

Mordialloc Bypass Project

Historical Cultural Heritage Impact Assessment



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Executive Summary

MRPA proposes to construct a new arterial road in Melbourne's south-eastern suburbs between Mornington Peninsula Freeway and Dingley Bypass (the 'activity'). The Mordialloc Bypass will also provide connections to four main arterial roads, including Governor Road, Lower Dandenong Road, Centre Dandenong Road and Dingley Bypass.

This assessment addresses the key issues concerning archaeological potential of known and unknown non-Aboriginal historical cultural heritage within the study area. This report combines the results of a desktop analysis (land use history) and archaeological assessment (survey) to determine the overall archaeological potential within the study area, and investigates the likely impacts proposed by the activity. In addition, archaeological management recommendations and contingencies are presented at the end of this report.

The impacts of the Mordialloc Bypass are required to be assessed against the evaluation objectives set out in the EES scoping requirements issued by the Minister for Planning. These objectives identify the desired outcomes to be achieved in managing the potential impacts of constructing and operating the project in accordance with the Ministerial guidelines for assessment of environmental effects under the *Environment Effects Act 1987*.

The following evaluation objective is relevant to the historical cultural heritage assessment:

- To avoid or minimise adverse effects on Aboriginal and historical cultural heritage values.

To assess this objective desktop and field survey assessments of the project area were undertaken.

The desktop assessment reviewed the land use history, historical places and archaeological potential within the study area. The results determined that a variety of land use activities had occurred, including vegetation clearance and land preparation for pastoral and agricultural uses, modifications to the hydrology of the region, development of commercial and industrial enterprises and the construction and upgrades to road, rail and utility infrastructure. It was determined that a single heritage place, the 'Braeside Park Precinct' (HO104) Heritage Overlay, is located within the study area and will be affected by the proposed activity. The VHR site of the Former Christ Church of England (H0225), located adjacent to the study area, will not be affected by the proposed activity.

The field survey targeted areas identified by the desktop assessment which indicated a high level of archaeological potential. Overall, the survey demonstrated a low potential for archaeological features and/or deposits of significance to be present within the surveyed areas of the study area.

This assessment has identified only very limited potential for impacts to registered and or potential historical cultural heritage within the project area. Where impacts have been identified, in relation to Braeside Park Precinct (HO104), these impacts will be limited in effect and will largely occur on land formerly associated with the treatment works but largely devoid of significant built fabric. Impacts to the more significant heritage components of this place were previously coincidentally avoided through the realignment to the proposed roadway to avoid Parks Victoria occupied buildings. This reduction in impact will be maintained by the project in its current alignment.

No other registered places will be impacted by the project.

The likelihood of impacts to currently unidentified cultural heritage are considered to be low given the relatively dispersed nature of occupation within the project area for most of the post-contact period. The discovery of places or archaeological features during construction can be readily managed under the requirements of the *Heritage Act 2017*.

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Photo caption (Cover plate): Photograph showing investigation Area C (view south)
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1.0 Introduction

1.1 Preamble

On behalf of MRPA, WSP Australia Pty Ltd. (WSP) has engaged Andrew Long and Associates (ALA) to undertake a historical cultural heritage assessment of several property parcels that are to be impacted by the proposed Mordialloc Bypass Project (the 'study area').

As outlined by the Mordialloc Bypass Environment Effects Statement (ESS) (WSP 2017:1), MRPA proposes to construct a new arterial road in Melbourne's south-eastern suburbs between Mornington Peninsula Freeway and Dingley Bypass (the 'activity'). The Mordialloc Bypass will also provide connections to four main arterial roads, including Governor Road, Lower Dandenong Road, Centre Dandenong Road and Dingley Bypass.

This assessment addresses the key issues concerning archaeological potential of known and unknown non-Aboriginal historical cultural heritage within the study area. This report combines the results of a desktop analysis (land use history) and archaeological assessment (survey) to determine the overall archaeological potential within the study area, and investigates the likely impacts proposed by the activity. In addition, archaeological management recommendations and contingencies are presented at the end of this report.

1.2 Project Description

The Mordialloc Bypass project (the project) is the proposed construction of a new freeway connecting the Dingley Bypass with the Mornington Peninsula Freeway; and is predominately to be constructed within an existing road reservation. The project passes between the western boundary of Braeside Park and the eastern boundary of the Woodlands Estate (constructed) wetlands, traverses constructed wetlands at Waterways and approaches to within one kilometre of the Ramsar-listed Edithvale-Seaford Wetlands. The northern and southern ends of the project pass through or border the South East Green Wedge.

The project corridor is approximately 9.7 kilometres in length, comprising two, two-lane 7.5 kilometre long carriageways (with a path for walking and cycling) along the greenfield alignment, and 2.2 kilometres of roadworks required to integrate the project with the Mornington Peninsula Freeway. It is expected that each carriageway will provide for two 3.5 metre wide lanes, with a 3.0 metre wide outside shoulder and 1.0 metre wide inside shoulder. The Mordialloc Bypass will also provide connections from the freeway onto the Dingley Bypass, Centre Dandenong Road, Lower Dandenong Road, Governor Road, Springvale Road and new north facing ramps at Thames Promenade. There will also be an overpass at Old Dandenong Road. Mordialloc Creek and the associated Waterways Wetlands will be spanned by twin 400 metre long bridges.

The proposed alignment allows for a future upgrade of the project to a six-lane freeway standard road within the construction footprint.

The proposed alignment is generally located within the existing road reservation, most of which is already covered by Public Acquisition Overlay, and some of which is already in VicRoads' ownership.

The proposed project consists of:

- Four-lane freeway standard cross-section (two lanes in each direction), divided by a centre median
- 100 km/hr posted speed limit
- Full diamond interchanges at Springvale Road, Governor Road and Lower Dandenong Road whereby Mordialloc Bypass is elevated over the arterial roadway with northbound and southbound entry and exit ramps providing access for all directions of travel.
- Half single point urban interchange at Centre Dandenong Road whereby Mordialloc Bypass is elevated over Centre Dandenong Road and southbound entry and northbound exit ramps provide accessibility to and from the south.
- Addition of northbound entry and southbound exit ramps at the existing Mornington Peninsula Freeway interchange at Thames Promenade to provide access to and from Mordialloc Bypass. The existing interchange provides ramps to and from Mornington Peninsula Freeway to the south only. The proposed entry and exit ramps will create a full diamond interchange at Thames Promenade.
- An at-grade T-signalised intersection at Dingley Bypass
- Elevation of the bypass over Old Dandenong Road and Bowen Parkway to maintain existing connectivity on these routes
- Shared use path running north-south along the length of the Mordialloc Bypass and connecting existing paths along the north side of Dingley Bypass and the south side of Springvale Road adjacent to Chelsea Heights Hotel
- Bus queue jump lanes provided in intersection configurations at the proposed Springvale Road and Centre Dandenong Road interchanges

The report has considered and made provision for the possibility that the project may be upgraded to freeway standard, with resultant conversion of signalised intersections to interchanges.

1.2 Location of the Study Area

The study area is a 9 km linear corridor located between the existing Dingley Bypass (Dingley Village) and the Mornington Peninsula Freeway (Chelsea Heights), within the City of Kingston LGA. The study area is approximately 25 km south-east of the Melbourne CBD. The northern section of the study area is bounded by Dingley Bypass, and extends southward intersecting with Dandenong Road, Centre Dandenong Road, Lower Dandenong Road, Governor Road and Springvale Road, before converging with the Mornington Peninsula Freeway at its southern extent. The study area is approximately 1.36 km² in total area, and presently comprises various major roads, light industrial areas, artificial wetlands (Mordialloc Creek), pastoral areas and numerous utility installations.

In a geomorphological context, the study area exists on the *Carrum Downs in the Central Sunland's of the Eastern Plains (Geomorphological Unit 7.1.3)*. However, typical landscape characteristics such as wetlands, dunes and Red Gum forests have been previously modified or removed in large sections across the study area, as a result of historical and modern land use activities. The current condition of the landscape within the study area is both directly and indirectly (e.g. regional scale) the result of

land preparation activities associated with previous vegetation clearance; early pastoralism and agriculture (including the draining of the Carrum Carrum Swamp) and the channelisation of Mordialloc Creek and development of an artificial wetland. Extensive recent urbanisation across the region has also significantly altered the landscape including the establishment of market gardens, construction and maintenance of roadways, residential, commercial and industrial development, the construction and decommissioning of the Braeside Treatment Plant, and the installation of utility and service infrastructure. As a result, the study area currently contains a combination of urban spaces with a number of mixed use activities which have eventuated over-time.

