Table 6: Summary of CHMP investigations near the activity area

CHMP No. (Reference)	Areas of Cultural Heritage Sensitivity	Expected Aboriginal Place Types	Area Excavated During Assessment	Aboriginal Places Identified	Landform	Depth of Test Pits
CHMP 15893 (Young and Baker 2018)	Coastal land	None (Disturbance)	18 m²	VAHR 7721-1387	Engineered coast	200 mm
CHMP 17035 (Ayres *et al*. 2020)	Aboriginal cultural heritage places Waterway Coastal land	Shell Middens	3 m²	VAHR 7721-0620	Coastal plain, engineered coast	190-580 mm
CHMP 11168 (Clark & Kiddell 2010)	Waterway	None (Disturbance)	Desktop Only	n/a	Modified coastal plain	n/a
CHMP 17153 (Green & Burch 2020)	Coastal land	None (Disturbance)	Desktop Only	n/a	Coastal plain	n/a
CHMP 16974 (Waldie 2020)	Aboriginal cultural heritage places Waterways	LDADs, Artefact Scatters	Survey Only	n/a	Plain	n/a
CHMP 13480 (Macmanus *et al.* 2015)	Park	Artefact scatters	Survey Only	n/a	Plain, coastal plain	n/a
CHMP 13952 (Bullers & MacManus 2016)	Coastal land	None (Disturbance)	Survey Only	n/a	Headland	n/a
CHMP 14129 (O'Connor & Kennedy 2016)	Park	Artefact scatters	Survey Only	n/a	Plain, coastal plain	n/a
CHMP 16654 (Gilchrist *et. al.* 2019)	Aboriginal cultural heritage places Waterway	LDADs, Artefact Scatters	Survey Only	VAHR 7721-1412	Plain, coastal plain	n/a
CHMP 15221 (Stone 2017)	Coastal crown land	None (Disturbance)	Survey Only	n/a	Engineered coast	n/a

CHMP 17035: Proposed Spirit of Tasmania Redevelopment at Geelong Port's Corio Quay, Corio Quay Road, North Geelong, Victoria

Ayres et al. (2020) prepared a mandatory CHMP for the proposed redevelopment of the Spirit of Tasmania Geelong Port at Corio Quay approximately 2 km north of the current activity area.

The desktop assessment identified one previously registered Aboriginal cultural heritage place, a shell midden (VAHR 7721-0620), located within the activity area. The activity area comprises an industrial site wholly situated within an engineered coastal landform on introduced fill.

During the standard assessment, much of the activity area was found to be covered by concrete, asphalt or buildings. Ground surface visibility was better near Cowies Creek (60%), where much of the ground was covered by ballast. VAHR 7721-0620 was relocated and inspected during the survey, and no further areas of archaeological potential were identified due to the extent of the disturbance that had occurred across the activity area.

The complex assessment involved the excavation of three 1x1 m stratigraphic test pits north of Cowies Creek within the extent of VAHR 7721-0620, in an area deemed to have been less disturbed by underground utilities. The stratigraphic profile of the test pits was found to contain a sandy fill and confirmed that the landform was entirely constructed. It was therefore suggested that VAHR 7721-0620 does not represent an Aboriginal cultural place, and instead is a historically modified fill deposit rather than a shell midden. A review of the site card of VAHR 7721-0620 does not yet indicate that the place registration has been listed as a 'non-site'.

CHMP 13952: Malteurop Geelong Expansion Project, 32 Crowle Street, North Geelong, Victoria

Bullers and MacManus (2016) prepared a mandatory CHMP for the proposed expansion of a production facility located on the coast approximately 2 km north of the current activity area. The activity area was approximately 4.1 ha in size and was located on a coastal headland landform.

The desktop assessment did not identify any previously registered Aboriginal cultural heritage places within the activity area. Geotechnical testing undertaken between 1995 and 2015 showed that topsoils have been completely stripped from the activity area to remove contaminated soils prior to the construction of existing plant. The conclusions of the desktop assessment highlighted that it was unlikely that any Aboriginal places occur within the activity area due to the amount of prior disturbance that has occurred across the site. The findings of the standard assessment confirmed that the entirety of the activity area had been subject to extensive ground disturbance and that no original topsoil remained. No Aboriginal cultural heritage or potential for Aboriginal cultural heritage was identified within the activity area as a result of the CHMP assessments.

CHMP 16654: Ford Motor Company Industrial Subdivision: 455 Melbourne Road, North Geelong

Gilchrist et al. (2019) prepared a mandatory CHMP for an industrial subdivision of the Ford manufacturing plant adjacent to Corio Quay, approximately 2 km north of the current activity area. The desktop assessment identified one previously registered Aboriginal cultural heritage place located on a modified coastal plain landform within the activity area. VAHR 7721-0609 is an isolated quartzite scraper uncovered beneath a carpark during drainage excavation works. The assessment identified the potential for Aboriginal cultural heritage to occur within the area, although in disturbed contexts due to the operation of the Ford manufacturing complex since 1925.

The standard assessment was undertaken over one day, with ground surface visibility varying between 1-100%. A total of 13 stone artefacts were identified on the surface of the banks of an artificial storm water lagoon constructed using imported fill. The artefacts were registered as an LDAD (VAHR 7721-1412). The previously registered place, VAHR 7721-0609, was inspected and no cultural material was identified at the registered coordinate. A total of nine auger holes were also excavated during the standard assessment to investigate subsurface soil profiles. A high level of disturbance was evident across the activity area, and alluvial soils were found to have been removed, most likely during remediation works of Cowies Creek in the mid-1900s. A complex assessment was not required due to extensive historical land modification, the presence of underground services and above-ground infrastructure, and since VAHR 7721-0906 and 7721-1412 were not to be impacted by the proposed works.

CHMP 16974: Proposed Warehouse Development at 309-341 Melbourne Rd North Geelong

Waldie (2020) prepared a mandatory CHMP for the proposed development of a warehouse approximately 2 km north-west of the current activity area. The activity area of CHMP 16974 was situated within a 'plains with low rises' landform. The results of the desktop assessment identified one previously registered Aboriginal cultural heritage place, an isolated artefact (VAHR 7721-0540) located within the activity area. An investigation of the land use history determined that *in situ* Aboriginal cultural heritage material was unlikely to occur due to the presence of introduced fill materials across the site. Furthermore, geotechnical and soil testing studies found no natural sediment to exist overlying the natural sterile basal clay layer.

A standard assessment was undertaken which confirmed a high level of disturbance across the activity area resulting from the construction of an existing warehouse and carpark. An attempt was made to identify VAHR 7721-0540, but it was unable to be relocated. No Aboriginal cultural heritage was identified during the ground survey.

CHMP 13480: Shared Path, Eastern Park, East Geelong, Victoria

MacManus et al. (2015) prepared a mandatory CHMP for the construction of a proposed shared pedestrian and cycling path, approximately 1.5 km in length, at Eastern Park, East Geelong. The activity area of CHMP 13480 was located approximately 3 km south-east of the current activity area. The desktop assessment did not identify any Aboriginal cultural heritage places within the activity area. Eastern Park has been reduced in size since it was first put aside for use in 1851, and disturbance to the park has included the construction of buildings, pathways, playing fields and tennis courts, as well as landscaping.

The standard assessment was undertaken over one day, with moderate ground surface visibility (46%) observed across the activity area. No Aboriginal cultural heritage or areas of archaeological potential were identified during the standard assessment. Due to the degree of ground disturbance seen across the activity area, the existence of Aboriginal cultural heritage within the proposed alignment was deemed to be highly unlikely and a complex assessment was not required.

CHMP 14129: Shared Path: Amended Alignment, Eastern Park, East Geelong, Victoria

O'Connor and Kennedy (2016) prepared a further CHMP for proposed construction of a shared path in Eastern Park, East Geelong, to cover a 250 m amendment to the original path alignment. As with CHMP

13480 (MacManus 2015), the desktop assessment did not identify any Aboriginal cultural heritage places within the activity area.

The standard assessment was undertaken over one day and low to moderate ground surface visibility (20-40%) was observed across the activity area. No Aboriginal cultural heritage was identified within the activity area during the ground survey.

CHMP 15221: Geelong Botanic Gardens Building and Sewer Main Extension, Geelong East

Stone (2017) prepared a mandatory CHMP for the construction of a visitor facility and sewer main extension in the Geelong Botanic Gardens approximately 3 km south-east of the current activity area. The desktop assessment did not identify any registered Aboriginal cultural heritage places within the activity area which is located within an engineered coastal landform.

A one-day standard assessment was undertaken and poor ground surface visibility (<5%) was observed across the activity area. No Aboriginal cultural heritage was located during the survey, and modifications caused by past development, including the expansion of the Botanic Gardens and the development of Eastern Park, were observed as having contributed to the significant disturbance of the activity area. A complex assessment was deemed not to be required.

CHMP 11168: Cowies Creek Sewerage Pump Station, North Geelong

Clark and Kiddell (2010) prepared a mandatory CHMP for the proposed upgrade of the Cowies Creek sewerage pump station on behalf of Barwon Water. The activity area was situated on a heavily modified floodplain and located approximately 2 km north-west of the current activity area. The desktop assessment did not identify any Aboriginal cultural heritage places within the activity area and found that significant amounts of fill had been imported and dumped during the use of the site as a landfill. Standard and complex assessments were not undertaken due to contaminated fill and asbestos being identified across the site to a depth of at least 3 m during geotechnical investigations.

7.1.8. Historical and Ethnohistorical Accounts of Aboriginal Occupation

In this section the available ethnohistorical and historical information relating to Aboriginal people in the geographic region is briefly reviewed. This information will assist in formulating a model of Aboriginal subsistence and occupation patterns across the region. In conjunction with an analysis of the documented archaeological record of the region, the ethnohistorical information assists in the interpretation of archaeological sites in the wider area, and in predicting the potential location of archaeological site types within the activity area.

Aboriginal peoples' occupation of the geographic region extends over thousands of years. This occupation would have taken the form of temporary camps used on a seasonal basis. The landscape was undoubtedly well known to generations of people, and it is probable that associations extended to spiritual attachments.

The lives of Aboriginal groups in the greater Geelong area were severely disrupted by the establishment and expansion of European settlement. As a result, only limited information is available regarding the pre-contact lifestyle of Aboriginal people within the geographic region.

There are several problems concerned with correctly identifying and describing nineteenth century Aboriginal groups within the geographic region. This is largely a result of discrepancies in early European

accounts and the difficulties early settlers had in understanding Aboriginal languages and social systems. Furthermore, the devastating effects on Aboriginal people of European presence which resulted in the loss of traditional lands and resources, the spread of disease, social breakdown and the removal of groups and individuals to reserves and mission stations has compounded the difficulties associated with accurately recounting an early ethnohistory of the Aboriginal people of the region (Barwick 1984: 13).

7.1.8.1. Social Organisation

At the time of European colonisation, central and north-eastern Victoria was occupied by a collection of peoples known as the *Kulin*, who shared certain cultural, social and language characteristics (Barwick 1998: 13, 28). The *Kulin* were in turn divided by distinctive language variations and organisational attributes, resulting in the definition of individual groups by contemporary observers as 'clans' or 'tribes'. Today they are more consistently defined by ethnohistorians as groups linked by commonalities of language, or 'language groups'. In contemporary Aboriginal society in the wider Melbourne region, the terms 'tribe', 'people' or 'nation' are more commonly used by Aboriginal people to demonstrate a traditional identity or allegiance beyond the strictly academic term 'language group'.

The *Kulin* Nation consisted of five language groups (*Woi Wurrung, Bun wurrung, Wadawurrung, Djadja wurrung,* and *Daung wurrung*) who had varying degrees of shared vocabulary and close mutual economic and social relationships (Barwick 1984). Each tribe consisted of independent groups of closely related kin, or 'clans', who were spiritually linked to designated areas of land through their association with topographic features connected to mythic beings or deities. Clan lands were inalienable, and clan members had religious responsibilities to ensure 'the perpetuation of species associated with the particular mythic beings associated with that territory' (Berndt 1982: 4). Unfortunately, there is no available information at this level of study regarding mythic associations with landscape features within the activity area.

According to Clark (1990), the activity area is located within the traditional lands of the *Wadawurrung* language group (spelling according to Clark 1990: 364). *Wadawurrung* territory extended along the coast from Painkalac Creek at Aireys Inlet, east into Port Phillip Bay to the Werribee River and extended north as far as Fiery and Mt Emu Creeks. At the time of European settlement, Clark (1990, p.307) records that there were approximately 27 *Wadawurrung* clans, with the *Wadawurrung balu*g clan who occupied the Barrabool Hills south-west of Geelong and the area south to the Surf Coast (Clark 1990) being the most geographically relevant to the activity area. Clans practiced a patrilineal kinship system that was organised into moieties belonging to either *Waa* (crow) or *Bunjil* (eaglehawk). Marriage partners were required to belong to different moieties (Clark 1990: 276-7), with the *Wadawurrung balug* clan being of the *Bunjil* moiety. The head of the clan was known as either Nourenit/Narenit or Arweet (Clark 1990, p.277).

7.1.8.2. Lifestyle, Environment and Resources

There is comparatively little documented information regarding *Wadawurrung* use of resources in the geographic region. The landscape surrounding the activity area would have formed a strategic base for Aboriginal people to exploit coastal and riverine resources. Aboriginal groups tended to remain small for their day-to-day activities and while travelling, only coming together in large groups for particular ceremonies or to exploit abundant seasonal food resources.

Prior to European settlement the geographic region would have contained a great number and variety of floral and faunal species associated with the rivers, creeks and floodplains and coastal regions of the area. The coast and major waterways would have been the focus of hunting and gathering and the source of a range of edible fish, shellfish, water and sea birds, yabbies and eels. Of these foods, eels were perhaps the greatest source of protein and were able to be caught in large numbers using stone weirs and long fibre nets or baskets. Fish and stingrays were speared in shallow waters, and crabs and crayfish were caught using nets.

Across the geographic region, some of the food resources that may have been utilised by Aboriginal people include wetland root crops such as *Typha* and *Triglochin*, dry land root crops such as *Microseris lanceolata* (*murnong* or yam-daisy), as well as coastal plants such as banksias, wattles and pigface. Land mammal species once commonplace throughout the region would have included possum, native rats, bettong, wallaby, kangaroo and bandicoot.

A large variety of plants were not only valued for their potential food resources, but also for their medicinal uses and their suitability for the manufacture of implements. Ephemeral swamp plants such as bull rushes and sedges were also an important source of food, as well as fibre for woven bags and decorative items. She-oaks and coastal tee tree were utilised for their timber and bark.

7.1.8.3. Post-contact History

The development of Geelong township and surrounding pastoral settlement resulted in the loss of traditional lands and resources, the spread of disease, social breakdown and removal of both groups and individuals to reserves and mission stations. The *Wadawurrung* clans who lived on the coast were the first to come into direct contact with European people. This occurred by at least 1802 '…when Lieut. John Murray in the Lady Nelson, charted part of Indented Head and named Swan Bay' (Clark 1990: 277). The clan that occupied the areas around Geelong, the *Wadawurrung balug*, was probably the next to have direct contact with the white explorers, which continued between 1802 and 1835.

The introduction of agriculture, grazing and land clearing brought about environmental changes that affected the availability of traditional food supplies and other necessary resources for the *Wadawurrung* clans. After a few years, many Aboriginal people were starving and forced to rely on government rations administered by the Aboriginal Protector, or handouts from local settlers. Sheep and cattle were sometimes stolen or hunted for food, and a series of murders on both sides resulted (Barwick 1984; Presland 1983). By the end of 1836, sheep runs spread round Geelong within a semicircle of 40 km radius.

In 1839, an Aboriginal Protectorate Scheme was established, which appointed local stations to provide rations, homes and medical care to Aboriginal people. As part of this scheme, Wesleyan Mission Station and Buntingdale Station were established within the area with the aim of encouraging local *Wadawurrung* clans to move to established reserves and stations. Buntingdale Mission was located on the traditional boundary between the *Wadawurrung* and the neighbouring *Gulidjan* clan which caused a number of fights between members who frequented the mission (Presland 2010: 107-109; Clark 1990: 222-223).