The study area is situated across 11 planning zones under the City of Kingston Planning Scheme.¹ These include commercial, general residential, green wedge, industrial, public park and recreation, road and urban floodway zones (Table 1). Map 1 shows the location of the study area and Table 2 provides the relevant cadastral details of the study area, which derive from Land Use and Planning Assessment.²

Table 1: Planning Zones

Planning Scheme	Planning Zone
City of Kingston	COMMERCIAL 2 ZONE (C2Z)
City of Kingston	GENERAL RESIDENTIAL ZONE - SCHEDULE 3 (GRZ3)
City of Kingston	GREEN WEDGE ZONE (GWZ)
City of Kingston	GREEN WEDGE ZONE - SCHEDULE 1 (GWZ1)
City of Kingston	GREEN WEDGE ZONE - SCHEDULE 2 (GWZ2)
City of Kingston	INDUSTRIAL 1 ZONE (1N1Z)
City of Kingston	PUBLIC PARK AND RECREATION ZONE (PPRZ)
City of Kingston	PUBLIC USE ZONE - OTHER PUBLIC USE (PUZ7)
City of Kingston	PUBLIC USE ZONE - SERVICE AND UTILITY (PUZ1)
City of Kingston	ROAD ZONE - CATEGORY 1 (RDZ1)
City of Kingston	URBAN FLOODWAY ZONE (UFZ)

Table 2: Cadastral information

Property/SPI	Address	Approx. Size (m ²)
23\LP94826	N/A (outside study area)	0.00
RES1\LP133350	Lower Dandenong Road, Dingley Village, 3172	91.07
CP101726	414-426 Lower Dandenong Road, Braeside, 3195	146.53
CP106278	1-7 Bell Grove, Braeside, 3195	279.87
1\TP574271	417-433 Lower Dandenong Road, Dingley Village, 3172	311.06
R1\LP133349	Twofold Close, Dingley Village, 3172	397.83
R2\LP133350	Lower Dandenong Road, Dingley Village, 3172	445.99
CP161872	63-67 Tarnard Drive, Braeside, 3195	483.82
1\TP241306	34-36 Tootal Road, Dingley Village, 3172	939.06
1\TP412980	34-36 Tootal Road, Dingley Village, 3172	1133.07
RES1\PS327478	47 Mills Road, Braeside, 3195	1723.64

¹ Environment, Land, water and Planning – Kingston Planning Scheme: http://planning-schemes.delwp.vic.gov.au/schemes/combined-ordinances/Kingston_PS_Ordinance.pdf – accessed 20/02/2018.

² VicRoads – Mordialloc Bypass Environment Effects Statement: Land Use and Planning Assessment prepared by Bartsch and Lord (2017).

Property/SPI	Address	Approx. Size (m²)
B\LP204907	Boundary Road, Dingley Village, 3172	2132.46
1\TP326138	542-548 Heatherton Road, Clayton South, 3169	2252.61
1\TP319786	542-548 Heatherton Road, Clayton South, 3169	2711.67
1\PS804736	94 Tootal Road, Dingley Village, 3172	2853.10
2\PS431563	Governor Road, Braeside, 3195	4117.83
1\TP126614	Rear 550 Heatherton Road, Dingley Village, 3172	4841.78
1\TP102015	339-351 Old Dandenong Road, Dingley Village, 3172	5179.14
UNKNOWN	N/A	5901.38
3\TP749429	Springvale Road, Aspendale Gardens, 3195	5959.26
1\TP143175	572-576 Boundary Road, Dingley Village, 3172	7702.42
1\TP558168	Centre Dandenong Road, Dingley Village, 3172	8013.99
1\TP171639	Centre Dandenong Road, Dingley Village, 3172	8013.99
1\TP529824	34-36 Tootal Road, Dingley Village, 3172	11435.63
2012\PP3025	Wells Road, Aspendale Gardens, 3195	12718.00
A\PS605114	Rear 13-17 Maidenhair Mews, Aspendale Gardens, 3195	17644.21
B\PS436427	225-289 Wells Road, Aspendale Gardens, 3195	19438.41
1\PS409861	Unit 1/ Grange Road, Dingley Village, 3172	22121.41
1\TP675948	Grange Road, Dingley Village, 3172	22493.37
1\TP597813	411-415 Lower Dandenong Road, Dingley Village, 3172	24284.40
1\TP592493	Springvale Road, Aspendale Gardens, 3195	25324.93
1\TP339944	572-576 Boundary Road, Dingley Village, 3172	26504.71
1\TP512252	572-576 Boundary Road, Dingley Village, 3172	26504.71
A\LP204907	260 Centre Dandenong Road, Dingley Village, 3172	34471.75
2\LP141797	Follett Road, Dingley Village, 3172	36330.57
1\PS431563	Governor Road, Braeside, 3195	37557.35
2\PS404186	305-357 Centre Dandenong Road, Dingley Village, 3172	41782.58
1\TP119053	Grange Road, Dingley Village, 3172	45600.96
1\TP95013	260 Centre Dandenong Road, Dingley Village, 3172	50776.81
2\TP24693	340-348 Old Dandenong Road, Dingley Village, 3172	55509.66
3\TP24693	340-348 Old Dandenong Road, Dingley Village, 3172	55509.66
E\LP135078	411-415 Lower Dandenong Road, Dingley Village, 3172	57399.31
B\PS443745	Springvale Road, Aspendale Gardens, 3195	58002.52
R21\PS435322	N/A	123744.82
1\PS420865	Lower Dandenong Road, Braeside, 3195	272135.19



Map 1: Location map showing the study area

2.0 EES Objectives and Scoping Requirements

2.1 EES Objectives

The impacts of the Mordialloc Bypass are required to be assessed against the evaluation objectives set out in the EES scoping requirements issued by the Minister for Planning. These objectives identify the desired outcomes to be achieved in managing the potential impacts of constructing and operating the project in accordance with the Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1987.

The following evaluation objective is relevant to the historical cultural heritage assessment:

- To avoid or minimise adverse effects on Aboriginal and historical cultural heritage values.

2.2 Scoping Requirements

The aspects from the Scoping Requirements relevant to the historical cultural heritage evaluation objective/s are presented below, as well as the location where these items have been addressed in this report.

Key issues

- Potential for adverse effects on known and unknown and non-Aboriginal cultural heritage values.
- Potential for permanent loss of significant heritage values.

Priorities for characterising the existing environment

- Document known and previously unidentified places and sites of historic cultural heritage significance within and adjoining the project area, including any areas of significant archaeological interest, in accordance with the *Guidelines for Conducting Archaeological Surveys* (Heritage Victoria, 2008) as updated in 2013.

Design and mitigation measures

- Describe and evaluate potential and proposed design and construction mitigation methods to address effects on historic cultural heritage, particularly near the former Carrum Carrum Swamp.

Assessment of likely effects

- Assess the potential effects on historic cultural heritage resulting from the project and relevant alternatives.
- Assess the potential effects on sites and places of historic and cultural heritage significance, having regard to the *Guidelines for Investigating Historical Archaeological Artefacts and Sites* (Heritage Victoria, 2014).

Approach to manage performance

- Identify further methods proposed to manage risks of effects on historic cultural heritage values, including as part of the EMF (see Section 5)
- Respond to requirements under the AH Act, such as preparation of a draft cultural heritage management plan (CHMP).

- Outline and evaluate proposed additional measures to manage risks of effects on sites and places of Aboriginal cultural heritage significance, within the framework of a draft CHMP³, and on sites and places of historic cultural heritage significance, including as part of the EMF (see Section 5).

³ Refer to EES Advisory Note: *Aboriginal Cultural Heritage and the Environment Effects Process* for further advice.

3.0 Legislation and Policy

The following listed regulatory bodies and legislation relates to the management of non-Aboriginal, historical cultural heritage objects and places within Victoria, in addition to presenting the results of historical heritage register search relevant to the current study area (see Section 2.1.5).

3.1 Heritage Act 2017

Heritage Victoria is the State Government body that administers the *Heritage Act 2017* (Vic). The Act serves to protect all categories of historical cultural heritage relating to non-Aboriginal settlement of Victoria that includes historic buildings, shipwrecks and archaeological sites. The main purposes of the *Heritage Act 2017* are to provide protection, conservation and registration for all archaeological artefacts and sites as well as the establishment of the Heritage Council and Victorian Heritage Register (VHR) or the Victorian Heritage Inventory (VHI).

Victorian Heritage Register

The VHR exists under Act and provides protection to places or objects of state significance.

- The Heritage Council of Victoria, which is established under the Act, determines what places/objects are included on the VHR.
- Under Section 87 of the Act it is an offence to damage, disturb or alter a place on the VHR.
- Permits for works to places are granted under Section 93 of the Act.
- A place that is included in the Heritage Register may also be recorded as a site in the Heritage Inventory (as per Section 118 of the Act).

Victorian Heritage Inventory

The Act protects all historical archaeological sites in the state, and all known sites are included in the VHI.

- The VHI includes sites whose archaeological significance ranges from high to low, including places with archaeological potential.
- Consent from HV is required to disturb or destroy historical archaeological sites, places, buildings or structures listed on the VHI. An application may be made to the Executive Director for a Consent to Disturb or destroy an archaeological site or relic listed on the VHI under Section 124.
- Under Section 123 of the Act it is an offence to damage or disturb sites in Victoria regardless of their inclusion on the VHI.

3.2 Local Council Planning Scheme

Places of heritage significance to a locality can be protected by a Heritage Overlay. Heritage Overlays are contained within local council planning schemes and assist in protecting the heritage of an LGA. The governing legislation is the *Planning and Environment Act 1987*. Heritage Overlays include places of local significance as well as places included in the Victorian Heritage Register.

Heritage Overlay

- Heritage Overlays are established in accordance with Section 18 of the *Planning and Environment Act 1987*, which requires local governments to develop Planning Schemes.
- Under Clause 43 of the Planning Schemes a Permit is required for changes to heritage places included on the relevant local government's Schedule to the Heritage Overlay.
- Places included on the VHI and VHR can also be included on the HO.

The City of Kingston has developed a Schedule to the Heritage Overlay, which identifies places within their governing boundaries of cultural heritage significance at a local level.

3.3 National Heritage List

The National Heritage List is administered by the Australian Government's Department of the Environment and Energy. It lists places of outstanding heritage significance to Australia. It includes natural, historic and Aboriginal places that are of outstanding national heritage value to the Australian nation. Places on the list are protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), which requires that approval be obtained before any action takes place that could have a significant impact on the national heritage values of a listed place.

3.4 Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) details provisions for the protection of Aboriginal and non-Aboriginal cultural heritage places with national heritage value. Places protected under the Act are registered on the National Heritage List, Commonwealth Heritage List or the World Heritage List and include natural, historic and Aboriginal places of outstanding heritage value.

4.0 Methodology

As outlined in the Ministerial Guidelines for Assessment of Environmental Effects (2006) and the Scoping Requirements for the Mordialloc Bypass Project EES (2018), a risk-based approach was adopted for the EES studies to direct a greater level of effort at investigating matters that pose relatively higher risk of adverse environmental effects. The following definitions were adopted for the assessment:

- *Environmental impact*: is described as any change to the environment as a result of a project activities.
- *Environmental risk*: As defined by the Ministerial Guidelines for Assessment of Environmental Effects Under the Environment Effects Act 1978 (DSE, 2006), “*Environmental risk reflects the potential for negative change, injury or loss with respect to environmental assets*”.

The purpose of the risk assessment was to provide a systematic approach to identifying and assessing the environmental risks, including heritage, cultural, social, health, safety and economic aspects as a result of the project. It articulates the likelihood of an incident with environmental effects occurring and the consequential impact to the environment.

The impact assessment and risk assessment processes were integrated throughout the development of the EES. The environmental risk assessment (ERA) process allowed the project team to identify as many environmental risks as a result of the project as possible and refine and target impact assessments accordingly. The impact assessments ensured the project team has a robust understanding of the nature and significance of impacts and the mitigation measures developed to minimise and control those impacts.

The risk and impact assessment processes were essential components of the project design process and in the formulation of construction and additional mitigation measures to minimise environmental impacts. These assessments also underpin the establishment of the Environmental Performance Requirements (EPRs), which set out the desired environmental outcomes for the project.

The below methodology was developed to assess the potential impacts of the Mordialloc Bypass on historical cultural heritage and sets out the process, methods and tools used to complete the impact and risk assessments.

4.1 Desktop Assessment

This section outlines the aims, methods and results of the desktop assessment. The aims of the desktop assessment were threefold:

- To provide a brief historical background and land use history for the study area;
- To determine the presence of additional historical (non-Aboriginal) heritage places within the study area by conducting a search of the following listings: Victorian Heritage Register (VHR), Victorian Heritage Inventory (VHI), Heritage Overlay (HO), National Heritage List (NHL), Commonwealth Heritage List (CHL) and World Heritage List (WHL); and
- To determine locations within the study area that have the potential to contain historical archaeological features and/or deposits.

In order to adequately assess the historical land use of the study area, the desktop assessment provides a review of an existing study⁴ and historical resources (e.g. aerial imagery and survey plans).

4.2 Archaeological Assessment

This section outlines the methods and results of the archaeological survey. The aims of the archaeological assessment were twofold:

- To determine the presence and extent of variable levels of archaeological site preservation (e.g. features and/or deposits) across the study area, by methodically examining remnant features via a combination of systematic pedestrian and opportunistic vehicular survey; and
- To determine the study area's overall archaeological potential.

The field survey methodology consisted of a broad visual assessment of the landscape based on a pedestrian and vehicular survey of the study area. The survey aimed to establish the archaeological potential (low-high) across the study area in areas outlined by the desktop assessment (see Section 2). Archaeological potential is based largely on the determination of landscape integrity and archaeological imprint. These classifications are further outlined below:

- *Landscape Integrity* – this variable reflects the general type and extent of post-depositional processes in the landscape, and their potential for preserving archaeological deposits. These consist of a range of natural and anthropogenic activities, including erosion, sedimentary deposition, land development and agriculture. These activities have the potential to either destroy, modify or obscure archaeological features. The extent to which these processes affect the identification or survival of an archaeological feature is determined by its archaeological imprint.
- *Archaeological Imprint* – this variable reflects the durability and obtrusiveness of archaeological features (AFs), and the relative extent to which they retain structure given post-depositional processes. This has been based on historical documentation for the materials used in building construction (e.g. stone, brick, timber, bark or galvanised iron clad), as well as any physical evidence for the feature visible on the ground today (e.g. footings). If known, the intensity of occupation could also be used as qualifying variable (e.g. where a site is used for an extended period for an activity that results in an extensive build-up of archaeological deposits).

See below, Section 5 for more detail on the assessment methodology.

4.3 Risk Assessment Methodology

The risk assessment is a critical part of the EES process as it guided the level and extent of impact assessment work required and facilitated a consistent approach to risk assessment across the various technical disciplines. The risk assessment process was based on the approach defined in *ISO 31000:2018 Risk Management – Principles and Guidelines*, which describes an environmental risk management process which is iterative and supported by ongoing communication and consultation with project stakeholders. The ERA process incorporated VicRoads key risk management requirements, specifically from the VicRoads Environmental Risk Management Guidelines (2012) and the VicRoads Environmental Sustainability Toolkit (2017).

⁴ CHMP 15026. Murphy and Rymer *in prep*.

4.3.1 Scope and boundaries

The ERA assessed all project phases, namely: Initial Phase (the current approvals and concept design stage); Construction Phase; and Operations and maintenance Phase. The risk process evaluated environmental risks that would result from the development of the project based on the concept designs for the project, the draft construction methodology and the existing conditions of the study area, as well as the draft environmental impact assessment reports which were in development during the ERA.

4.3.2 Risk Identification

To effectively and comprehensively recognise all potential environmental risks that may result from the project, it was necessary to identify impact pathways for all project activities during all its project phases. An impact pathway is the cause and effect pathway or causal relationship that exists between a project activity and an asset, value or use of the environment

Environmental impact pathways were identified under two categories:

- Primary environmental impacts: The impacts to environmental values that are directly attributable to project activities within a cause and effect paradigm. Project activities cause environmental impacts (effects) on environmental values through an environmental impact pathway such as construction activities. The assessment of these impacts and their associated risks assumes that all standard mitigation measures are in place and working as intended.
- Cumulative impacts: The potential cumulative impacts to environmental values that may result from the implementation of the project. This allowed for the identification of:
 - Secondary environmental risks which may result from the implementation of a risk response in mitigating a primary environmental risk;
 - On-site aggregate risks resulting from multiple on-site project activities on an environmental asset (risks were assessed in two ways, as a single project phase and as a whole project risk);
- Off-site cumulative environmental risks which accounted for potential off-site cumulative impacts of the Mordialloc Bypass project in conjunction with surrounding off-site projects in the local area.