Census information from the early 1840s is sparse with information relating to *Wadawurrung* clans (Clark 1990: 307). Corris (1968; cited in Clarke 1990) believes '…(that) there is so little known about the social organisation of the *Wadawurrung* bespeaks the rapidity with which they were physically

destroyed by settlers seeking undisputed possession of their land' (Clark 1990: 277). Data compiled by Police Magistrate Foster Fyans in 1837 claimed that all the Aboriginal people within 30 miles (48 km) of Geelong amounted to 297 men, women and children (Clark 1990). By 1858, Fyans considered that no more than 20 of these 297 people remained alive.

The Central Board for the Protection of the Aborigines was founded in 1861 resulting in a number of missions and stations being established. Three reserves (Steiglitz, Kargun and Mt. Duneed), and two missions (Framlingham and Coranderrk) were established within a 200 km radius of Geelong by the end of 1861 for the *Wadawurrung* clans (Clark 1990: 300).

7.1.9. Land Use History

The landscape of the Geelong coast has undergone significant modification since the time of European settlement. The activity area once formed part of the coastline itself, and a beach was formerly present along Harbourside Drive before land reclamation works occurred during the late 1950s. Historical aerial imagery from the mid-1920s shows the low sloping coastal land and sandy beach of the activity area, compared to the steeper cliffs to the north and south (

Figure **14** and Figure 15).

The activity area is the location of the former Rippleside Port Complex, which was established in 1905 and expanded over time to include a slipway, ship workshops and a pier. The port originally consisted of a simple wooden jetty which extended from the coast immediately west of the activity area, as shown in

Figure **14** and Figure 15. By 1921, construction works by the Geelong Harbour Trust had expanded the port to include additional workshops and a slipway for ship repairs (Victorian Heritage Database 2021). Historical aerial imagery from 1947 shows the state of the port complex and the coastline at that time (Figure 16 and Figure 17).

In 1959, an area along the coastline of the activity area covering approximately 2 ha was reclaimed to construct new shipyards, maintenance workshops and a larger slipway closer to the ocean. As part of these works, a significant amount of fill was brought into the upper elevations of the land along Balmoral Crescent, and below to construct the modern-day ground surface which extends into the sea. Evidence of this imported fill can be seen in the soil profile of bore hole BH01 located on the northern boundary of the activity area (Figure 18), which was undertaken during geotechnical investigations for the project (Douglas Partners 2019). The soil profile of bore hole BH01 (presented in full in Appendix C) contains an imported gravelly sandy fill extending to a depth of 1.25 m from the current ground surface. Furthermore, the coastal landscape of the activity area, which when photographed in the mid-late 1920s was low and sloping (

Figure **14** and Figure 15), has since been filled to level it to the same height as the modern surrounding landscape.

To construct the new Rippleside Port Complex, almost the entirety of the activity area was excavated out to a depth to of approximately 10 m below the original ground surface leaving a narrow strip of land and steep batters along the northern and western (Balmoral Crescent) margins of the activity area. The batters are reasonably steep, varying from 30° to 35° on the western batter and up to approximately

41° on the northern batter. It is likely that all excavated soil from the activity area was put towards the land reclamation works for the port complex. An historical aerial image from 1966 shows the extent of the land reclamation works and the excavation of the activity area (Figure 19).

Figure 14: Historical aerial imagery of activity area facing north c.1925-1930 (Pratt, C.D., via Trove)

Figure 15: Historical aerial imagery of activity area facing south c.1927 (Pratt, C.D., via Trove)

Figure 16: Historical aerial image of activity area dating to 1947 (Landdata 2021)

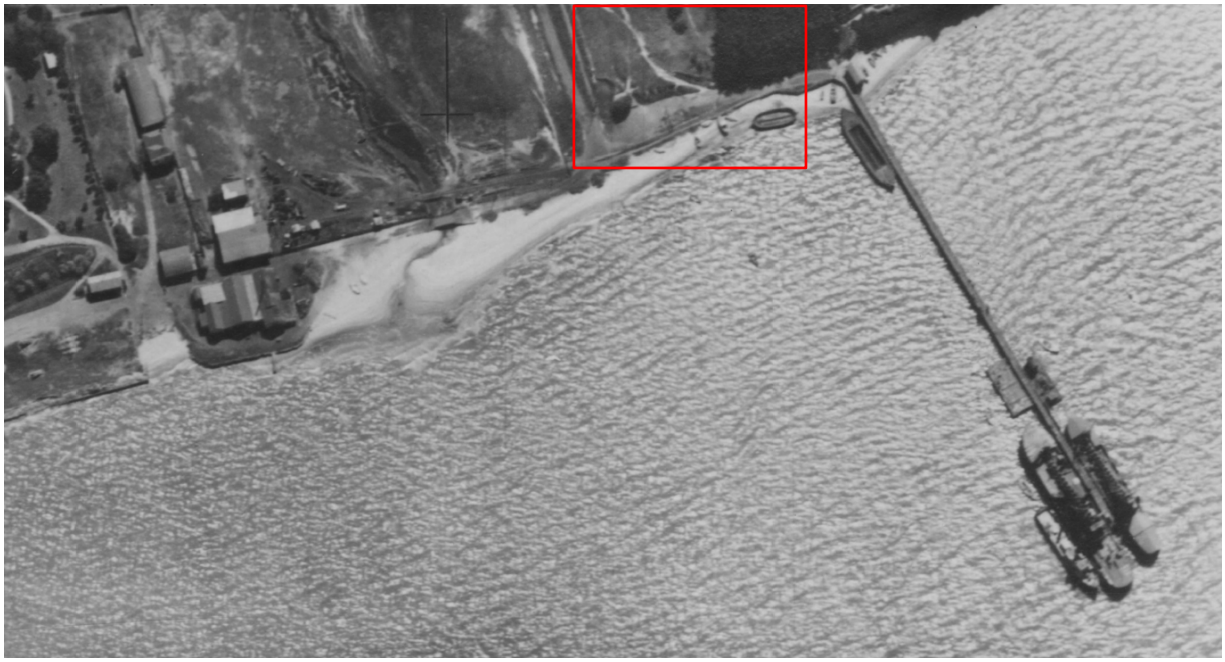

Figure 17: Historical aerial imagery c.1947 showing activity area coastline (Landdata 2021)

Figure 18: Location of geotechnical borehole, in adjacent property near NW corner of the activity area (Douglas Partners 2019, view SW)

Figure 19: Historical aerial image of activity area dating to 1966 (Landdata 2021)

The purpose of the excavation of the activity area was to create an open area for buildings and workshops on the same level as the reclaimed land. Within the activity area itself, the ground surface was asphalted, and workshops and outbuildings were constructed on top. Additional works also occurred at this time, including the extension of Liverpool Street along the southern boundary of the activity area to access the port complex, and landscaping to plant tea trees on the southern and western boundaries (Figure 19). It is also likely that an historical sewer main was installed within the activity area running along the base of the northern batter, as shown on Barwon Water diagrams from 1970 (Figure 20). Google Earth imagery of the activity area from 2008 is shown in Figure 21.

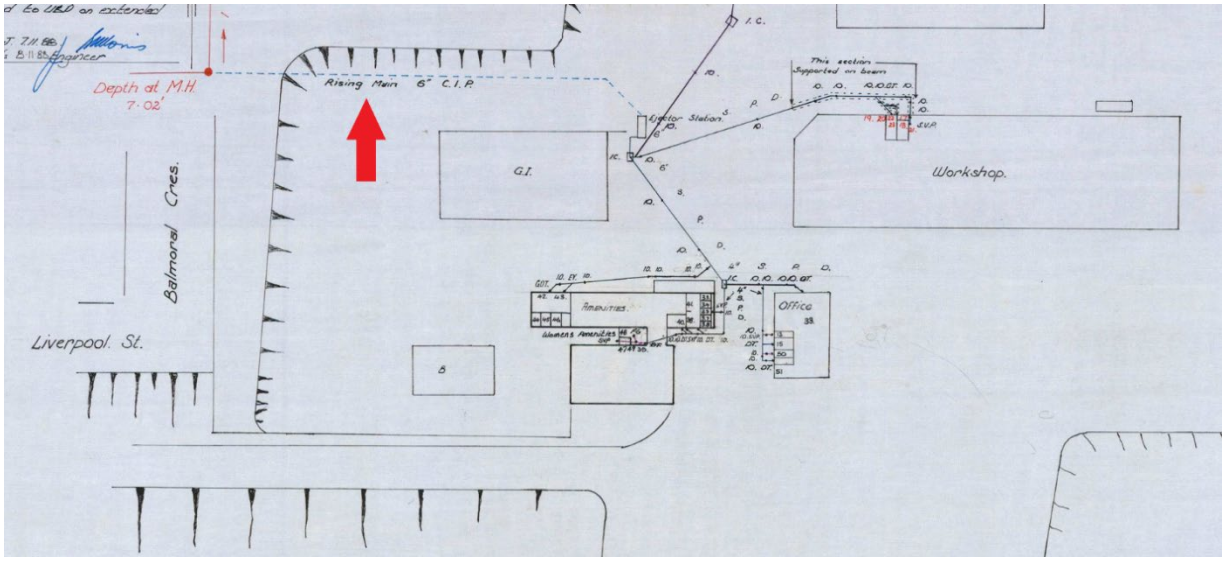

Figure 20: 1970 Barwon Water planning showing location of a 6" rising main sewer pipe at base of northern batter within activity area (via Douglas Partners 2019)

The Rippleside Port Complex existed in this form until 2015 when the workshops were demolished. Since then, Barwon Water has constructed a pumping station located in the north-eastern corner of the activity area. Further subsurface utility installation has occurred along the margins of the activity area on Liverpool Street to the south and Balmoral Crescent to the west. In addition to the pumping station, a new sewer line and manholes were installed at the crest of the western batter on Balmoral Crescent around 2017. The activity area also contains a range of subsurface utilities as indicated during a Dial Before You Dig search (0).

The geotechnical report also contains photographs of the current condition of the site, which are shown in Figure 22 and Figure 23. The report also concludes that much of the northern batter is unstable in its current state (as shown in Figure 24 and Figure 25).

Figure 21: 2008 Google Earth imagery of activity area and Rippleside Port Complex

Figure 22: Current condition of activity area, facing south (Douglas Partners 2019)

Figure 23: Current condition of activity area, facing south-west, showing western batter (Douglas Partners 2019)

Figure 24: Northern batter, facing north showing instability as marked in geotechnical study (Douglas Partners 2019)

Figure 25: Northern batter, facing north east showing instability as marked in geotechnical study (Douglas Partners 2019)

7.1.10. Summary

By comparing the results of the background research and the archaeological investigations previously undertaken within the geographic region, the following conclusions can be drawn regarding the nature of Aboriginal archaeological material within the activity area:

- Ethnographic observations indicate that the activity area is located within the traditional lands of the *Wadawurrung* language group. The clan associated with the activity area is the *Wadawurrung balug.*
- The activity area is situated within subunit 8.7 (Engineered Coast – Port Melbourne) of the Coast geomorphological unit and is therefore located within a former coastline landform.
- The activity area is mapped as being located within the Victorian Volcanic Plain bioregion and is underlain by Black Rock Sandstone and Gellibrand Marl. Geotechnical testing within the activity area found that the Moorabool Viaduct Sands and the Fyansford Formation geological units were encountered during bore hole drilling.
- A total of 60 registered Aboriginal cultural heritage places are located within the geographic region, which is defined as an irregular polygon ranging approximately 3 km to the north and south of the activity area, capturing the land between the Moorabool River in the west and the coastline in the east.
- Place registrations containing stone artefacts (artefact scatters and LDADs) make up the majority of these places (90%). Shell middens and Aboriginal Historical Places also represented within the geographic region.
- A review of these Aboriginal cultural heritage place indicates specific clustering along the waterways within the geographic region, including Moorabool River and Cowies Creek, as well as the coastline.

- No previously registered Aboriginal cultural heritage places are located within the activity area.
- One previously registered Aboriginal cultural heritage place is located within 200 m of the activity area boundary: VAHR 7721-1387.
    - VAHR 7721-1387 is an LDAD recorded in 2018 as part of CHMP 15893 (Young and Barker 2018), comprising a single silcrete distal flaked stone artefact. The artefact was identified within imported fill at a depth of 100-200 mm.
- The activity area is located on a landscape that has been utilised for maritime industry since 1905. The activity area has been excavated out in almost its entirety to enable the construction of the Rippleside Port Complex and land reclamation activities. Further impacts have included the installation of subsurface utilities and a pumping station.

The results of the desktop assessment indicate that places containing stone artefacts (artefact scatters and LDADs) are the most common place type within the geographic region, particularly along waterways. Shell middens are also present along the coastline within the geographic region. The desktop assessment therefore determined that there was a potential for stone artefacts and shell midden material to have been present within the activity area prior to European contact, given the presence of the coastal landform and beach. However, the likelihood of unrecorded Aboriginal cultural heritage material being present within the activity area is now low, due to the long-term use of the activity area for maritime industry, and extensive ground disturbance associated with the construction of the Rippleside Port Complex that has removed over 95% of all deposits dating to the period of Aboriginal occupation of the activity area. It is possible, however, that Aboriginal cultural heritage may be present in disturbed contexts within the activity area.

The findings of the desktop assessment indicate that it is possible (although unlikely) for Aboriginal cultural heritage to be present within the activity area, which resulted in the requirement that the CHMP progress to a standard assessment as per Regulation 62(1).

7.2. Standard Assessment

7.2.1. Introduction

The Aboriginal cultural heritage standard assessment of the activity area was prepared pursuant to regulation 63 of the Regulations and in accordance with proper archaeological practice as outlined in Burke and Smith (2004: 65-69).

The aims of the standard assessment were to:

- Inspect areas with ground surface visibility for Aboriginal archaeological sites within the activity area.
- Undertake a general assessment of the overall archaeological potential of the activity area.

The ground survey conducted as part of the standard assessment was carried out on 22 February 2022. Participants in the ground survey are listed in Table 7.

Table 7: Participants in the standard assessment ground survey

Participant	Organisation	Role	Date
Caroline Hawker	ELA	Lead archaeologist	22 February 2022
Kaleb Owen	WTOAC	RAP representative	22 February 2022
Shane Saunders	WTOAC	RAP representative	22 February 2022

7.2.2. Obstacles Encountered in Completing the Assessment

The upper embankments of the activity area were not surveyed during the standard assessment of the activity area due to safety issues relating to their instability, and the potential for field participants to fall.

7.2.3. Previously Registered Aboriginal Cultural Heritage Places

At the commencement of the assessment there were no previously registered Aboriginal cultural heritage places located within the activity area.

7.2.4. Method of Assessment

The standard assessment of the activity area involved a ground survey undertaken by means of an opportunistic pedestrian inspection. The activity area was assessed as two separate investigation areas (IAs) (Figure 26), based on observations made during the standard assessment regarding the locations of disturbance across the former coastline landform:

- IA-1: lower ground level
- IA-2: embankments.

Long thick grass, areas of asphalt and gravel, and soil stockpiles resulted in low ground surface visibility across the activity area, and so the survey was undertaken opportunistically until areas of ground surface exposure were identified for systematic pedestrian survey. All identified areas of ground surface exposure within IA-1 were thoroughly examined for the presence of Aboriginal cultural heritage over the course of one day by a team totalling three people spaced approximately 1 m apart. The upper embankments of IA-2 were not surveyed due to safety issues; however, the overgrown embankment walls were inspected for areas of exposure.

7.2.5. Archaeological Potential Rating

As a component of the ground survey and as a means of informing the conduct of the subsequent complex assessment, each IA was assessed in terms of its overall archaeological sensitivity and evidence for disturbance. A rating scheme listed in Table 8, was used to assign both an archaeological sensitivity rating and a disturbance rating to the activity area.

Table 8: Archaeological sensitivity and disturbance rating scheme

Archaeological Sensitivity Rating	Value	Disturbance Rating
Low	1	High
Low-moderate	2	Moderate-high
Moderate	3	Moderate
Moderate-high	4	Low-moderate
High	5	Low

Figure 26: Map of the standard assessment showing the activity area investigation areas

The archaeological sensitivity rating reflects the likely cultural heritage values of the activity area. An initial archaeological sensitivity rating for each IA was assigned based on the outcomes of the desktop assessment. After completion of the standard assessment, the sensitivity rating was then reviewed and, if required, adjusted to properly reflect the observations made during the ground survey.