4.3.3 Risk Analysis

With risks identified for each discipline, VicRoads and industry best practice and standard mitigation controls that are considered intrinsic to a project of this nature were identified, including requirements under relevant sections of the VicRoads Standard Specifications, EPA guidelines and Government environmental management policies.

4.3.4 Risk Evaluation

The ERA process developed for the project is based on the risk analysis matrix used on recent and similar VicRoads projects, as presented in Table 3. It follows the standard industry semi-quantitative risk analysis methodology that utilises pre-defined consequence and likelihood criteria as the factors to arrive at a risk rating.

Table 3: Risk Assessment Matrix

CONSEQUENCE		LIKELIHOOD				
		Rare	Unlikely	Possible	Likely	Almost Certain
		A	B	C	D	E
Catastrophic	5	Medium	High	High	Extreme	Extreme
Major	4	Medium	Medium	High	High	Extreme
Moderate	3	Low	Medium	Medium	High	High
Minor	2	Negligible	Low	Low	Medium	Medium
Insignificant	1	Negligible	Negligible	Negligible	Low	Low

Based on the project objectives and context, a set of project-specific and appropriate likelihood and consequence criteria were developed in consultation with VicRoads, the TRG and technical specialists Table 4.

Table 4: Risk Assessment Likelihood Categories

LIKELIHOOD				
Less than once in 12 months OR 5% chance of recurrence during course of the contract	Once to twice in 12 months OR 10% chance of recurrence during course of the contract	3 to 4 times in 12 months OR 30% chance of recurrence during course of the contract	5 to 6 times in 12 months OR 50% chance of recurrence during course of the contract	More than 6 times in 12 months OR 100% chance of recurrence during course of the contract
The event may occur only in exceptional circumstances	The event could occur but is not expected	The event could occur	The event will probably occur in most circumstances	The event is expected to occur in most circumstances
It has not happened in Victoria but has occurred on other road projects in Australia.	It has not happened in the greater Melbourne region but has occurred on other road projects in Victoria	It has happened in the greater Melbourne region	It has happened on an road project in the region in the last 5 years	It has happened on a road project of similar size and nature in the region within the last 2 years. OR It has happened multiple times on a road project in the region within the last 5 years.
Rare	Unlikely	Possible	Likely	Almost Certain
A	B	C	D	E

Table 5: Historical Cultural Heritage Environmental Risk Assessment Consequences Descriptors

Consequence Descriptors				
Insignificant	Minor	Moderate	Major	Catastrophic
Negligible impact to heritage sites Sites remain intact of unaffected	Disturbance or partial removal of a small number of locally significant heritage features or sites (HHO or DELWP local listing)	Complete removal of one or more locally significant heritage features or sites confined to a small number of locations	Complete removal of many locally significant heritage features or sites across many locations; and/or Disturbance of a heritage site of State or national significance	Widespread removal of heritage features or sites across the regions; and/or Destruction of a heritage site of State or national significance

For all risks rated medium, high or extreme in the initial risk rating, technical specialists were required to identify additional controls which could be implemented to further reduce risk and to perform the residual risk rating. Additional controls specify management measures over and above those considered as Standard Controls to ensure the residual risk has been effectively avoided or mitigated to as low as reasonably practicable.

Where risks could not be eliminated or sufficiently reduced (e.g. by engineering controls or re-design), these will typically be addressed by specific conditions in a site Environmental Management Plan (EMP), or be the subject of a separate management plan, including adaptive management plans based on ongoing studies or monitoring.

4.3.5 Environmental Performance Requirements

Following the evaluation of risk and through consultation with VicRoads, EPR's were developed to define, relevant, achievable and measurable environmental outcomes for the project. The mitigation measures identified during the risk assessment process were used to inform the EPRs and also specify the means by which the EPRs are to be satisfied. The EPRs to historical cultural heritage are outlined in the table below and set out the desired environmental outcomes for the project. The EPRs are applicable to all project phases and provide certainty regarding the project's environmental performance (Table 12).

4.4 Impact Assessment Methodology

This study has assessed the potential historical cultural heritage impacts during construction of the project on assets and values to be protected.

The impact assessment included the following:

- Review of the project
- Identifying impacts on historical cultural heritage

- Identifying EPRs to define the outcomes to be achieved to avoid, minimise or mitigate impacts.

An impact assessment was undertaken for all places where it was considered there would be the potential for an impact associated with the project.

5.0 Existing Conditions

5.1 Desktop Assessment - Method of Assessment

This section outlines the aims, methods and results of the desktop assessment. The aims of the desktop assessment were threefold:

- To provide a brief historical background and land use history for the study area.
- To determine the presence of additional historical (non-Aboriginal) heritage places within the study area by conducting a search of the following listings: Victorian Heritage Register (VHR), Victorian Heritage Inventory (VHI), Heritage Overlay (HO), National Heritage List (NHL), Commonwealth Heritage List (CHL) and World Heritage List (WHL).
- To determine locations within the study area that have the potential to contain historical archaeological features and/or deposits.

In order to adequately assess the historical land use of the study area, the desktop assessment provides a review of an existing study⁵ and historical resources (e.g. aerial imagery and survey plans).

5.2 General Land Use History

The following explores the broader historical context of the geographical region in which the study area is situated. This includes a review of prior research and heritage assessments, through which previous land use activities are explored.

In 1802, the first Europeans to travel through the region included the surveyor Charles Grimes and party.⁶ The first squatters followed in the 1830s, whom settled in the Carrum Carrum Swamp area in 1837 (McGuire 1965b:11). During this period, land preparation in the form of vegetation clearance commenced and intensified over time as indicated by a number of land subdivisions and pastoral runs which are recorded from the c. 1840s (under squatter's licenses). Several notable runs include Balleymarong station (c. 1840), and Mordialloc Station No. 1 (also known as Keys Run, c. 1848) and No. 2 (c. 1842), which are located nearby to the current study area (Spreadborough and Anderson 1983:262 and 272).

Parts of the area were eventually leased for specialised farming and market gardening purposes, particularly during the summer season in the 1850s and coinciding with the Gold Rush period (McGuire 1965a:1). The first land sales in the region occurred in December 1865, during which time the landscape was described by early settlers as dense in vegetation; consisting of tea-tree, gum trees and wildflowers. In c. 1870, Hugh Brown (market gardener and orchardist), reported that wild cattle also occupied the surrounding scrub land (McGuire 1965a:1).

The first settlements were situated near the already-established township of Mordialloc, through which coaches ran four times daily between Melbourne and Frankston (McGuire 1965a:3). Early transport in the area was by coach or cart, with a regular service running from Mornington, through Mordialloc to Melbourne by 1865 (Sheehy 1970:28-9); while carts transporting fish from the Mornington Peninsula to the city also took passengers, as early as the 1850s (Sheehy 1970:21). The

⁵ CHMP 15026. Murphy and Rymer *in prep.*

⁶ A secondary land survey was undertaken by T. E. Rawlinson (Carrum Swamp) in 1866.

railway to Frankston was completed in 1882, and Aspendale railway station was opened in 1897 followed by Chelsea station in 1907 (McGuire 1965a:12).

However, as reported by settler Mark Young (c. 1872) amongst others, significant water-logging issues plagued the general area, which was problematic in so far as cultivation was often unsuccessful and residency impossible for many selectors. Young noted such conditions encountered on his 176-acre property:

“Some of my family were often in the habit of walking all the distance with the water above our knees carrying our weeks provisions with us” (Young c. 1872 in McGuire 1965a).

Drainage of the nearby Carrum Swamp, particularly around Aspendale, was a major issue. In the 1880s, a scheme was designed by the Lands department to reclaim the swamp by constructing two main channels to carry the waters of the Eumemmerring and Dandenong Creeks across the swamp and out to the Mordialloc and Kananook Creeks. This included provisions for the Patterson cut (currently known as the Patterson River), which was completed in 1879. Due to inadequacies in the scheme, the Mordialloc Creek was later remodelled in the mid-20th Century, and included channelisation, dredging, elevation of banks and artificial levees (Murphy and Rymer *in prep.*:36). These drainage and flood protection works significantly altered the surrounding landscape.

In subsequent years, the region continued to expand as a result of alterations to the hydrology of the landscape and urbanisation, which saw an increase in residential subdivisions, pastoral leases and market gardens, but also commercial and industrial enterprises and infrastructural upgrades (e.g. construction of roads and railways, and utility installations etc.). Industrial enterprises include the Braeside Sewage Treatment Plant (c. 1939) and sandmining ventures. Sandmining took advantage of the remnant dune fields present within the region (e.g. Old Dandenong Road sand quarry) and were extensively mined from the c. 1930s. Mined areas were later repurposed as landfill sites (c. 1970) (e.g. Tootal Road landfill) (Murphy and Rymer *in prep.*:35).

An intensive study of land use activities within the study area was also undertaken as part of the Cultural Heritage Management Plan (CHMP 15026; Murphy and Rymer *in prep.*). The results of the assessment are summarised in Table 6, which details various land use activities across the study area from mid-20th century, extrapolated from aerial and Lidar imagery (Murphy and Rymer *in prep.*:36-37). These results are further illustrated in Appendix 1.

Overall, the study area has demonstrated varied land use activities of which include:

- Vegetation clearance and land preparation for the pastoral and agricultural purposes (e.g. ploughing, animal husbandry, market gardens);
- Modifications to the hydrology of the region (e.g. Carrum Carrum Swamp, Mordialloc Creek, artificial wetlands);
- Development of commercial and industrial enterprises (e.g. Sandmining, Sewage Treatment Plant); and
- Construction and upgrades to road, rail and utility infrastructure.

Table 6: Land use activities across the study area (as per CHMP 15026, Murphy and Rymer *in prep.*:36-37)

Section of Study Area	Period	Land Use Activity
Dingley Bypass to Old Dandenong Road	1951	Cleared vegetation, crop farming, market gardening and vacant land. Grange Road is unsealed during this period.
	1960-61	Commercial activity (northeast), landfill and/or quarry (central area; Lot 2, Grange Road).
	1981-85	Expansion of landfill and/or quarry.
	1990-91	Construction of greenhouses in market gardens.
	2005	Cessation of landfill and/or quarrying activities. Construction of structures, including a soil processing facility (Enviromix).
	2016	Construction of Dingley Bypass.
Old Dandenong Road to south of Centre Dandenong Road	1951	Cleared vegetation bar mature trees (south), and crop farming. Provisions for a drain (western boundary). Old Dandenong Road is unsealed, and Centre Dandenong Road comprises two lanes during this period.
	1974	Presence of farm structures between Old Dandenong Road and Centre Dandenong Road (possible market gardens or greenhouses).
	1990-91	Crop farming, market gardens and greenhouses (north).
	2005	Partial removal of farm structures/greenhouses between Old Dandenong Road and Centre Dandenong Road, removal of mature trees (south). Commercial development south of Centre Dandenong Road.
	2009	Removal of remaining farm structures/greenhouses.
	2016	Cessation of commercial activity (south).
North and South of Lower Dandenong Road	1951	Cleared vegetation and crop farming. Presence of horse training track (northern boundary).
	1974	Commercial activity north of Lower Dandenong Road. Large-scale earthworks/development (south-east).
	1981-85	Removal of commercial structures north of Lower Dandenong Road.
	1990-91	Cessation of large-scale earthworks/development (south-east).
	2005	Upgrade of Lower Dandenong Road comprising a dual carriageway (north of existing road). Construction of Woodlands Drive allowing access to commercial precinct (south).
Braeside Treatment Plant and Land to the North	1951	Cleared vegetation, isolated mature vegetation (south) and crop farming. Possible sand drifts (centre). Braeside Treatment Plant works (south of Plant).
	1961-66	Presence of silos, ponds and dams associated with the Braeside Treatment Plant (south). Earthworks associated with Plant ponds (along eastern boundary).
	2005	Removal of the Braeside Treatment Plant infrastructure. Plant ponds backfilled.
	2016	No change.
Governor Road and Land to the North and South	1951	Cleared vegetation and crop farming. Governor Road is unsealed during this period.
	1961-66	Presence of Braeside Treatment Plant ponds (north).
	1974	Presence of Braeside Treatment Plant ponds (extended to the south).
	1982	Braeside Treatment Plant ponds appear dry or backfilled. Possible drainage works to the south of Governor Road.
	2005	Removal of the Braeside Treatment Plant infrastructure. Plant ponds backfilled. Presence of a structure south of Governor Road. Construction of drain associated with the artificial wetlands (east and west).
Mordialloc Creek	1951	Cleared vegetation bar edges of a sandy rise/sand sheet north of Mordialloc Creek. Mordialloc Creek has been channelised by this period.
	1961-66	Presence of minor earthworks (linear) north of Mordialloc Creek.

Section of Study Area	Period	Land Use Activity
	1974	Underground infrastructure installed north of Mordialloc Creek.
	1985	Clearance of vegetation and levelling of sandy rise/sand sheet. Construction of a circular dam[?] and drain (north).
	1990	Additional drainage constructed (north). Presence of an unsealed track on both sides of the Mordialloc Creek.
	2005	Construction of artificial wetlands north of the Mordialloc Creek (east and west of the study area). Construction of a drain, connecting the wetlands (south). Presence of a small dam, unsealed track crossing the wetlands (along the eastern boundary) (south).
	2009	Dam backfilled.
	2016	Presence of Bowen Parkway and pathway (sealed), which crosses the site.
Northwest of Springvale Road	1951	Cleared vegetation, vacant farmland.
	1974	Upgrade of Springvale comprising a dual carriageway. Ploughing in northern paddock.
	2009	Paddocks with weed overgrowth (patchy) and presence of a truck parking area along western boundary.
	2016	Residential properties (rear boundaries) encroach into the site (north).
Southeast of Springvale Road	1951	Cleared vegetation with vacant farmland. Residential allotments front onto Springvale Road. Exotic trees planted in rows.
	1985	Presence of the Mornington Peninsula Freeway. Residential allotments removed.

5.4 Historical Heritage Places within the Study Area

5.4.1 Historical Heritage Register Search Results

Historical heritage register searches were conducted on 14 February 2018 to determine if the study area overlaps with the following historical heritage registrations:

- Victorian Heritage Register (VHR) - no listings present in the study area, however **one (1)** listing located adjacent to study area (Table 5).
- Victorian Heritage Inventory (VHI) – no listings present in the study area.
- Heritage Overlay (HO) – **two (2)** listing recorded by the Kingston Planning Scheme (Table 7).
- National Heritage List (NHL) – no listings present in the study area.
- Commonwealth Heritage List (CHL) – no listings present in the study area.
- World Heritage List (WHL) – no listings present in the study area.

The study area intersects with a single Heritage Overlay (HO) site being the ‘Braeside Park Precinct’ (HO104). This site comprises of two components including a settling pond (north) and Melbourne Metropolitan Board of Works (MMBW) buildings and equipment (south). Specifically, the study area intersects with the southern component. The Braeside Park is of historical and technological significance at a local level.

Upon review of the Kingston Heritage Study and through correspondence with Heritage Victoria, it was determined that the current mapped extent of HO104 (southern component) is inaccurately represented by the Kingston Planning Scheme.⁷ The place extent will need to be revised to more-

⁷ Based on the review of the Kingstone Heritage Study and correspondence with Heritage Victoria.

accurately reflect the location of the heritage place. This may require the input of a built heritage specialist.

In addition, a Victorian Heritage Register (VHR) site the 'Former Christ Church of England (H0225, also HO3) is located immediately adjacent, but not within, the study area at the intersection of Old Dandenong and Centre Dandenong Roads (Map 3).