The disturbance rating reflects the compounded impact of past and present land uses. A disturbance rating for each IA was assigned based on the findings of the desktop assessment and the outcomes of the ground survey. The disturbance rating includes factors such as the extent of landscape modification and disturbance of subsoil deposits by various activities.

The archaeological sensitivity and disturbance rating values were then multiplied together to determine an overall Archaeological Potential Rating (APR) for each IA as outlined in Table 9.

Table 9: Archaeological potential rating scheme

Archaeological Potential Rating	Value
Low	1 to 4
Low-moderate	5 to 7
Moderate	8 to 12
Moderate-high	13 to 17
High	18 to 25

7.2.6. Results

Summary descriptions of the standard assessment ground survey of IA-1 and IA-2 are presented in Table 10 and Table 12 respectively. Maps displaying the ground surface visibility of the activity area are presented in Figure 27; ground disturbance in Figure 28; and archaeological potential rating in Figure 29.

The ground survey also included the examination of all mature indigenous trees within the activity area and checked for the presence of caves and rock shelters in accordance with the requirements of regulation 63(3) of the Regulations. No scarred trees, caves, cave entrances or rock shelters were identified. No previously unregistered Aboriginal cultural heritage material was identified as a result of the standard assessment.

7.2.6.1. IA-1: Lower ground level

IA-1 captures the lower ground level of the activity area and covers a highly modified former coastline landform that has been cut down from the cliff above. Much of IA-1 was covered by long thick grass, areas of asphalt and gravel, and soil stockpiles, necessitating that the survey be undertaken opportunistically until areas of ground surface exposure were identified. All areas of ground surface exposure underwent systematic pedestrian survey.

Large vegetation is entirely absent from the lower ground level of the activity area, with the exception of planted native *Melaleuca*, which form a windbreak along a portion of the southern and western boundary lines. Ground surface visibility across IA-1 during the standard assessment was very low (<1%) and mainly limited to areas along the base of the embankments.

Figure 27: Map of the standard assessment showing the ground surface visibility (GSV) and effective survey coverage (ESC) of the activity area

Figure 28: Map of the standard assessment showing landforms and ground disturbance across the activity area

Figure 29: Map of the standard assessment showing the archaeological potential rating of the activity area

Table 10: Summary description of IA-1

Investigation Area	IA-1
Survey Method	Pedestrian
Sampling Strategy	Opportunistic
Sample Type	Targeting exposures
No. of Participants	3
Transect Width	3 m
Transect Spacing	1 m
Visibility	
Exposures	Confined to areas of grass dieback along base of embankment
% ground cover on exposures	5
% surface visibility on exposure	10
% ground cover off exposures	95
% surface visibility off exposure	0
Average ground surface visibility	0.25 %
Environment	
Setting	Coastal
Land System/Elevation	Lowland (0- <300 m)
Locality Landform	Coast
Slope	Level (<0.5°)
Water	None (adjacent to Corio Bay)
Disturbance	Excavation of landform, building construction and demolition, carpark construction, subsurface utility installation.
Previous/Current Land Use	Former shipyards, construction site
Vegetation	
Vegetation Condition	Exotic/modified native vegetation
Vegetation Type	Urban (grass coverage and native vegetation)
Previously registered VAHR places	No
Unregistered Aboriginal Place Identified?	No
Sensitivity Rating	4: Moderate (prior to disturbance)
Disturbance Rating	1: High

Ground surfaces across the entirety of IA-1 have been cut to a depth of approximately 10 m from the surrounding upper cliff level. The ground surface of the lower ground level is covered by asphalt and gravel surfaces, areas of dumped soil/gravel, and stockpiles (Figure 30 to Figure 33). A gravel hard stand ramp has been constructed to allow vehicle access from Liverpool Street (Figure 34) and subsurface utility installations were also observed (Figure 35). The north-eastern portion of the activity area contains a fenced Barwon Water pump station and an electrical substation (Figure 36 and Figure 37).

This area is entirely covered by asphalt roadway, concrete slabs or gravel and contains above-ground infrastructure and pit covers for subsurface utilities.

Figure 30: Activity area facing north-east (C. Hawker, 22 February 2022)

Figure 31: Asphalt car park, facing north (C. Hawker, 22 February 2022)

Figure 32: Gravel area and soil stockpiling, facing west (C. Hawker, 22 February 2022)

Figure 33: Soil stockpiling, facing south-east (C. Hawker, 22 February 2022)

Figure 34: Gravel hard stand access ramp, facing southwest (C. Hawker, 22 February 2022)

Figure 35: Installed utilities, facing southeast (C. Hawker, 22 February 2022)

Figure 36: Barwon Water pump station area, facing west (C. Hawker, 22 February 2022)

Figure 37: Landscaping on Harbourside Drive adjacent Barwon Water pump station, facing south-west (C. Hawker, 22 February 2022)

Details regarding the calculation of APR for IA-1 are presented in Table 11. IA-1 presents a moderate level of archaeological sensitivity and a high level of disturbance, resulting in a low archaeological potential rating.

Table 11: IA-1 Archaeological potential rating (APR)

Investigation Area	Archaeological Sensitivity Rating	Disturbance Rating	APR
IA-1	4	1	4 – Low

7.2.6.2. IA-2 Embankments

IA-2 captures the embankments remaining within the activity area, which are present along the northern and western property boundaries. The IA also captures a highly modified former coastline landform.

IA-2 was not surveyed during the standard assessment due to safety issues relating to the instability of the embankments, and the potential for the field team to fall from a significant height (Figure 38). The embankments were inspected from the lower ground level but were largely covered by thick weeds and grasses (Figure 39 and Figure 40). A short section of the cut embankment surface was found to be exposed in the north-western corner of the activity area (Figure 41), which was inspected, and a few small shell fragments identified.

Figure 38: Top of embankment, facing south-west (C. Hawker, 22 February 2022)

Figure 39: Western embankment, facing west (C. Hawker, 22 February 2022)

Figure 40: Northern embankment, facing north-west (C. Hawker, 22 February 2022)

Figure 41: Exposed embankment cut, facing west (C. Hawker, 22 February 2022)

Table 12: Summary description of IA-2

Investigation Area	IA-2
Survey Method	Inspection only
Sampling Strategy	Opportunistic
Sample Type	Targeting exposures
No. of Participants	3
Transect Width	N/A
Transect Spacing	N/A
Visibility	
Exposures	N/A
% ground cover on exposures	N/A
% surface visibility on exposure	N/A
% ground cover off exposures	N/A
% surface visibility off exposure	N/A
Average ground surface visibility	N/A
Environment	
Setting	Coastal
Land System/Elevation	Lowland (0- <300 m)
Locality Landform	Coast

Investigation Area	IA-2
Slope	Level (> 0.5o)
Water	None (adjacent to Corio Bay)
Disturbance	Excavation of landform, subsurface utility installation.
Previous/Current Land Use	Construction site
Vegetation	
Vegetation Condition	Exotic/modified native vegetation
Vegetation Type	Urban (grass coverage and native vegetation)
Previously registered VAHR places	No
Unregistered Aboriginal Place Identified?	No
Sensitivity Ratings	4: Moderate (prior to disturbance)
Disturbance Ratings	1: High

Details regarding the calculation of APR for IA-2 are presented in Table 13. IA-2 presents a moderate level of archaeological sensitivity and a high level of disturbance, resulting in a low archaeological potential rating.

Table 13: IA-2 Archaeological potential rating (APR)

Investigation Area	Archaeological Sensitivity Rating	Disturbance Rating	APR
IA-2	4	1	4 – Low

7.2.7. Summary

The results of the standard assessment are summarised as follows:

- Ground surfaces within the activity area were assessed during an archaeological survey program undertaken on 22 November 2022, by one ELA heritage advisor and two WTOAC representatives.
- Two Investigation Areas (IAs) were assessed, defined on the basis of a single highly modified coastline landform, and the differing types of disturbance observed across the activity area.
- Ground surfaces within IA-1 (lower ground level) were largely obscured by asphalt, gravel, stockpiles and grass cover, resulting in very low ground surface visibility (<1%).
- IA-2 (embankments) were not surveyed due to safety concerns and were only opportunistically inspected.
- Observed impacts to the activity area were extensive and included historical excavation and land modification, the construction of an asphalt carpark and gravel hard stand, soil stock piling and the installation of subsurface utilities.
- The Archaeological Potential Ratings (APR) for IA-1 and IA-2 were calculated as being of low archaeological potential for each IA.
- No unregistered Aboriginal cultural heritage places or objects were identified during the standard assessment.

On completion of the standard assessment, the field team moved immediately into a complex assessment program within IA-1 of the activity area. This decision was in keeping with the assessment methodologies required by the WTAOC during a meeting on 2 December 2021 (see Table 3), which included mechanical testing within the lower ground level of the activity area to determine the extent of subsurface disturbance, and an investigation of a shell-bearing soil deposit identified during geotechnical testing.

A complex assessment would therefore enable a proper investigation of the potential for subsurface Aboriginal cultural heritage places to be present, and identify the nature, extent and significance of any Aboriginal cultural heritage found during the assessment in accordance with Regulation 64(1) of the *Aboriginal Heritage Regulations 2018* (Vic).

7.3. Complex Assessment

7.3.1. Introduction

The Aboriginal cultural heritage complex assessment of the activity area was prepared pursuant to regulation 65 and clause 9, Schedule 2 of the Regulations.

The complex assessment was undertaken to best meet the outstanding aims of the desktop and standard assessments, and to further investigate the potential for Aboriginal cultural heritage to be present within the activity area.

The aims of the subsurface testing program were to:

- Establish the subsurface stratigraphy through controlled mechanical excavation.
- Determine the presence or absence of subsurface archaeological deposits and gather more information on the nature of soil deposits.
- Determine the nature and significance of any identified Aboriginal cultural heritage places.

The subsurface testing program undertaken for the complex assessment was completed over a single day on 22 February 2022. Participants in the subsurface testing program are listed in Table 14.

Table 14: Participants in the complex assessment subsurface testing program

Participant	Organisation	Role	Dates
Caroline Hawker	ELA	Lead archaeologist	22 February 2022
Brandon Hocking	ELA	Field assistant	22 February 2022
Kaleb Owen	WTOAC	RAP representative	22 February 2022
Shane Saunders	WTOAC	RAP representative	22 February 2022

The subsurface testing program was supervised by:

- **Caroline Hawker,** Heritage Advisor, Eco Logical Australia
  Bachelor of Archaeology (Honours), La Trobe University, 2018
  Industry experience: three years.

7.3.2. Obstacles Encountered in Completing the Assessment

Compact soil deposits were encountered during excavation which became difficult to excavate using the excavator's mud bucket attachment. Whilst due care was taken to keep test pit walls as straight as possible and to excavate stratigraphically, some cupping of the walls occurred.

7.3.3. Subsurface Testing Strategy

Based on the request of WTOAC during a meeting on 2 December 2021 (Table 3), a subsurface testing program that included the excavation of a single 2x1.2 m mechanical test pit was implemented as the most effective means of investigating the archaeological potential and disturbance of the activity area. The proposed placement of the test pit was submitted to WTOAC for the approval of the Traditional Owners (Table 3), and its location was subsequently refined during fieldwork on the advice of WTOAC representatives.

7.3.4. Excavation Methodologies

A single mechanical test pit (MT 1) measuring 2x1.2 m was excavated stratigraphically in 100 mm spits using an excavator with a mud bucket attachment to a maximum depth of 1.5 m. Excavation ceased at 1.5 m in line with the advice from WTOAC that excavation would not be required beyond this depth (Table 3). All excavated sediments were 100% sieved using a mechanical sieve with a 5 mm mesh. A dumpy level was used to maintain vertical control during excavations based on the establishment of a datum using the highest corner of the trench (Table 15). Munsell colour and soil pH observations were also recorded.

The excavation of the test pit was used as the means for establishing a representative stratigraphic profile for the activity area and to investigate the extent of disturbance. Given the compact nature of the clayey soil deposits, good vertical control over depth was maintained, although some cupping of the test pit walls occurred with depth due to the use of the mud bucket.

Table 15: MT 1 excavation spit levels

MT 1	Corrected Values (Base of Spit)			
Spit	**A (NW)**	**B (NE)**	**C (SE)**	**D (SW)**
Start levels	40	0	10	50
Base of spit 1	130	90	160	190
2	240	260	250	270
3	390	360	350	380
4	410	390	370	410
5	520	490	510	550
6	680	650	660	690
7	730	700	710	740
8	800	790	810	790
9	890	910	890	900
10	1000	970	1000	1020
11	1110	1100	1090	1110
12	1270	1250	1250	1260

MT 1	Corrected Values (Base of Spit)			
13	1310	1310	1330	1340
14	1390	1370	1400	1410
15	1460	1480	1490	1470

7.3.5. Test Pit Coordinates

The geographic coordinate recorded for test pit MT 1 is provided in Table 16. The coordinate was recorded using the Victorian Government Standard (GDA94 Zone 55).

Table 16: Test pit coordinates

Test pit name	Easting	Northing
MT 1	268315.893	5776891.807

7.3.6. Establishing Stratigraphy

In order to determine a stratigraphic profile for the activity area by controlled excavation in compliance with regulation 65(4) of the Regulations, the 2x1.2 m mechanical trench was excavated stratigraphically in 100 mm spits. Mechanical Trench 1 (MT 1) was excavated within a modified coastline landform and was located near the base of the western embankment in an area covered by gravel. The test pit revealed the following stratigraphic profile (Table 17, Figure 42 to Figure 44):

- Context 1 (0-250 mm): A pale brown friable silty gravel fill. Frequent gravel, asphalt fragments, brick fragments and modern rubbish.
- Context 2: (250-1500+ mm): A mottled yellowish-brown firm-compact silty clay. Occasional shell fragments.

No Aboriginal cultural heritage was identified in MT 1.

Table 17: Modified coastline stratigraphic test pit soil profile

Pit name	Context	Starting depth (mm)	Base depth (mm)	Colour	Consistency	Composition	Comments	Munsell	pH
MT 1	1	0	250	Pale brown	Friable	Silty gravel fill	Frequent gravel, asphalt fragments, brick fragments and modern rubbish	10YR 6/3	9.5
	2	250	1500+	Yellowish brown	Firm-compact	Silty clay	Occasional shell fragments	10YR 5/8	10

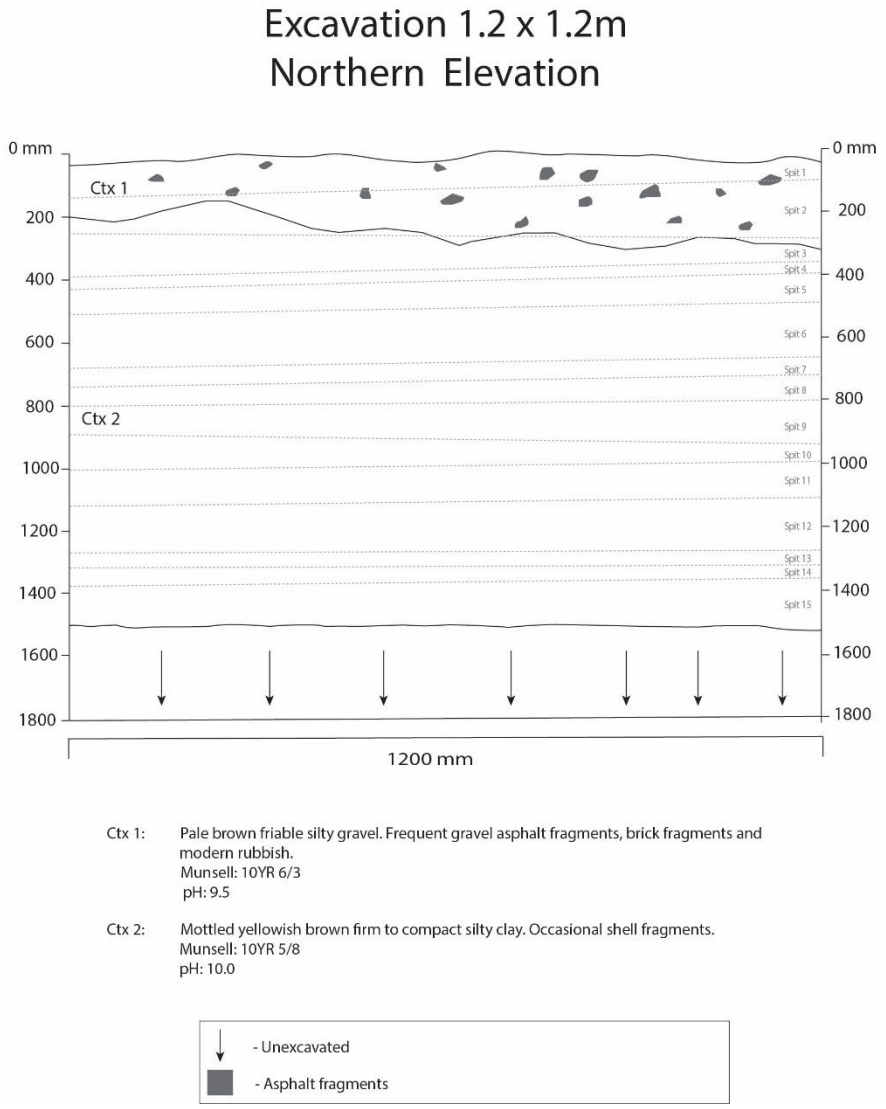

Figure 42: Test pit MT 1 stratigraphic profile

Figure 43: MT 1, base of excavation (spit 15), facing east (C. Hawker 22 February 2022)

Figure 44: MT 1, north section (C. Hawker, 22 February 2022)

7.3.7. Results

A single 2x1.2 m mechanical test pit was excavated over one day within the lower ground level area of IA-1 in accordance with the subsurface testing strategy outlined in Section 7.3.4. Munsell colour and soil pH observations were recorded during the complex assessment, the latter indicating that the soil profile of the site was highly alkaline in nature.