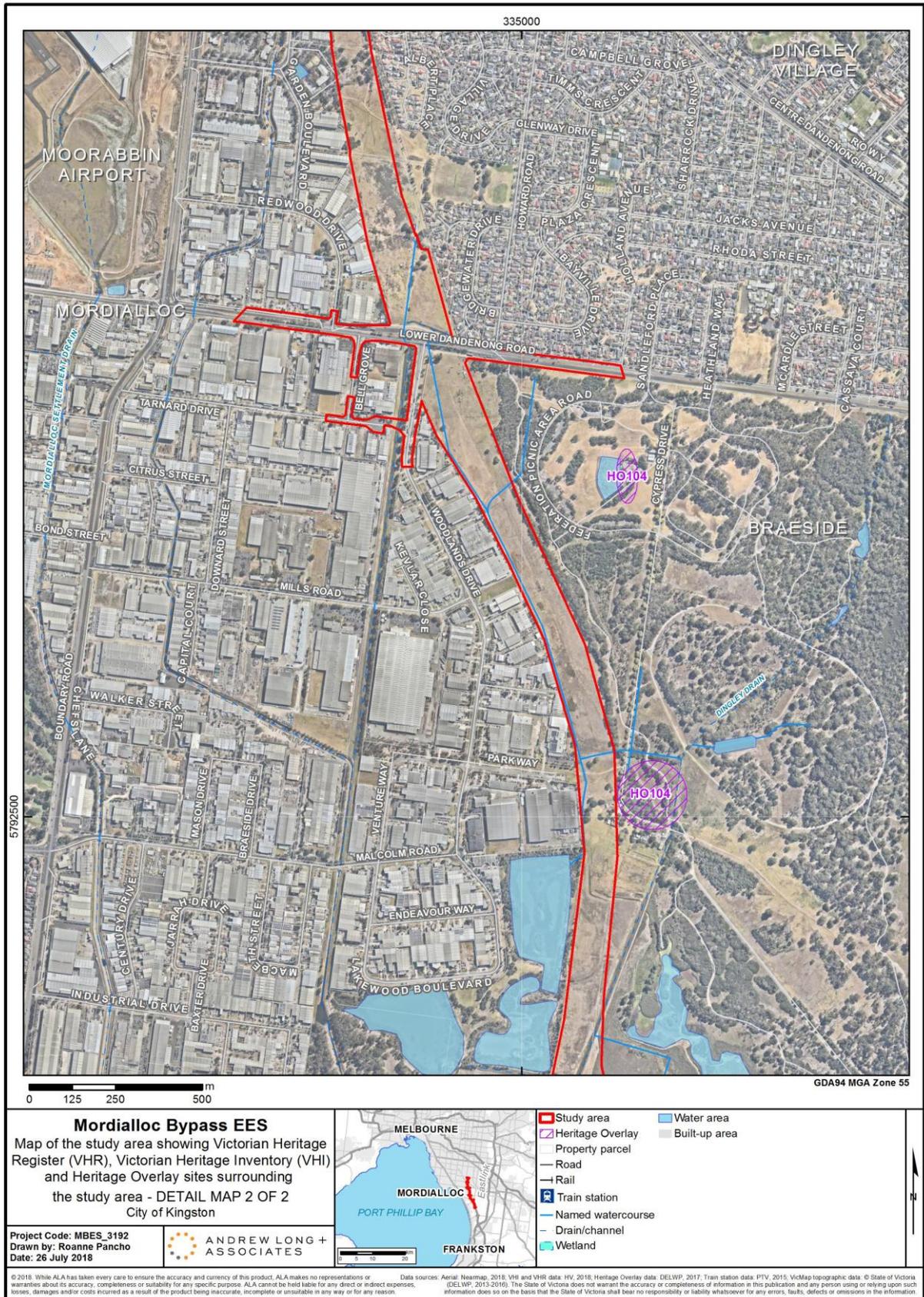
Table 7: Victorian Heritage Overlay in the study area (14 February 2018)

Local Government Authority	Heritage Overlay Identifier	Description
Kingston City Council	HO104	Braeside Park Precinct – remnant MMBW equipment
Kingston City Council	HO3 (also VHR H0225)	Christ Church 387-405 Old Dandenong Road (cnr Centre Dandenong Road), Dingley

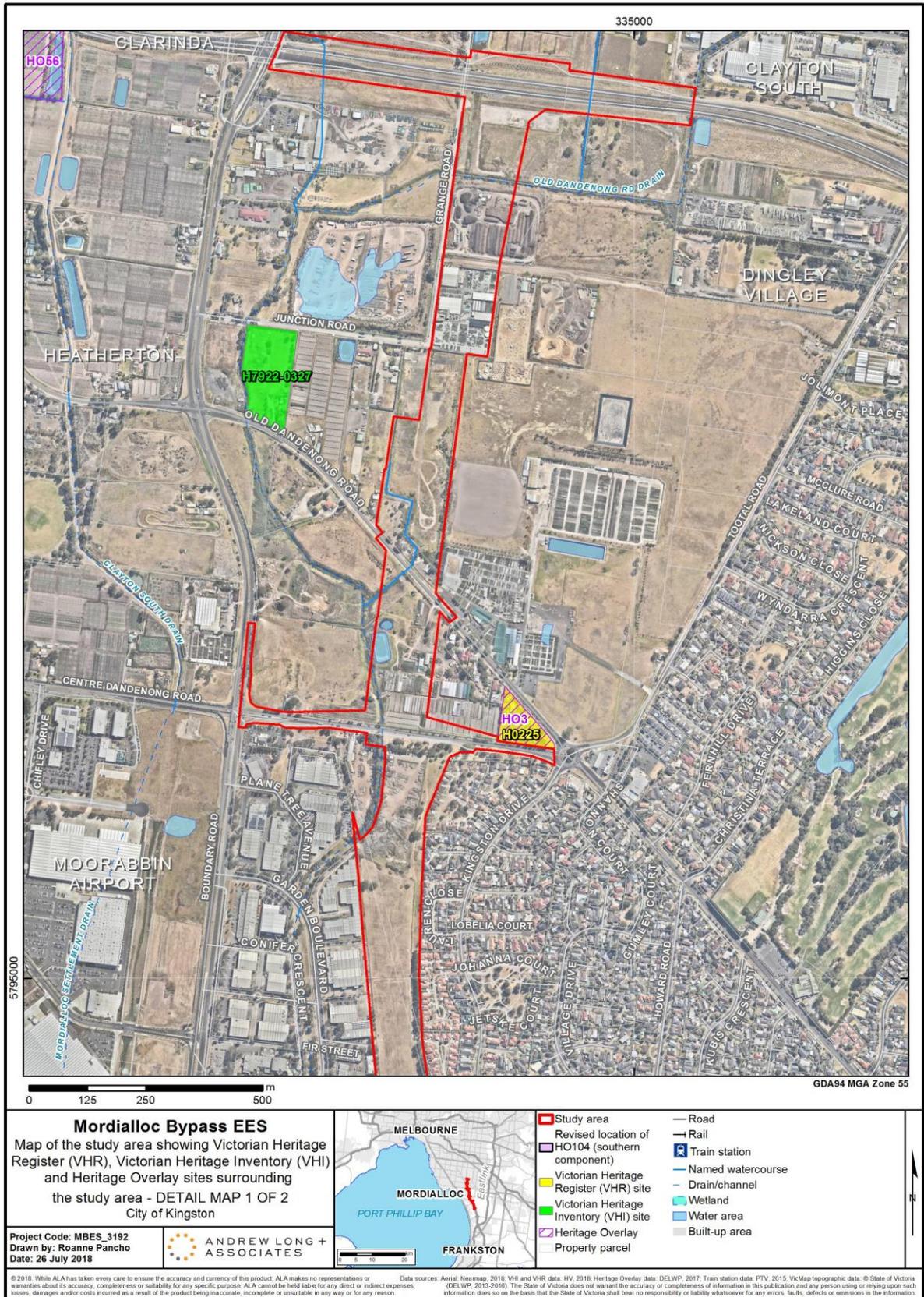
Table 8: Historic cultural heritage sites within 200 m of the study area (14 February 2018)

Register/site type	Identifier	Description
Victorian Heritage Register	VHR H0225 (also HO3)	Christ Church

The search did not identify any additional historical sites within the study area, nor within 200 m of the study area.



Map 2: Heritage Places within the study area



Map 3: Heritage Places in proximity to study area (sites not listed in Table 8 are beyond 200 m of the study area)

5.4.2 Historical Heritage Places within the Study Area

The following reviews the historical context and significance of the identified historical sites within the study area.

5.4.2.1 Braeside Park Precinct (HO104)⁸

The Braeside Park Precinct retains historical elements which relate to the site's early history as a pastoral property, racetrack and *Melbourne Metropolitan Board of Works* (MMBW) sewage treatment plant (Braeside Sewage Treatment Plant). The wider area relevant to the study area reflects the use of the Precinct for the purposes of sewage treatment. Overall, the Braeside Park Precinct contains several sewage treatment plant elements outside the current study area of which include settling basin and substation, and elements within the study area including administration buildings, that are of historical and some technological significance. Given the overall use of the site by plant facilities, there is a potential for previously unidentified Sewage Treatment Plant equipment to exist within the current study area, which will be addressed as part of the archaeological survey (see Section 3).

European Settlement

Europeans first settled the general area in 1840 (Michael Solomon and family). Solomon held a squatting license for a large portion of land, which included the current Braeside Park area, although at the time was utilised as a pastoral run. After Solomon became insolvent in 1842, Charles and James Lomax Beswicke acquired sections of the run (inclusive of Braeside Park) for two years, and in 1844 acquired by George Keys. New laws in 1851 saw the revocation of squatting licenses and Keys subsequently purchased Lots 1 and 2 of Section 21 and Lot 2 of Section 22.3. The Keys were regarded as being highly influential for owning transits of land from the Carrum Carrum Swamp to Brighton, and Robert Keys for his ownership of the Exchange Hotel at Cheltenham and his activeness in local politics. Little is known in terms of land use from the period of occupation to its eventual sale to David Syme, owner of *The Age* newspaper (Lot 2 of Section 22) and his son Dr. Arthur Edward Syme, a surgeon (Lot 1 Section 21) in 1902 and 1915, respectively. It is known however, that the property of Lot 2 Section 21 was subdivided (four allotments) in 1900. Upon his father's death, Arthur acquired the entirety of the property. Two of four subdivided allotments were purchased by Frederick William Werrett who established market gardens across these locations.

Dr. Arthur Syme developed his land as a large racehorse training complex, with stables for 20 horses, quarters for his employees including a bungalow, bunkhouse and a shower house, and storage outbuildings and various unsealed sand and grass tracks. Syme's and Werrett's properties were eventually sold in 1928 to the Melbourne Metropolitan Board of Works for the construction of a sewage treatment plant.

Melbourne Metropolitan Board of Works ownership and construction of a sewage treatment plant

The *Melbourne Metropolitan Board of Works* established a sewage treatment plant in 1939 to service the southern and eastern suburbs of Melbourne and to ease the pressure on the Werribee sewage plant. However, in the interim years (1928-1939), the land was tenanted due to complications surrounding the plant's construction, the result of public protests and the Great Depression (1930s). During the interim period, Werrett leased the property he originally owned and sold to Harry Telford, a horse Trainer. Telford, alongside his employees, operated and maintained the racehorse complex. Telford is known to have trained Phar Lap on site prior to 1930/31. In 1940, Ernst John Willmot took over Telford's lease, relevant to the racehorse training complex, and was responsible for its various

⁸ The information provided has been derived from the Braeside Park Heritage Place Report authored by Bryce Raworth (2001) (for primary references cited see Appendix 2).

additions including Canadian cedar stables, water tanks (below and above ground), milking sheds, various buildings, and an extensive garden (e.g. fruit trees and ornamental plantations).

By 1939, the tenants were vacated, and construction of the sewage treatment plant commenced, however MMBW irrigation areas were leased for sheep grazing purposes. The construction was completed in 1940 and opened in the same year. The plant featured a series of concrete tanks, a pump house and lagoons to biologically treat the sewage, connected by a series of pipes. The sewage was filtered through crushed rock in the tanks before being purified (evaporated) from the lagoons. The purified effluent was irrigated into the surrounding MMBW land. The plant was expanded in 1950 and neighbourhood plants were constructed with the ability to service a populace of 60,000 (from 16,000). The plant operated for 35 years until 1975 when the sewers were diverted to Carrum sewage treatment plant, which eventually superseded the Braeside plant.⁹ The Braeside plant closed in 1980 and was subsequently decommissioned. In the years following, the land occupied by the plant was redeveloped as public park, which featured landscape features and protected natural areas. During this period the Keys residence was demolished, and the stables were destroyed in a fire (1982). The new Braeside Park was managed by a division of MMBW (Parks and Gardens), before the responsibilities were transferred to Parks Victoria, which continue to manage the park.

5.4.3 Historical Heritage Places within 200 m of the Study Area

The following briefly reviews the historical context and significance of the identified historical sites within 200 m, but not within, the study area.

5.4.3.1 Former Christ Church of England (H0225)

The Former Christ Church of England (H0225) is located at the corner of Centre and Old Dandenong Roads, Dingley Village, immediately adjacent to the study area. Christ Church was designed by architect Charles Webb and constructed 1872-73.¹⁰ The church was constructed at the behest of Miss Mary Attenborough, pioneer settler of Dingley. Mary, and her brother Thomas were devout members of the Church of England and were heavily active in civic affairs which included an extension of their religious beliefs to the community.¹¹ Christ Church was constructed as a result, comprising a simple four-bay rectangle plan, with a small porch, projecting apsidal chancel and detailed tower. The structure is described as having pointed brickwork with stucco mouldings, including quoins, a rose window, eaves brackets and window details (including memorials to the Attenboroughs) and has a slate roof with iron ridge decoration. Christ Church was officially opened and dedicated by the then Bishop of Melbourne, Bishop Perry on September 21, 1873 and has since facilitated religious services. In the 1960s the church was classified by the National Trust of Victoria as a building worthy of preservation for its historical value.

⁹ Kingston Historical Website – Sewage Treatment Plant at Braeside:
<http://localhistory.kingston.vic.gov.au/htm/article/407.htm> – accessed 19/02/2018.

¹⁰ Department of Environment and Energy – Australian Heritage Database Place details: Christ Church Anglican Church, Centre Dandenong Rd, Dingley Village, VIC, Australia: http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;search=state%3DVIC%3Blga_name%3Dkingston%3Blatitude_1dir%3DS%3Blongitude_1dir%3DE%3Blongitude_2dir%3DE%3Blatitude_2dir%3DS%3Bin_region%3Dpart%3Bkeyword_PD%3D0%3Bkeyword_SS%3D0%3Bkeyword_PH%3D0;place_id=5850 – accessed 19/02/2018.

¹¹ Kingstone Historical Website – The Attenboroughs: Pioneers of Dingley:
<http://localhistory.kingston.vic.gov.au/htm/article/76.htm> – accessed 22/02/2018.

5.6 Historical Archaeological Potential within the Study Area

The following discusses the historical archaeological potential identified within the study area as determined during the desktop assessment. The desktop assessment indicated various land use activities, including historical land uses which may be represented archaeologically. This section outlines the key areas of interest, which are to be investigated further as part of an archaeological survey (see Section 3) to determine the extent of existing heritage features within the study area.

The provisional archaeological potential rating and disturbance rating are based on a three-part scale of *low*, *moderate* and *high*. These ratings are relative to each other and have been consistently applied across the study area. The archaeological potential rating is an overview rating based on the results of the desktop assessment, and consideration of the broader region. The disturbance rating is an overview rating based on an assessment of aerial imagery and mapped data.

- *Archaeological Potential* – this variable reflects the distribution of locations within the study area that have the potential to create archaeological deposits. As such archaeological potential is an unrealised, latent form of sensitivity that defines the spatial extent of known historical activity sites. Given the types of primary sources available (e.g. maps and aerial photographs), these activity sites are generally architectural features such as buildings, though other less documented types may be present in the landscape. It may be found on further investigation that the influence of as yet undocumented factors will have negated the predicted archaeological potential (see Section 3).

The ratings are preliminary and high level in nature and represent an average value across a given area. For example, an area may be assigned a moderate (overall) provisional disturbance rating and yet have localised pockets of land within it that are intact with low disturbance or that have been subject to considerable or complete impacts. More detailed future investigations, where required and undertaken, will provide a higher resolution understanding of the archaeological potential and the level of disturbance of the study area.

5.6.1 Braeside Park Precinct (HO104)

Based on a review of the historical resources, assessment of land use history and current condition of the study area, it has been determined that there is a high potential for historical archaeological features to exist within the Braeside Park Precinct, of which relate to Sewage Treatment Plant infrastructure, and to a lesser degree, 19th century European pastoralism.

Archaeological features or deposits that may relate to the Braeside Sewage Treatment Plant are likely to exist at a sub-surface level. Such features may include infrastructure pertaining to sewer pipes and access pits (e.g. manholes). Whilst imperative to, and representative of the functions of the former plant, overall these features are considered to be of low archaeological significance and low research value. In contrast, the features considered to be moderately to highly significant at a local level include the red-brick Pump House (constructed of a 'Steamlined Modern style') and associated avenue of planted cyprus trees (c1930), red-brick chlorine store, pumping machinery, concrete tanks, and surveyors markings. Whilst most of these significant features occur beyond the boundary of the study area, the Pump House intersects with the study area.