The location of the test pit is mapped in Figure 45. No Aboriginal cultural heritage material was identified during excavation undertaken for the complex assessment.

7.3.7.1. Nature and Character of Soils within the Activity Area

The type, colour and consistency of soils within the activity area were investigated through the excavation of a single 2x1.2 m mechanical test pit, located within the lower ground level portion of the site. The soil profile of the test pit revealed two defined stratigraphic layers. The upper deposit comprised a pale brown friable silty gravel fill identified to depths of between 0-250 mm. This upper deposit contained inclusions of frequent gravel, asphalt fragments, brick fragments and modern rubbish. Underlying the silty gravel was a mottled yellowish-brown firm-compact silty clay that continued through to the base of excavation at 1.5 m. The silty clay increased in compaction with depth and was very clean, containing only occasional shell inclusions.

The heavily truncated soil profile encountered in MT 1 reflects the history of disturbance within the activity area, whereby the former coastline was excavated to a depth of approximately 10 m from the original ground surface for the construction of the former shipyards at the site (see Section 7.1.9 for further details). The upper silty gravel context would have been laid down to form a surface for the rear of the shipyard. The silty clay deposit underlying the gravel context is associated with the Tertiary age Fyansford Formation geological deposit (dating to 10-15 million years old), which according to a geological review of the geotechnical studies conducted for the project, comprises a 'stiff to hard silty clay with fossiliferous layers (described as calcareous fragments) and occasional cemented bands…present beneath the lower parts of the site and extending below sea level' (Wilson 2021).

The soil profile of the lower ground level portion of the activity area is therefore representative of a highly modified former coastline landform dating to more than 10 mya and is extremely unlikely to contain any Aboriginal cultural heritage material, due to the disturbance of the activity area and the age of deposits encountered.

7.3.8. Summary

The results of the complex assessment are summarised as follows:

- A subsurface testing program comprising the excavation of a single 2x1.2 m mechanical test pit was completed over one day on 22 February 2022 within IA-1.
- The soil profile of the heavily modified coastline landform comprised two defined stratigraphic layers:
    - Context 1 (0-250 mm): A pale brown friable silty gravel fill. Frequent gravel, asphalt fragments, brick fragments and modern rubbish.
    - Context 2: (250-1500+ mm): A mottled yellowish-brown firm-compact silty clay. Occasional shell fragments.

Figure 45: Results of the complex assessment excavation program

- The stratigraphy encountered reflects the history of disturbance of the site, whereby ground surfaces were excavated out to a depth of approximately 10 m from their original level for the construction of former shipyards, resulting in a heavily truncated soil profile.
- Context 1 is associated with introduced gravel fill surfaces present within the rear of the former shipyards.
- Context 2 is likely associated with the Tertiary age Fyansford Formation geological deposit, which dates to 10-15 mya.
- No Aboriginal cultural heritage material was identified during the complex assessment excavation program.

Given these results, it was determined that no further subsurface investigation was warranted as part of this CHMP, and that the likelihood of Aboriginal cultural heritage places occurring within the activity area is extremely low.

8. Consideration of Section 61 Matters – Impact Assessment

8.1. Section 61 Matters

In accordance with s 61 of the *Aboriginal Heritage Act 2006* (Vic) (the Act), this section reviews particular matters to be considered in relation to the approval of a CHMP for the activity.

A critical purpose of the CHMP is to assess the potential impact of the proposed activity on Aboriginal cultural heritage and to devise appropriate conditions to avoid or minimise these impacts.

Section 61 of the Act requires that consideration of the following is presented for each Aboriginal cultural heritage place or object found, discovered or subject to investigation in the activity area:

- Whether the activity will be conducted in a way that avoids harm to the Aboriginal place or object.
- If it does not appear to be possible to conduct the activity in a way that avoids harm to the Aboriginal place or object, whether the activity will be conducted in a way that minimises harm to the Aboriginal place or object.
- Any specific measures required for the management of the Aboriginal place or object likely to be affected by the activity, before, during and after the activity.

Based on the outcomes of the desktop, standard and complex assessments presented above, no Aboriginal cultural heritage was identified during the preparation of this CHMP, and there is an extremely low potential for Aboriginal cultural heritage places or objects to be located within the activity area. The following observations are offered in relation to matters referenced under section 61 of the *Aboriginal Heritage Act 2006* (Vic):

- The activity will not harm known Aboriginal cultural heritage as none has been identified within the activity area.
- No Aboriginal cultural heritage was identified within the activity area during the preparation of this CHMP and therefore no place-specific or object-specific management conditions are required before, during or after the activity.
- Contingency plans in relation to disputes, delays and other obstacles that may affect the conduct of the activity are presented in Section 2 of this cultural heritage management plan (CHMP).
- Requirements relating to the custody and management of Aboriginal cultural heritage during the course of the activity are included in Contingency 6: Custody of Cultural Heritage of this CHMP.

8.2. Cumulative Impact Assessment

The desktop, standard and complex assessments presented in this CHMP did not identify any Aboriginal cultural heritage located within the activity area and determined that there is an extremely low potential for undiscovered Aboriginal cultural heritage to be present within the activity area.

As described in the desktop assessment, known Aboriginal cultural heritage places within the geographic region most commonly comprise stone artefacts (including artefact scatters and LDADs), which make up 90% of all registered places. Shell middens and Aboriginal Historical Places are also occasionally

represented within the geographic region. Registered places are most commonly distributed along waterways and along the coastline.

A summary of registered Aboriginal cultural heritage places found along the Geelong coastline closest to the activity area is presented in Table 18. These places are rated as being of between low and moderate significance.

Consideration of potential cumulative impacts to Aboriginal cultural heritage arising from the conduct of the activity in the activity area should include an assessment of impacts to cultural heritage places along the Geelong coastline. Disturbances to the places listed in Table 18 include upgrades to open spaces, including walking paths and power supplies, as well as residential development. These activities will have resulted in impacts to known and unknown Aboriginal cultural deposits along the Geelong coastline. A review of the site cards for these Aboriginal cultural heritage places included on the VAHR indicates that efforts have generally not been made to minimise harm to Aboriginal cultural heritage places, although many older site cards do not record this information.

The proposed activity will not result in further impacts to Aboriginal cultural heritage and therefore will not contribute to cumulative impacts on Aboriginal cultural heritage places within the geographic region.

Table 18: Cumulative impact assessment, VAHR place review

Place No.	Place Name	Place Type	Surface/ subsurface	Landform	Significance Rating	Prior Disturbance	Harm Avoidance	Harm Minimisation	Harm Description
7721-0241	EASTERN PARK (GEELONG) 1	Artefact Scatter	Surface	Hill/ escarpment	Moderate	Unspecified	Unspecified	Unspecified	Unspecified development
7721-0241	EASTERN PARK (GEELONG) 1	Shell Midden	Surface	Hill/ escarpment	Moderate	Unspecified	Unspecified	Unspecified	Unspecified development
7721-0408	OSBORNE HOUSE 1	Artefact Scatter	Surface	Hill slope	Low	Residential construction	Unspecified	Unspecified	Unspecified development
7721-0409	MOORPANYAL PARK MIDDEN	Shell Midden	Surface	Headland	Moderate	Erosion Pedestrian traffic	Unspecified	Unspecified	None
7721-0440	BLOXHAMS BEACH 1	Shell Midden	Surface/ subsurface	Cliff	Moderate	Erosion	Unspecified	Unspecified	Unspecified development
7721-0450	SWINBURNE ST 1	Artefact Scatter	Subsurface	Flat land, bay	Low	Landscaping	Unspecified	Unspecified	Unspecified development
7721-0641	FRANK MOORE RESERVE 1	Artefact Scatter	Surface	Escarpment/ cliff	Low	Pedestrian traffic Water runoff Park mowing	Unspecified	Unspecified	None
7721-0757	CALCUTTA BAY 1	Shell Midden	Subsurface	Shore	Low	Park development	Unspecified	Unspecified	Walking track
7721-0758	CALCUTTA BAY 2	Shell Midden	Subsurface	Beach	Moderate	Park development	Unspecified	Unspecified	Walking track
7721-0759	CALCUTTA BAY 3	Shell Midden	Subsurface	Beach	Low	Park development	Unspecified	Unspecified	Walking track
7721-0760	CALCUTTA BAY 4	Shell Midden	Subsurface	Beach	Moderate	Park development	Unspecified	Unspecified	Walking track
7721-0775	STINGAREE BAY 1	Artefact Scatter	Surface	Coastal floodplain	Low	Pedestrian	Unspecified	Unspecified	Unspecified development

Place No.	Place Name	Place Type	Surface/ subsurface	Landform	Significance Rating	Prior Disturbance	Harm Avoidance	Harm Minimisation	Harm Description
7721-1387	Rippleside Park LDAD1	LDAD	Subsurface	Flat land/ bay	Low	Landfill Parkland	No	No	Utility upgrades
7721-1390	61 The Esplanade Midden	Shell Midden	Subsurface	Headland	Moderate	Residential development	No	No	Residential development

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Appendix A Notice of Intention to Prepare a CHMP

VICTORIA State Government | Premier and Cabinet

Notice of Intent to prepare a Cultural Heritage Management Plan for the purposes of the *Aboriginal Heritage Act 2006*

This form can be used by the Sponsor of a Cultural Heritage Management Plan to complete the notification provisions pursuant to s.54 of the *Aboriginal Heritage Act 2006* (the "Act").

For clarification on any of the following please contact Victorian Aboriginal Heritage Register (VAHR) enquiries on 1800-726-003.

SECTION 1 - Sponsor information

Sponsor:	Balmoral Quay Pty Ltd		
ABN/ACN:	602 240 399		
Contact Name:	Theo Axarlis		
Postal Address	Level 2, 650 Chapel Street SOUTH YARRA VIC 3141		
Business Number:	03 9823 3400	Mobile:	0411 871 733
Email Address:	taxarlis@gersh.com.au		

Sponsor's agent (if relevant)

Company:			
Contact Name:			
Postal Address			
Business Number:		Mobile:	
Email Address:			

SECTION 2 - Description of proposed activity and location

Project Name:	Balmoral Quay Stage 5 Dwellings Development, Harbourside Drive, Rippleside
Municipal district:	Greater Geelong City Council

Clearly identify the proposed activity for which the cultural heritage managment plan is to be prepared (ie. Mining, road construction, housing subivision)

Dwellings (3+)

SECTION 3 - Cultural Heritage Advisor

Name	Company	Email address
Caroline Hawker	Eco Logical Australia	caroline.hawker@ecoaus.com.au

SECTION 4 - Expected start and finish date for the cultural heritage management plan

Start Date:	12-Oct-2021	Finish Date:	31-Jan-2022

Submitted on: 11 Oct 2021

VICTORIA State Government | Premier and Cabinet

SECTION 5 - Why are you preparing this cultural heritage management plan?

☑ A cultural heritage management plan is required by the Aboriginal Heritage Regulations 2007

What is the high Impact Activity as it is listed in the regulations?

Is any part of the activity an area of cultural heritage sensitivity, as listed in the regulations? 1

☐ Other Reasons (Voluntary)

☐ An Environment Effects Statement is required

☐ A Cultural Heritage Management Plan is required by the Minister for Aboriginal Affairs.

☐ An Impact Management Plan or Comprehensive Impact Statement is required for the activity

SECTION 6 - List the relevant registered Aboriginal parties (if any)

This section is to be completed where there are registered Aboriginal parties in relation to the management plan.

WADAWURRUNG Traditional Owners Aboriginal Corporation Registered Aboriginal Party

SECTION 7A - List the relevant Aboriginal groups or Aboriginal people with whom the Sponsor intends to consult (if any)

*This section is to be completed only if the proposed activity in the management plan is to be carried out in an area where there is **no Registered Aboriginal Party.***

SECTION 7B - Describe the intended consultation process (if any)

*This section is to be completed only if the proposed activity in the management plan is to be carried out in an area where there is **no Registered Aboriginal Party.***

SECTION 8 – State who will be evaluating this plan (mandatory)

The plan is to be evaluated by:

☐ Joint - Registered Aboriginal Party AND The Secretary

☑ A Registered Aboriginal Party

If checked, list the relevant Registered Aboriginal Party Evaluating:

☐ The Secretary

☐ Victorian Aboriginal Heritage Council

SECTION 9 – Preliminary Aboriginal Heritage Tests (PAHTs)

List the Reference Number(s) of any PAHTs conducted in relation to the proposed activity:

SECTION 10 - Notification checklist

Submitted on: 11 Oct 2021

Premier and Cabinet

Ensure that any relevant registered Aboriginal party/ies is also notified. A copy of this notice with a map attached may be used for this purpose.
(A registered Aboriginal party is allowed up to 14 days to provide a written response to a notification specifying whether or not it intends to evaluate the management plan.)

In addition to notifying the Deputy Director and any relevant registerd Aboriginal party/ies, a Sponsor must also notify any owner and/or occupier of any land within the area to which the management plan relates. A copy of this notice with a map attached may be used for this purpose.

Ensure any municipal council, whose municipal district includes an area to which the cultural heritage management plan relates, is also notified. A copy of this notice, with a map attached, may also be used for this purpose.

Submitted on: 11 Oct 2021

Appendix B RAP Notice of Intention to Evaluate a CHMP

Wadawurrung
Traditional Owners
Aboriginal Corporation

October 12, 2021

Balmoral Quay Pty Ltd
[redacted]

To Whom It May Concern,

RE: NOTICE OF INTENT TO PREPARE A CULTURAL HERITAGE MANAGEMENT PLAN

I am writing to acknowledge your written notice of intention to prepare a management plan, received on the October 11, 2021 for the proposed works for Balmoral Quay Stage 5 Dwellings Development, Harbourside Drive, Rippleside (CHMP #18376).

Wadawurrung Traditional Owners Aboriginal Corporation (WTOAC) is the Registered Aboriginal Party (RAP) for the proposed activity area and:

1. Pursuant to s.55(2) of the *Aboriginal Heritage Act* 2006 give notice that they elect to evaluate the plan when it is completed.
2. Pursuant to s.60 of the *Aboriginal Heritage Act* 2006 give notice that they will do the following-
   (a) Consult with the sponsor in relation to the assessment of the area for the purposes of the plan;
   (b) Consult with the sponsor in relation to the conditions to be included in the plan; and
   (c) Participate in the conduct of the assessment.

To commence consultation for the CHMP, please book in a Project Establishment meeting at rap@wadawurrung.org.au. This meeting will include a discussion of the activity including any design plans and proposed impacts; a detailed discussion of the activity area including size, salient features, geology/geomorphology, and land use history; details of the geographic region being used in the ACHRIS search; details of any sites and relevant CHMPs that may contribute to prediction models for Aboriginal cultural heritage in the Activity area; and details of the next phase of assessment being proposed. All relevant images including maps, plans and photographs should be provided at least 2 business days prior to your meeting, however 7 days prior is preferrable. The desktop assessment will be needed to be provided in full.

Fieldwork can be tentatively scheduled prior to the Project Establishment meeting, however, is not to occur prior to the meeting being completed. Please note that the RAP will not be held responsible for scheduled fieldwork timeframes being different to that required to complete the agreed assessment. Further meetings may be requested during the course of the fieldwork, in order to inform assessment requirements.

Follow up meeting(s) will be required post completion of fieldwork in order to establish that the assessment methodology has been completed as agreed; to discuss Section 61 requirements to avoid harm to Aboriginal Cultural Heritage, and, if not possible, measures to minimise harm to Aboriginal Cultural Heritage; and to determine applicable conditions for the CHMP.

Yours sincerely,

[redacted] [redacted]

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Appendix C City of Greater Geelong Planning Scheme – Zone CDZ2 – Permitted Uses

GREATER GEELONG PLANNING SCHEME

07/12/2020
C396ggee

SCHEDULE 2 TO CLAUSE 37.02 COMPREHENSIVE DEVELOPMENT ZONE

Shown on the planning scheme map as **CDZ2**.

RIPPLESIDE COMPREHENSIVE DEVELOPMENT PLAN

Land

This Clause applies to land generally bounded by Liverpool Street, Balmoral Crescent, Victoria Street and Corio Bay, Rippleside as defined by the Rippleside Comprehensive Development Plan.

Purpose

To facilitate the use, development and design of an urban environment that complements and enhances the area and provides linkages with the surrounding residential, community and open space networks.

To provide for residential, recreational and boating facilities and activities in conjunction with small-scale commercial and tourism development.

To provide for the integrated subdivision and redevelopment of the Rippleside Shipyards generally in accordance with the Rippleside Comprehensive Development Plan.

To provide for development that is sympathetic to the surrounding residential and recreational environment, utilising the waterfront location and harbour infrastructure.

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Table of uses

Section 1 - Permit not required

Use	Condition
Dwelling **Residential building**	Must be generally in accordance with the Rippleside Comprehensive Development Plan. The total number of dwellings cannot exceed 98.
Food and drink premises (excluding Hotel)	Must not exceed two in number. The combined floor area available to patrons is not to exceed 200sqm. Must be within the Commercial area as shown on the Rippleside Comprehensive Development Plan.
Office	Total area must not exceed 1000sqm and must be generally in accordance with the Rippleside Comprehensive Development Plan.
Convenience shop	Must be located generally in accordance with the Rippleside Comprehensive Development Plan.
Home based business	
Shop	Must only be for the sale or hire of marine related goods and services. Gross leasable floor area must not exceed 140 sqm. Must be within the Commercial Zone as shown on the Rippleside Comprehensive Development Plan.
Any use listed in Clause 62.01	Must meet the requirements of Clause 62.01

GREATER GEELONG PLANNING SCHEME

Section 2 - Permit required

Use	Condition
Any use not listed in Section 1 or Section 3	

Section 3 - Prohibited

Use
Adult sex product shop
Agriculture
Brothel
Hotel
Light industry (other than directly associated with the construction, repair and maintenance of boats).
Warehouse
Major sports and recreation facility
Place of assembly
Service station
Shop (other than specified in Section 1)

2.0 Use of land

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None specified.

3.0 Subdivision

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A permit is required to subdivide land. Any subdivision must be generally in accordance with the Rippleside Comprehensive Development Plan.

A subdivision application must be referred to a referral authority listed in Clause 66.

Applications must meet the following requirements:

- Each lot must be provided with a reticulated supply of water and effluent disposal.
- Each lot must be provided with a reticulated supply of electricity located underground unless special and unusual circumstances exist.
- Each lot must have access to a road constructed to the satisfaction of the responsible authority in accordance with its engineering guidelines.

Subdivision may be undertaken in stages to the satisfaction of the responsible authority. The subdivision of the land is conditional upon the owner entering into an agreement with the responsible authority and any other relevant statutory authority pursuant to Section 173 of the Act which agreement shall contain the following covenants:

That the owner at its own cost shall:

- Provide road, drainage or other infrastructure to the land as may be required by the responsible authority and any other statutory authority.
- Provide a pedestrian link at least 10 metres in width to link Rippleside and St Helens Park. Such pedestrian link shall be provided either:
  - wholly within the owner's land along the eastern boundary;
  - partly within the owner's land and partly within Corio Bay;
  - wholly within Corio Bay immediately abutting the site; and
  - must be completed to the satisfaction of the responsible authority prior to the issue of a Statement of Compliance for the subdivision or any stage of the subdivision.

Such agreement shall be prepared at the cost of the owner.

4.0 Buildings and works

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A permit is required to construct a building or to construct or carry out work. All buildings and works must be generally in accordance with the Rippleside Comprehensive Development Plan and Rippleside Urban Design Guidelines to the satisfaction of the responsible authority.

The construction or carrying out of buildings and works is conditional upon the owner of the land entering into an agreement with the responsible authority and any other relevant statutory authority pursuant to Section 173 of the Act which agreement shall contain the following covenants:

That the owner at its own cost shall:

- Provide road, drainage or other infrastructure to the land as may be required by the responsible authority and other relevant statutory authority;
- Provide a pedestrian link at least 10 metres in width to link Rippleside and St Helens Park. Such pedestrian link be provided either:
  - wholly within the owner's land along the eastern boundary;
  - partly within the owner's land and partly within Corio Bay;
  - wholly within Corio Bay immediately abutting the site.

Such agreement shall be prepared at the cost of the owner.

Works may be undertaken in stages to the satisfaction of the responsible authority.

Site History

Prior to the commencement of any demolition works, a site interpretation proposal must be prepared to the satisfaction of the responsible authority. This interpretation proposal must make reference to the history of the site as the Geelong Harbour Trust's Rippleside Workshops.

All existing structures and buildings must be recorded through the preparation of an archival quality photographic record together with the collation of original architecture and engineering drawings where available to the satisfaction of the responsible authority. Such documents must be lodged with the Geelong Historical Records Centre.

The existing entrance gates must be incorporated into the redevelopment of the site.

Urban Design Guidelines

The construction of any building or the carrying out of any works or the subdivision of the land must be undertaken in accordance with the Rippleside Urban Design Guidelines incorporated into this Planning Scheme.

GREATER GEELONG PLANNING SCHEME

Height Control

Except with a permit, the height of any building must not exceed the height above the Australian Height Datum for any particular site as shown on the Rippleside Comprehensive Development Plan incorporated into this Planning Scheme.

Pedestrian Waterside Link

A permit accompanied by detailed plans for the design and construction of the pedestrian link satisfactory to the Department of Natural Resources and Environment must be issued by the responsible authority prior to construction of any buildings or works on the site.

The proponent/developer of the land must enter into an agreement with the responsible authority pursuant to Section 173 of the Act in which appropriate covenants for the provision and maintenance of the pedestrian waterside link, referred to in Clause 3.0 and Clause 4.0 will be contained. The covenants must require the pedestrian foreshore link to be designated as a reserve with a minimum width of 10 metres, incorporating a pedestrian and bicycle path.

A staging plan for the detailed design and construction of the pedestrian waterside link must be submitted to and approved by the responsible authority, before the construction of any buildings or works on the site.

All stages of the construction of the pedestrian waterside link must be completed to the satisfaction of the responsible authority in accordance with the approved staging plan.

Environmental and Site Works

Prior to the commencement of the construction of a building or the construction or the carrying out of works, an environmental management plan must be prepared to the satisfaction of the responsible authority. The environment management plan must contain appropriate provisions for the environmental management of the development of the land to the satisfaction of the responsible authority, including:

- Management of land disturbance;
- Storage, minimisation, handling and disposal of waste, dangerous substances and industrial infrastructure on the land;
- Noise and dust management;
- Landscaping and planting proposals; and
- Contingency and emergency response plan.

All buildings and works must be carried out in accordance with the environmental management plan to the satisfaction of the responsible authority.

Prior to the commencement of works to the escarpment on the land, a detailed geological survey must be undertaken to the satisfaction of the responsible authority, which identifies methods of protecting the escarpment or any areas of geological vulnerability.

Any rock revetment must be built to the satisfaction of the responsible authority, and maintenance agreements must be entered into to address the ongoing maintenance of the rock wall, including sea grasses.

The responsible authority must not issue a planning permit for buildings and works unless it is satisfied that:

- Any necessary sub-ground infrastructure works, contamination clean-up works and geological assessments; and
- Any necessary hard stand and building infrastructure removal,

will or has been carried out to its satisfaction.

GREATER GEELONG PLANNING SCHEME

Information to be provided

An application for a planning permit for the use, to construct a building or to carry out works or subdivide the land must be accompanied by the following information, as appropriate:

- A plan drawn to scale which shows;
  - the boundaries and dimensions of the site.
  - adjoining roads.
  - the location, height and purpose of buildings and works on adjoining land.
  - relevant ground levels.
  - the layout of existing and proposed uses.
  - all driveway, carparking and loading areas.
  - proposed landscape areas.
  - all external storage and waste treatment areas.
  - areas not required for immediate use.
- Scaled elevation drawings to identify the colour and materials of all buildings and works.
- Construction details of all drainage works, driveways, vehicle parking and loading areas.
- A landscape layout which includes the description of vegetation to be planted, its source, the surfaces to be constructed, site works specification and method of preparing, draining, watering, maintaining and monitoring the landscape areas.
- A written submission detailing how and to what extent the proposed buildings and works meet the requirements of the Siting and Design Guidelines for Structures on the Victorian Coast 1998 and the Rippleside Urban Design Guidelines incorporated into this Planning Scheme.
- Evidence that the proposed development complies with Clauses 54 and 55.
- An engineering report assessing the stability of the cliff face and providing evidence or solutions to ensure its ongoing stability. These recommendations must be incorporated into the buildings and works undertaken on the land.
- A detailed traffic plan and accompanying report must be submitted to the satisfaction of the responsible authority. The plan must show as appropriate:
- the location and number of spaces to be provided for each respective component of the proposed development;
- the proposed traffic management and control works considered necessary in adjoining and nearby roads when the development or any stage is completed.
- means of ingress and egress from the site and internal circulation details.
- proposed road surfaces and design measures to be employed to ensure that vehicular roads are shared with pedestrians and do not dominate the village environment.
- the ability for various uses within the site, eg. office and commercial to be able to share car spaces.

Guidelines for consideration

Before deciding on an application for permit, the responsible authority must consider, as appropriate:

- the purposes of the zone;
- the views of the Department Of Natural Resources And Environment;
- the views on the traffic plan by Vicroads;

- the views of Barwon Water;
- the ability of the proposal to achieve the Rippleside Comprehensive Development Plan;
- the consistency of the proposal with the Rippleside Urban Design Guidelines;
- the consistency of the proposal with the Siting And Design Guidelines For Structures Along The Victorian Coast;
- the stability of the cliff face and whether the development and works being undertaken endanger the ongoing stability of the cliff;
- the ability of the proposal to provide satisfactory pedestrian access links to adjoining parks and foreshore areas;
- the provision of acceptable design of public areas including use of street furniture, lighting and landscaping;
- whether sufficient information is provided in the traffic plan and accompanying report to adequately deal with all on and off-site traffic related issues including;
- the location of any proposed off-street parking area;
- points of access to and from the land and whether they are suitably located;
- the layout of the car parking areas within the site and access arrangements to them;
- the impact of traffic generated by the proposal and whether it is likely to require special management and control works in the neighbourhood; and
- the provision of adequate loading facilities;
- whether satisfactory arrangements for the treatment and disposal of stormwater drainage to a legal point of discharge have been made;
- whether there are acceptable arrangements to be put in place for the maintenance and upkeep of all public access areas;
- whether the development is consistent with Clauses 54 and 55.
- that the entering into all necessary agreements with service authorities has been appropriately arranged.

Incorporated Documents

The Rippleside Comprehensive Development Plan February 2000 and the Rippleside Urban Design Guidelines June 2000 are documents incorporated into this Planning Scheme.

Lapsing of Schedule

This schedule shall lapse if the development of the site has not commenced in accordance with any permit issued for such development by 30 January 2013.

5.0 Signs

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C396ggee

None specified.

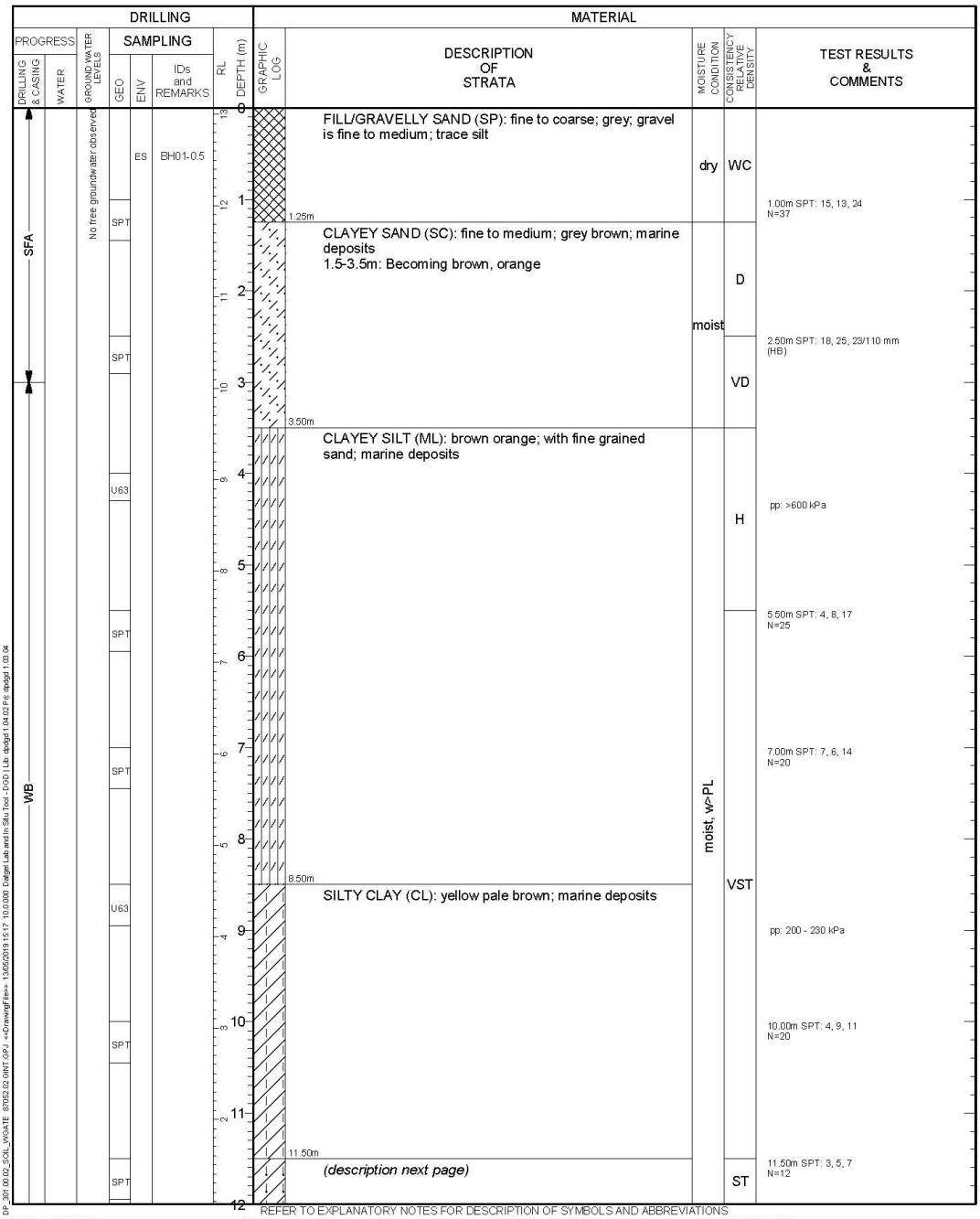
Appendix D Results of Geotechnical Testing

BOREHOLE LOG

CLIENT: Balmoral Quay Pty Ltd
PROJECT: Balmoral Quay - Stage 5
LOCATION: Balmoral Quay, Rippleside

SURFACE LEVEL: 13.1 m
EASTING: 268319.02
NORTHING: 5776932.32
DIP/AZIMUTH: 90°/--

BORE No: BH 101
PROJECT NO: 87052.02
DATE: 1/4/2019
SHEET: 1 of 2



RIG: DB 520 **DRILLER:** Urban Drilling **LOGGED:** AP/MS **CHECKED:** AR

REMARKS: Co-ordinates and surface levels recorded with Altus NR3 dGPS unit **GRID DATUM:** WGS 84 UTM Zone 55

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
B	Bulk sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	▷	Water seep	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▼	Water level	SPT	Standard penetration test
E	Envirmental Sample	PID	Photo ionisation detector (ppm)	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Balmoral Quay Pty Ltd
PROJECT: Balmoral Quay - Stage 5
LOCATION: Balmoral Quay, Rippleside

SURFACE LEVEL: 13.1 m
EASTING: 268319.02
NORTHING: 5776932.32
DIP/AZIMUTH: 90°/--

BORE No: BH 101
PROJECT NO: 87052.02
DATE: 1/4/2019
SHEET: 2 of 2

DRILLING PROGRESS: DRILLING & CASING	DRILLING PROGRESS: WATER	GROUNDWATER LEVELS	SAMPLING: GEO	SAMPLING: ENV	SAMPLING: IDs and REMARKS	RL	DEPTH (m)	GRAPHIC LOG	DESCRIPTION OF STRATA	MOISTURE CONDITION	CONSISTENCY / RELATIVE DENSITY	TEST RESULTS & COMMENTS
WB			SPT			13	0		SILTY CLAY (CH): yellow pale brown; trace of calcareous fragments; with shell fragments from 11.5 m to 13.0 m; marine deposits *(continued)*	moist, w>PL	ST	
											H	13.00m SPT: 5, 13, 22 N=35
			SPT			14	-1		14.5-14.95m: Trace of fine sand below 14.5 m		ST	14.50m SPT: 5, 5, 10 N=15
									14.95m			
						15	-2		Bore discontinued at 14.95m depth Limit of investigation target depth reached			
						16	-3					
						17	-4					
						18	-5					
						19	-6					
						20	-7					
						21	-8					
						22	-9					
						23	-10					
						24						

REFER TO EXPLANATORY NOTES FOR DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

RIG: DB 520 **DRILLER:** Urban Drilling **LOGGED:** AP/MS **CHECKED:** AR

REMARKS: Co-ordinates and surface levels recorded with Altus NR3 dGPS unit **GRID DATUM:** WGS 84 UTM Zone 55

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
B	Bulk sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	▷	Water seep	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▼	Water level	SPT	Standard penetration test
E	Enviromental Sample	PID	Photo ionisation detector (ppm)	V	Shear vane (kPa)

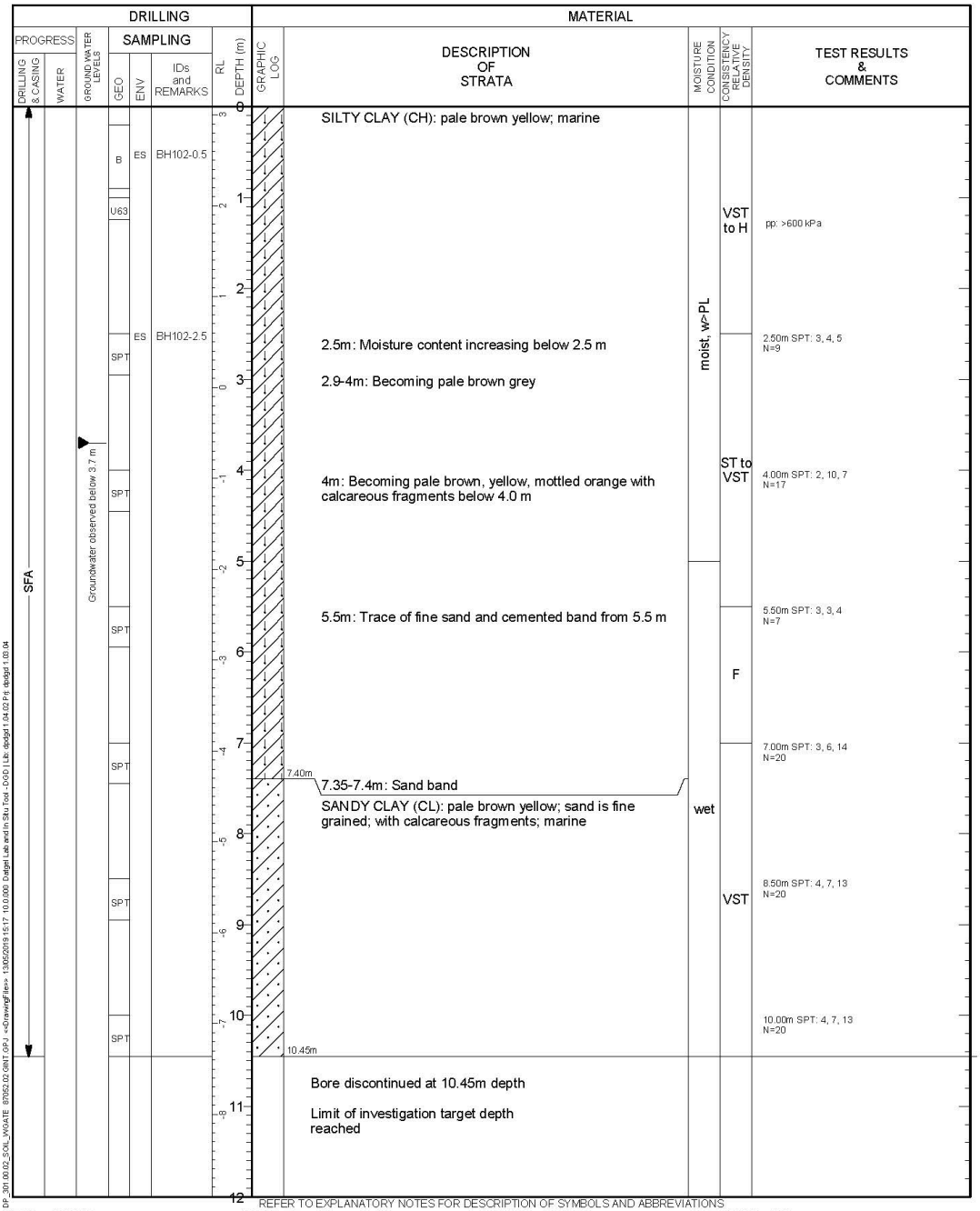
DPDGD 1.04 LIB:SHOWWELL.GLB Log: BP_JIH 00.00.02_SOIL_WQATE 87052.02.GINT.GPJ <<DrawingFiles>> 13/05/2019 15:17 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: dpdgd 1.04.02 Fit: dpdgd 1.03.04

BOREHOLE LOG

CLIENT: Balmoral Quay Pty Ltd
PROJECT: Balmoral Quay - Stage 5
LOCATION: Balmoral Quay, Rippleside

SURFACE LEVEL: 3.1 m
EASTING: 268318.21
NORTHING: 5776907.57
DIP/AZIMUTH: 90°/--

BORE No: BH 102
PROJECT NO: 87052.02
DATE: 1/4 - 2/4/2019
SHEET: 1 of 1



REFER TO EXPLANATORY NOTES FOR DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

RIG: DB520 **DRILLER:** Urban Drilling **LOGGED:** AP/MS **CHECKED:** AR

REMARKS: Co-ordinates and surface levels recorded with Altus NR3 dGPS unit **GRID DATUM:** WGS 84 UTM Zone 55

SAMPLING & IN SITU TESTING LEGEND

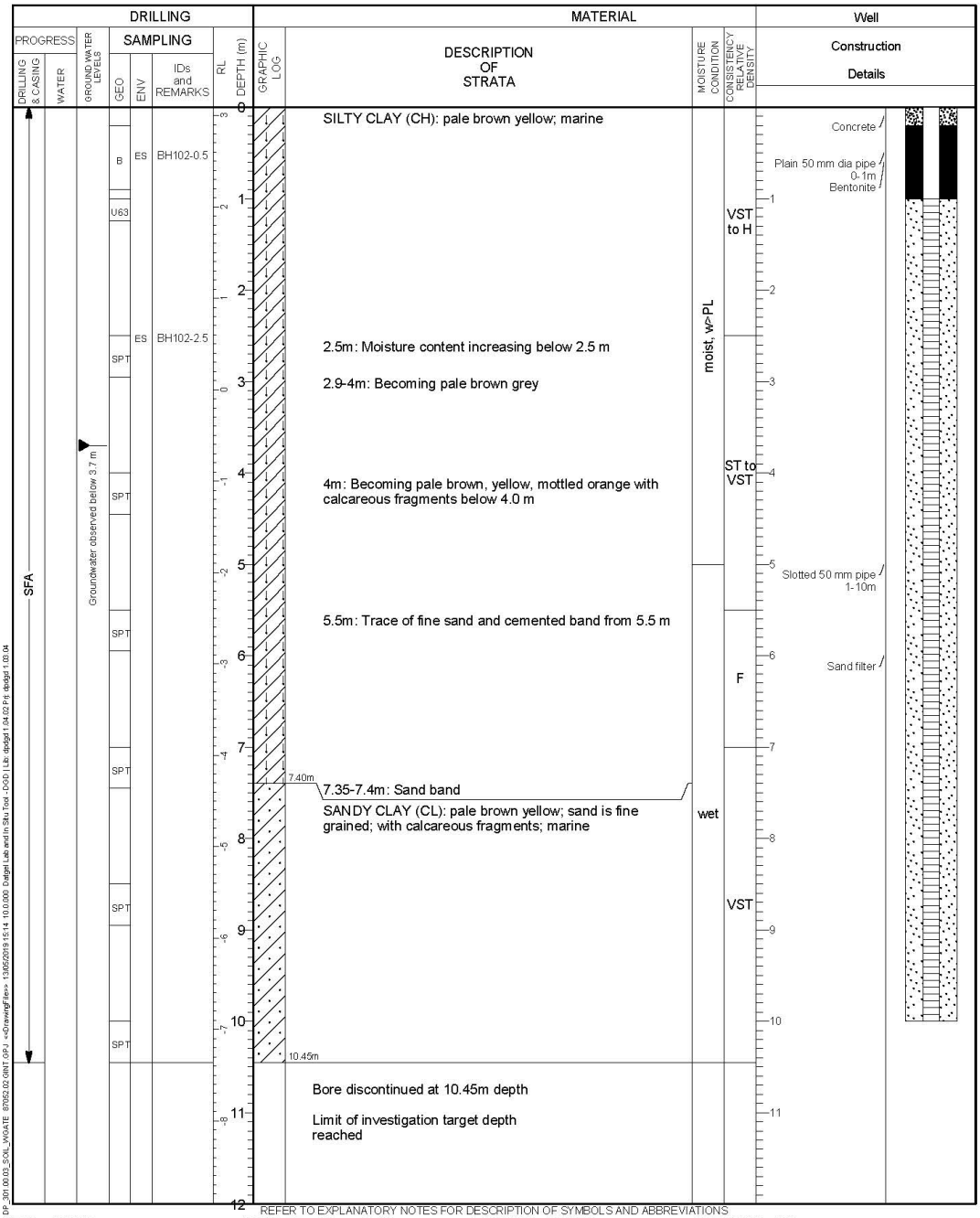
A	Auger sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
B	Bulk sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	▽	Water seep	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▼	Water level	SPT	Standard penetration test
E	Environmental Sample	PID	Photo ionisation detector (ppm)	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Balmoral Quay Pty Ltd
PROJECT: Balmoral Quay - Stage 5
LOCATION: Balmoral Quay, Rippleside

SURFACE LEVEL: 3.1 m
EASTING: 268318.21
NORTHING: 5776907.57
DIP/AZIMUTH: 90°/--

BORE No: BH 102
PROJECT NO: 87052.02
DATE: 1/4 - 2/4/2019
SHEET: 1 of 1



REFER TO EXPLANATORY NOTES FOR DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

RIG: DB520 **DRILLER:** Urban Drilling **LOGGED:** AP/MS **CHECKED:** AR

REMARKS: Co-ordinates and surface levels recorded with Altus NR3 dGPS unit **GRID DATUM:** WGS 84 UTM Zone 55

SAMPLING & IN SITU TESTING LEGEND

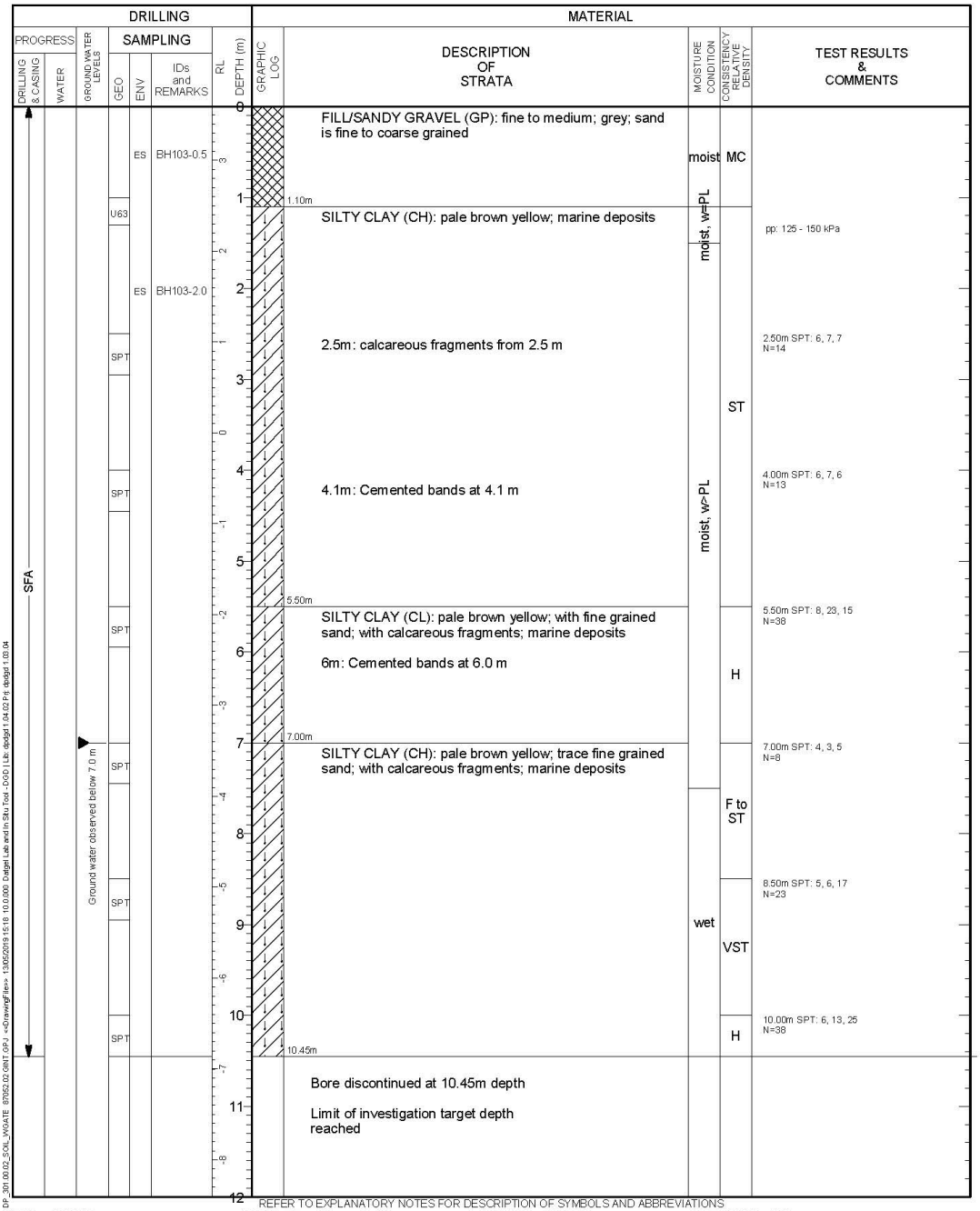
A	Auger sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
B	Bulk sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	▽	Water seep	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▼	Water level	SPT	Standard penetration test
E	Environmental Sample	PID	Photo ionisation detector (ppm)	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Balmoral Quay Pty Ltd
PROJECT: Balmoral Quay - Stage 5
LOCATION: Balmoral Quay, Rippleside

SURFACE LEVEL: 3.6 m
EASTING: 268354.39
NORTHING: 5776873.78
DIP/AZIMUTH: 90°/--

BORE No: BH 103
PROJECT NO: 87052.02
DATE: 2/4/2019
SHEET: 1 of 1



REFER TO EXPLANATORY NOTES FOR DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

RIG: DB520 **DRILLER:** Urban Drilling **LOGGED:** MS/AP **CHECKED:** AR

REMARKS: Co-ordinates and surface levels recorded with Altus NR3 dGPS unit **GRID DATUM:** WGS 84 UTM Zone 55

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
B	Bulk sample	U$_x$	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	▱	Water seep	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▼	Water level	SPT	Standard penetration test
E	Environmental Sample	PID	Photo ionisation detector (ppm)	V	Shear vane (kPa)

Appendix E Geotechnical Review Letter

TETRA TECH COFFEY

Level 11, 2 Riverside Quay,
Southbank
VIC 3006 Australia

t: +61 3 9290 7000
f: +61 3 9290 7499
tetratechcoffey.com

22 December 2021

Our ref: Eco Logical Australia Job No. 20269 _Coffey letter_01

Eco Logical Australia
Level 1, 23 West Fyans Street
Newtown, VIC 3220

Attention: Ms Caroline Hawker

Dear Caroline,

Balmoral Quay, Rippleside, Geelong – Geology encountered in boreholes

1. INTRODUCTION

This letter discusses the geological names and the geological ages of the materials encountered in three geotechnical boreholes drilled at the Stage 5 development at Balmoral Quay, Rippleside. Specifically, this letter considers boreholes BH101, BH102 and BH103 drilled by Douglas Partners Pty Ltd (Douglas) as presented in their report reference 87052.02 R.001.Rev0 dated 20 May 2019.

This letter responds to an email request of 17 December 2021 by Eco Logical Australia to Tetra Tech Coffey (Coffey).

2. PUBLISHED GEOLOGY

Figure 1 (attached) presents a part copy of the 1:63,360 Geelong Geological Map Sheet (Reference 1). This map shows the site and surrounds including Western Beach and Rippleside Park, and it indicates that:

- Tertiary age Moorabool Viaduct Sands blanket the tabletop like surface of Geelong, and
- Tertiary age Fyansford Formation occurs in the low cliffs along Western Beach of Corio Bay.

The legend to the map describes the Moorabool Viaduct Sands as comprising "*calcareous sand, clayey sand, quartzite, ferruginous sand and gravel*"; and the legend describes the Fyansford Formation as comprising "*calcareous sand, sandy clay, clay, silt, marl, sandy limestone – richly fossiliferous*". Note that "marl" is lime-rich mudstone.

Bowler, 1963 (Reference 2) notes that in the Corio area, fossils in the Moorabool Viaduct Sands include "… molluscan moulds with occasional oyster shells …" (page 114), and fossils in the Fyansford Formation include oysters and gastropod fossils (page 109).

Published fossil and strontium isotope age information (References 2, 3, 4) indicates the Moorabool Viaduct Sands to be late Miocene to Early Pliocene age (i.e., circa 3 to 5 million years old), and the Fyansford Formation to be early to mid-Miocene in age (i.e., circa 10 to 15 million years old).

3. SUMMARY OF BOREHOLES

Borehole BH101 was drilled from 13.1 m AHD (i.e., from the top of the cliff), whereas boreholes BH102 and BH103 were drilled from 3.1 m and 3.6 m AHD (i.e., close the beach level).

The materials encountered in the boreholes can be divided into 3 layers as shown in Table 1, which presents brief descriptions on the materials encountered in each layer, together with the SPT test N values and the interpreted consistency/ relative densities for each layer.

Table 1 Summary of Douglas borehole logs – materials and how drilled and depths

Layer	Thickness, m	Brief description	SPT N values	Consistency / Relative Density labels on logs
1	1.1, 1.2	Fill: Gravelly Sand and Sandy Gravel, grey. Present in BH101, BH103.	N = 37	-
2	2.3	Clayey Sand, grey-brown to orange-brown. Present in BH101 only.	N = R, 25, 20	Dense to Very Dense
3	>11.4, >10.4, >9.3	Silty Clay (1), brown-orange to pale yellow brown, becoming Sandy Clay. With bands of calcareous fragments and occasional cemented bands. Present in all boreholes.	N = 12 to 38 (2)	Stiff to Very Stiff to Hard (2)
Notes	1. In borehole BH101 the layer between 3.5 m and 8.5 m is labelled as Clayey Silt on the log; yet the laboratory test indicates it is a high plasticity clay. 2. The N values and associated consistency labels of N=9 and 7 in BH102 and N=8 in BH103 have not been used. Coffey considers these values to be unreliable as they were taken from solid auger flight drilled boreholes below the water table.			

4. GEOLOGICAL NAMES OF LAYERS 2 & 3 AND THEIR AGES

In their report, Douglas (page 2) suggests their boreholes encountered Fill overlying Moorabool Viaduct Sand and did not penetrate into the Fyansford Formation. Coffey consider this interpretation to be incorrect.

Coffey interpretation of the 3 layers presented in Table 1 is based on the material descriptions, the published geological information, and Coffey experience in the Corio area. Coffey interpret the 3 layers as follows:

- Layer 1 = Fill
- Layer 2 = Tertiary age Moorabool Viaduct Sand; based on the material comprising dense to very dense, orange-brown (ferruginous) sand, and being present above reduced level 10.8m in the upper parts of the site.
- Layer 3 = Tertiary age Fyansford Formation; based on the material comprising stiff to hard silty clay with fossiliferous layers (described as calcareous fragments) and occasional cemented bands, and being present beneath the lower parts of the site and extending below sea level.

As such, and given the age information presented in Section 2 of this letter, Layer 2 is circa 3 to 5 million years old, and Layer 3 is circa 10 to 15 million years old.

5. REFERENCES

1. Geological Survey of Victoria, 1963. 1:63,360 Geelong Geological Map Sheet No. 857, Zone 7.
2. Bowler, J. 1963. Tertiary stratigraphy and sedimentation in the Geelong–Maude area, Victoria. Roy. Soc. Vic. Proc. vol 76, pp 69–137.
3. Geological Survey of Victoria, 1963. 1:63,360 Geelong Geological Map Sheet No. 857, Zone 7.
4. Dickinson, J et al 2002. Origin and timing of the Miocene–Pliocene unconformity in southeast Australia. Journal of Sedimentary Research, Vol. 72, No. 2, pp. 288–303.

6. CLOSURE

We trust this letter is sufficient for your current purposes. Should you require further information regarding this letter, please contact the undersigned.

For and on behalf of Coffey

Robert Wilson
Senior Principal Engineering Geologist

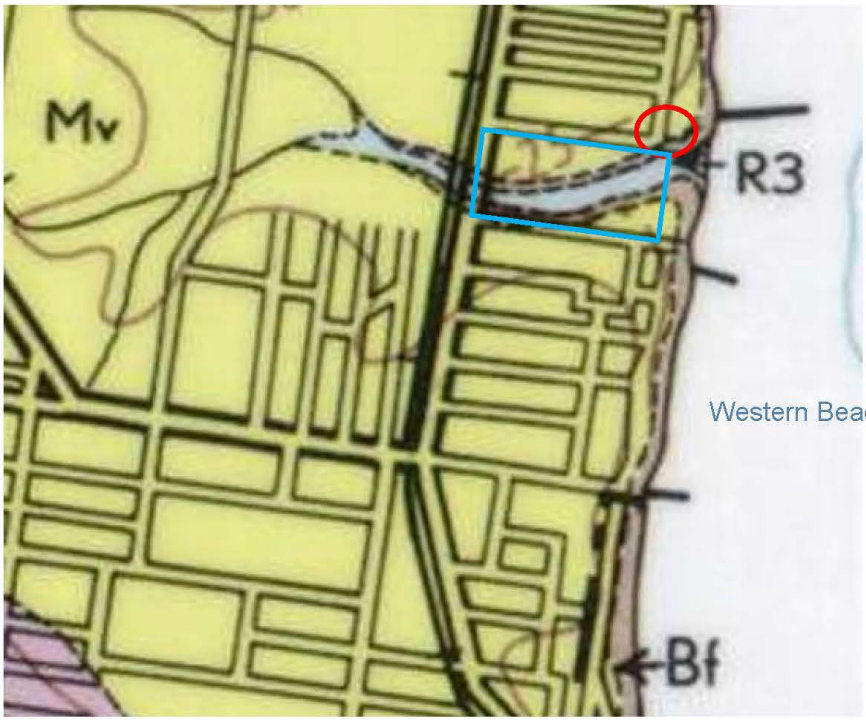
Attachments:

Figure 1 Part copy 1:63,360 Geelong Geological Sheet

Important information about your TetraTech Coffey report (2 pages)

Please note: This report must be read in the context of the attached Important information about your TetraTech Coffey report.

Figure 1 Part copy 1:63,360 Geelong Geological Sheet

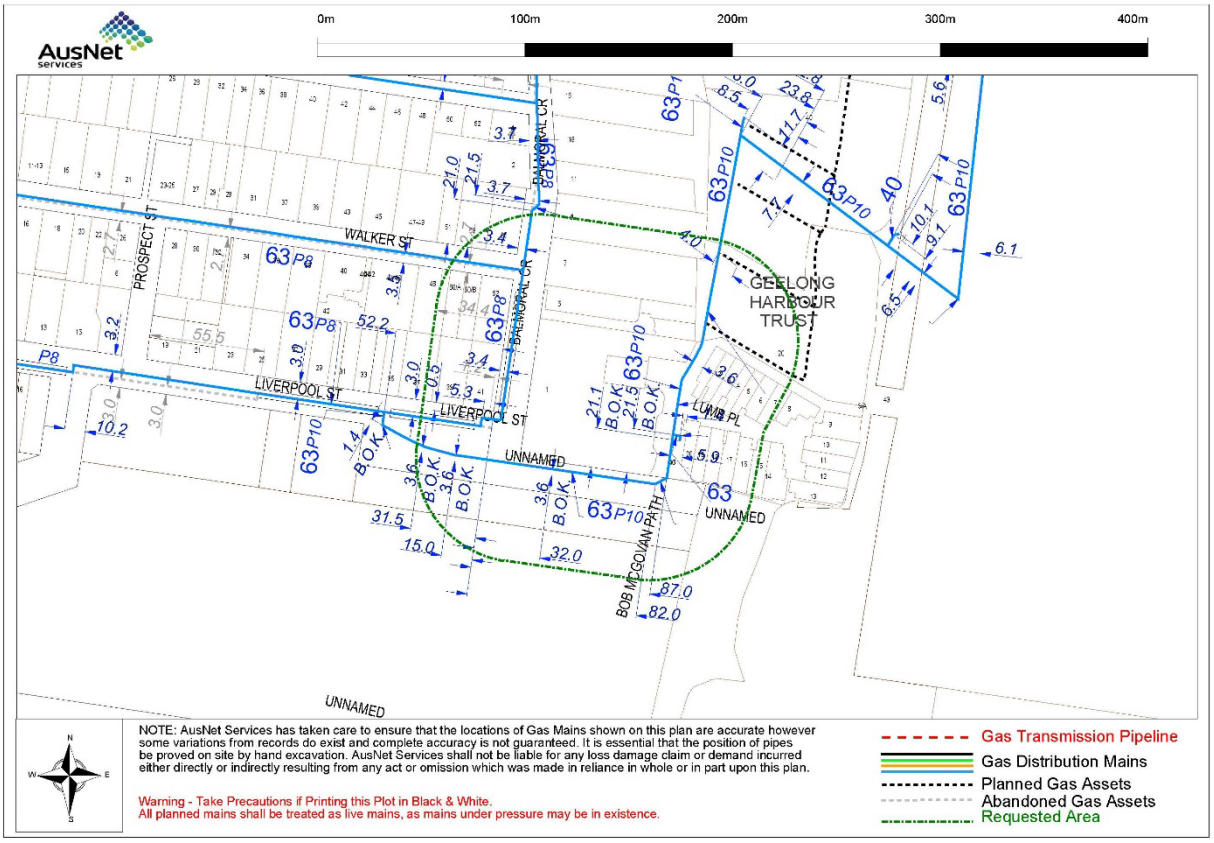


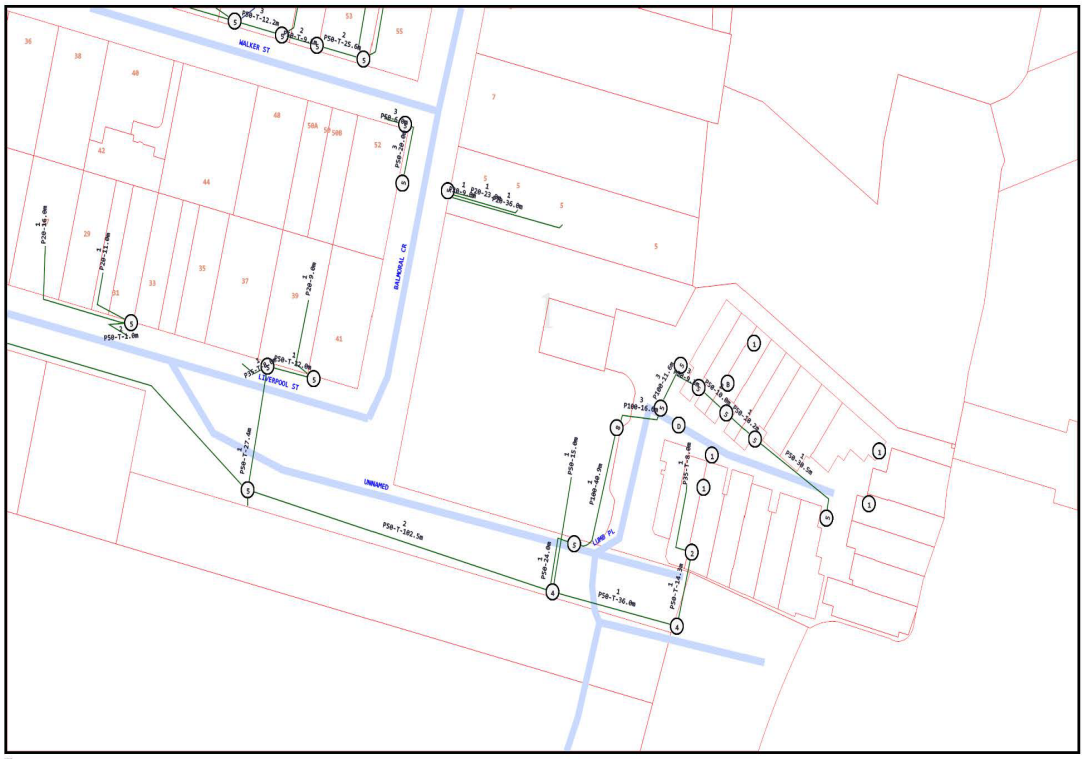
Symbols:

Red circle = site; Blue oblong = Rippleside Park

Mv – yellow = Moorabool Viaduct Sands; Bf – brown = Fyansford Formation

Appendix F Dial Before You Dig Utilities





Emergency Contacts

You must immediately report any damage to the **nbn™** network that you are/become aware of. Notification may be by telephone - 1800 626 329.

Telstra	For all Telstra DBYD plan enquiries - email - Telstra.Plans@team.telstra.com For urgent onsite contact only - ph 1800 653 935 (bus hrs)	Sequence Number: 208353518
TELSTRA CORPORATION LIMITED A.C.N. 051 775 556		Please read Duty of Care prior to any excavating
Generated On 21/02/2022 09:23:36		

WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

Page 1 of 1

OptiComm National Broadband Fibre

Sequence No: 208353522
Job No: 31431389
Location: 11 Harbourside Drive, Rippleside, VIC 3215

DIAL BEFORE YOU DIG www.1100.com.au The Essential First Step.

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither OptiComm nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

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AU.OptiComm - Response Plan.docx (27 Jul 2020)

CITY OF GREATER GEELONG

Job # 31431389
Seq # 208353519
Provided by City of Greater Geelong

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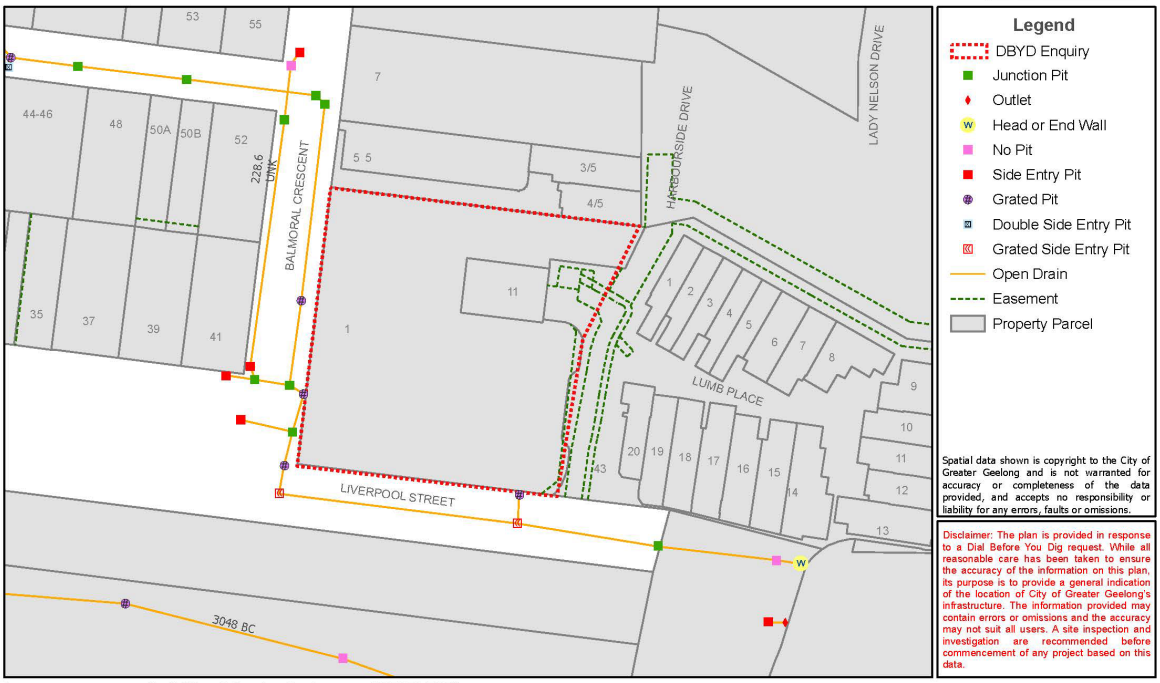

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Disclaimer: The plan is provided in response to a Dial Before You Dig request. While all reasonable care has been taken to ensure the accuracy of the information on this plan, its purpose is to provide a general indication of the location of City of Greater Geelong's infrastructure. The information provided may contain errors or omissions and the accuracy may not suit all users. A site inspection and investigation are recommended before commencement of any project based on this data.

In an emergency contact City of Greater Geelong on 03 5272 5272
21/02/22 (valid for 30 days)
Plans generated by SmarterWX™ Automate

0 10 20 40 m N

Scale 1:1,000

Barwon Water

Job # 31431389
Seq # 208353520
Provided by Barwon Water

DIAL BEFORE YOU DIG www.1100.com.au

Legend

- DBYD Enquiry
- Water Pipe
- Gravity Sewer Pipe
- Pressure Sewer Pipe
- Water Fitting
- Sewer Fitting/Manhole

Disclaimer: Barwon Water does not provide any warranty, express or implied, as to the accuracy, completeness, currency or reliability of plans provided as part of the 'DBYD' program. Furthermore, Barwon Water does not provide a warranty that the scale of the plans is accurate, or that they are suitable for a specific purpose. These plans are intended for general information only. Barwon Water is not responsible and does not accept liability for any loss, expense or damage (direct or indirect) which has arisen from reliance on any plans provided by Barwon Water. It is the responsibility of users of the plans to ensure the accuracy of the plans by independent means and to take care when undertaking works that have the potential to damage Barwon Water assets.

In an emergency contact Barwon Water on 1300 656 007
21/02/22 (valid for 30 days)
Plans generated by SmarterWX™ Automate

0 10 20 40 m

N

Scale 1:1,000

Appendix G Glossary

Aboriginal place: Aboriginal place is defined under s 5 of the *Aboriginal Heritage Act 2006* (Vic) as follows:

5 What is an Aboriginal place?

(1) For the purposes of this Act, an Aboriginal place is an area in Victoria or the coastal waters of Victoria that is of cultural heritage significance to Aboriginal people generally or of a particular community or group of Aboriginal people in Victoria.

(2) For the purposes of subsection (1), *area* includes any one or more of the following—

(a) an area of land;

(b) an expanse of water;

(c) a natural feature, formation or landscape;

(d) an archaeological site, feature or deposit;

(e) the area immediately surrounding anything referred to in paragraphs (c) and (d), to the extent that it cannot be separated from the thing without diminishing or destroying the cultural heritage significance attached to the thing by Aboriginal people;

(f) land set aside for the purpose of enabling Aboriginal ancestral remains to be re-interred or otherwise deposited on a permanent basis;

(g) a building or structure.

Activity: the development or use of the land (s 4, *Aboriginal Heritage Act 2006* (Vic))

Activity Area: the area or areas to be used or developed for an activity (s 5, *Aboriginal Heritage Regulations 2006* (Vic))

Angular fragment: a piece of stone that is blocky or angular, not flake-like.

Archaeology: The study of the material remains of the human past.

Archaeological site: A place/location of either Aboriginal or non-Aboriginal origin that contains material remains relating to the human past

Artefact: Any product made by human hands or caused to be made through human actions. _____ A scatter of stone artefacts wherein stone artefacts are identified at densities exceeding 10 within an area of approximately 10x10m. Artefact scatters are often the only physical remains of places where Aborigines have camped, prepared and eaten meals and worked stone material.

Artefact scatter: A surface scatter of stone artefacts is defined as being the presence of items of cultural material within a given area.

Backed blade (geometric microlith): Backing is the process by which one or more margins contain consistent retouch opposite to the sharp working edge. A backed blade is a blade flake that has been abruptly retouched along one or more margins opposite the sharp working edge. Backed pieces include backed blades and geometric microliths. Backed blades are a feature of the Australian Small Tool Tradition dating from between 5,000 and 1,000 years ago in southern Australia (Mulvaney 1975).

Backing: Steep retouch on an artefact (e.g. backed blade).

Blade: A flake that is at least twice as long as it is wide.

Bipolar: A core or a flake which, presumably, has been struck on an anvil. That is, the core from which the flake has been struck has been rotated before the flake has been struck off. Bifacial platforms often indicate that the flake has come off a heavily worked core.

BP: Before Present. The present is defined as 1950.

Burial: A burial site is usually a subsurface pit containing human remains and sometimes associated artefacts.

Core: An artefact from which flakes have been detached using a hammerstone. Core types include blade, single platform, multiplatform and bipolar forms. These artefacts exhibit a series of negative flake scars, each of which represents the removal of a flake.

Cortex: Original or natural (unflaked) surface of a stone. This may be further divided into nodule, pebble and terrestrial cortex indicating the original source of the material.

Debitage: Small unmodified flakes, flaked pieces and blocky pieces produced as part of the flaking process, but discarded unused.

Ethnography: The scientific description of living cultures.

Flake: A stone piece removed from a core by percussion (striking it) or by pressure. It is identified by the presence of a striking platform and bulb of percussion, not usually found on a naturally shattered stone.

Broken Flake: Any stone retaining partial diagnostic features of a flake.

Complete/Whole Flake: An artefact exhibiting a ventral surface (where the flake was originally connected to the core), dorsal surface (the surface that used to be part of the exterior of the core), platform, termination and bulb of percussion.

Distal Flake: any flake on which the breakage removes the platform but retains the termination.

Primary flake: The first flakes struck off a core in order to create a platform from which other flakes can then be struck.

Proximal Flake: Any flake on which the breakage removes the termination but retains the platform.

Secondary flaking/retouch: Secondary working of a stone artefact after its manufacture. This was often done to resharpen stone tools after use, or in the production of formal tool types such as blade flakes and scrapers.

Flake Scar: A negative impression on a piece of stone or rock surface from which a flake has been removed. Generally, a flake scar will show the characteristics of a flake in reverse (i.e. negative bulb of percussion).

Focal platform: This is a term used to describe the shape of the platform on a flake. A focal platform is narrower than the body of the flake. Focal platform flakes are produced when flakes are struck off near the edge of the platform on a core.

Formal Tool: An artefact which has been shaped by flaking, including retouch, or grinding to a predetermined form for use as a tool. Formal tools include scrapers, backed pieces and axes.

Geocentric Datum of Australia 1994 (GDA94): a system of latitudes and longitudes, or east and north coordinates, centred at the centre of the earth's mass. GDA94 is compatible with modern positioning techniques such as the Global Positioning System (GPS). It supersedes older coordinate systems (AGD66, AGD84). GDA94 is based on a global framework, the IERS Terrestrial Reference Frame (ITRF), but is fixed to a number of reference points in Australia. GDA94 is the Victorian Government Standard and spatial coordinates for excavations, transects and places in CHMP documents.

Geometric microlith: A blade that has been trimmed on one or two margins to produce a symmetrical backed piece which is roughly triangular in plan.

Grindstones: upper (handstone) and lower (basal) stones used to grind plants for food and medicine and/or ochre for painting. A handstone sometimes doubles as a hammerstone and/or anvil.

Hammerstone: A piece of stone, often a creek/river pebble/cobble, which has been used to detach flakes from a core by percussion. During flaking, the edges of the hammerstone become 'bruised' or crushed by impact with the core.

Hearth: Usually a subsurface feature found eroding out of a river or creek bank or in a sand dune, indicating a place where Aboriginal people cooked food. The remains of a hearth are usually identifiable by the presence of charcoal and sometimes clay balls (like brick fragments) and hearth stones. Remains of burnt bone or shell are sometimes preserved within a hearth.

Historic site: Sites/areas that contain extant (standing) remains of pre-1950 non-Aboriginal occupation. Historic sites may or may not also contain archaeological remains (Aboriginal and/or historic).

Holocene, recent or postglacial period: The time from the end of the Pleistocene Ice Age (c. 10,300 BP) to the present day.

Implement: An artefact that has been designed, but not necessarily utilised (Hiscock& Mitchell 1990, 26).

Low Density Artefact Distribution (LDAD): The occurrence of stone artefacts at densities of up to 10 in an area of approximately 10x10m. A low density artefact distribution may incorporate multiple occurrences of stone artefacts should they comply with the densities outlined above.

***In situ*:** Refers to cultural material that is discovered as being undisturbed and considered to be in its original context. That is, material which, when identified is considered to be in the same location when the site was abandoned.

Lithic: Anything made of stone.

Map Grid of Australia (MGA): The official coordinate projection for use with the Geocentric Datum of Australia 1994 (GDA94).

Manuport: Foreign fragment, chunk or lump of stone which shows no clear signs of flaking but is out of geological context and must have been transported to the site by people.

Microlith: A flake or blade that has been abruptly retouched along one or more margins opposite an acute (sharp) edge. Backed pieces include backed blades and geometric microliths. They are thought to have been hafted onto wooden handles to produce composite cutting tools. Backed pieces are a feature of the 'Australian small tool tradition', dating from between 5,000 and 1,000 years ago in southern Australia (Mulvaney and Kamminga 1999: 234-236).

Mound: these places, often appearing as raised areas of darker soil, are found most commonly in the volcanic plains of western Victoria or on higher ground near bodies of water. The majority were probably formed by a slow build-up of debris resulting from earth-oven cooking; although some may have been formed by the collapse of sod or turf structures.

Percussion: The act of hitting a core with a hammerstone to strike off flakes.

Pleistocene: The dates for the beginning and end of the Pleistocene generally correspond with the last Ice Age. That is from 2.6 million years ago to around 11,700 years ago. The period ends with the gradual retreat of the ice sheets, which reached their present conditions around 10,300 BP.

Pre-contact: before contact with non-Aboriginal people.

Post-contact: after contact with non-Aboriginal people.

Quarry (stone/ochre source): An Aboriginal quarry site occurs where stone or ochre is exposed and has been extracted by Aboriginal people in the past. The rock types most commonly quarried for artefact manufacture in Victoria include silcrete, quartz, quartzite, chert and fine-grained volcanics such as greenstone.

Raw material: Organic or inorganic matter that has not been processed by people.

Regolith: a layer of loose, heterogeneous superficial deposits covering solid rock. It includes dust, soil, broken rock, and other related materials.

Retouch: A flake, flaked piece or core with intentional secondary flaking along one or more edges.

Rock art: paintings, engravings and shallow relief work on natural rock surfaces. Paintings were often produced by mineral pigments, such as ochre, combined with clay and usually mixed with water to form a paste or liquid that was applied to an unprepared rock surface. Rock engravings were made by incising, pounding, pecking or chiselling a design into a rock surface.

Rock shelter/cave: These are sites that are located within a rock shelter/overhang or cave. The archaeological deposits within such sites can vary considerably but are often predominantly lithic. Depending on their location, the archaeological deposits may also include midden deposits of shellfish,

fish or terrestrial fauna. Due to the often-undisturbed deposits at these sites, they are potentially very valuable sites and are generally considered of high scientific significance. Instances where rock shelter sites also possess artwork on the stone walls are considered rock shelters/art sites combined.

Scarred tree: Scars on trees may be the result of removal of strips of bark by Aborigines for the manufacture of utensils, canoes or for shelter; or resulting from small notches chopped into the bark to provide toe and hand holds for climbers after possums, koalas and/or views of the surrounding area.

Shell Midden: A scatter and/or deposit comprised predominantly of shell, sometimes containing stone artefacts, charcoal, bone and manuports. These site types are normally found in association with coastlines, rivers, creeks and swamps - wherever coastal, riverine or estuarine shellfish resources were accessed and exploited.

Significance: the importance of a heritage place or place for aesthetic, historic, scientific or social values for past, present or future generations.

Silcrete: A sedimentary rock that is 'formed through the impregnation of a sedimentary layer with silica of quartz grains in a matrix of either amorphous or fine-grained silica' (Holdaway & Stern 2004: 24).

Stratified deposit: material that has been laid down, over time, in distinguishable layers.

Stratigraphy: Layering.

Stone Artefact: A piece of stone that has been formed by Aboriginal people to be used as a tool or is a by-product of Aboriginal stone tool manufacturing activities. Stone artefacts can be flaked such as points and scrapers or ground such as axes and grinding stones.

Scraper: A tool used for scraping. A flake with one or more margins of continuous retouch.

Thumbnail scraper: A small flake with a convex scraper edge, shaped like a thumbnail and located opposite the flake's platform.

Tool: An artefact that shows evidence that it has actually been used (e.g. edge damage) (Hiscock & Mitchell 1990, 26).

Transect: A fixed path along which one records archaeological remains.

Use wear: Tiny flakes or chips that have been broken off the edges of a stone artefact during use.

Utilised Artefact: A flake, flaked piece or core which has irregular small flake scarring along one or more margins that does not represent platform preparation.

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