Archaeological features or deposits that may relate to early European settlement (e.g. pastoral activities and market gardens), within HO104 are unlikely to have survived due to the construction of the plant and associated operations and an associated high level of disturbance (e.g. the installation of sewer pipes, treatment lagoon etc). As shown in Figure 1, the scale of of plant infrastructure and treatment areas constructed at a surface level is widespread. Therefore, the potential for archaeological remains of significance relating to the early European settlement of the general area (e.g. pastoral activities and market gardens), is considered low.

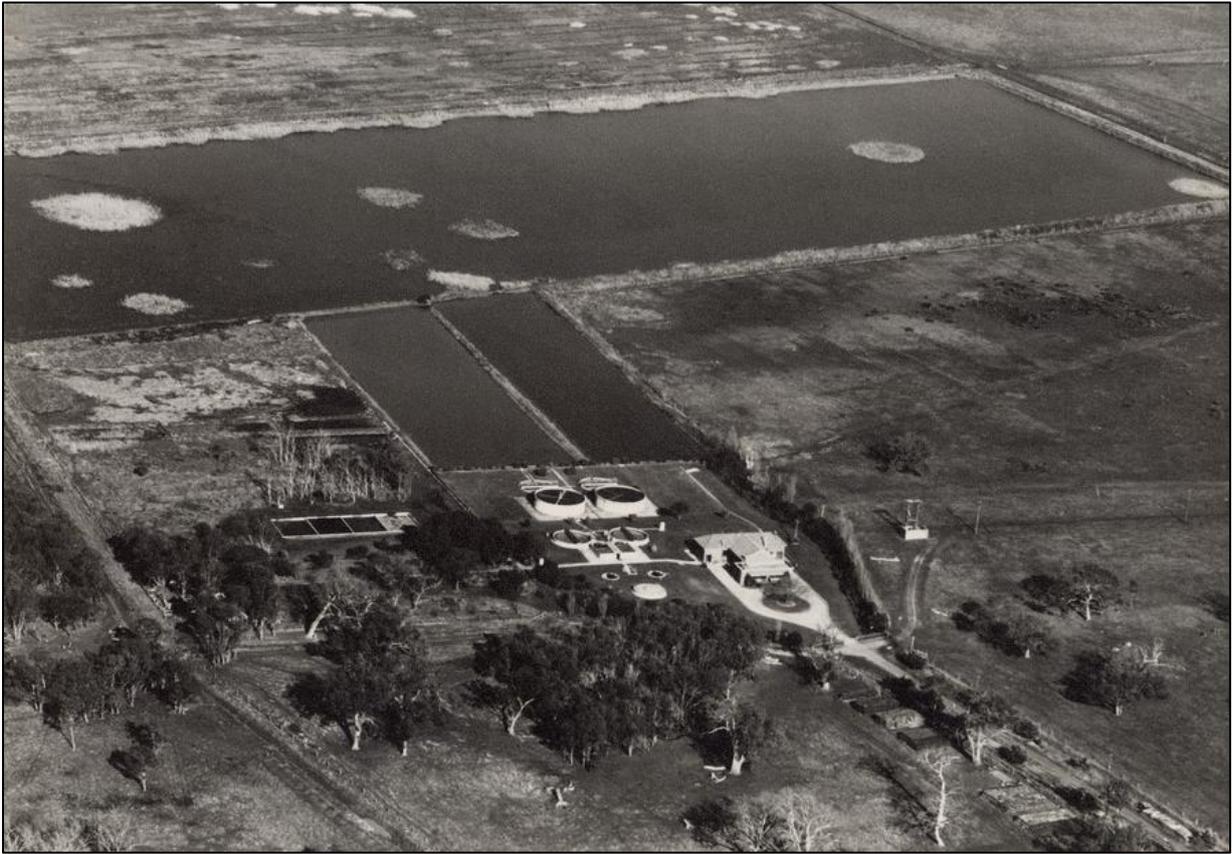


Figure 1: Aerial Photo of the Braeside Treatment Plant (c1955) (oriented south-west)¹²

¹² State Library of Victoria – Aerial photo of Braeside Treatment Plant:
http://search.slv.vic.gov.au/primo_library/libweb/action/dlDisplay.do?vid=MAIN&search_scope=default_scope&docId=SLV_VOYAGER2376833&fn=permalink – accessed 20/02/2018.

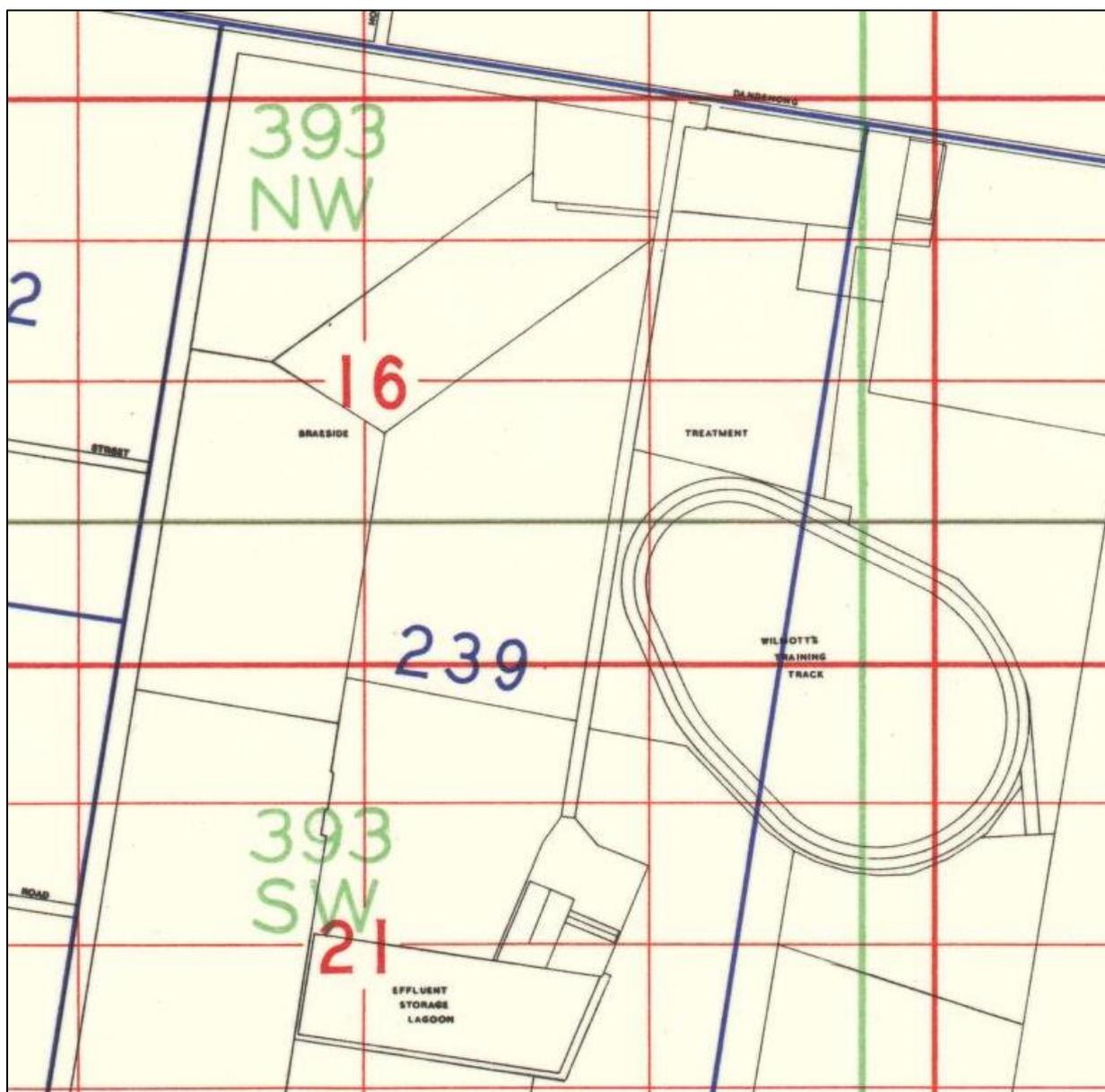


Figure 2: MMBW plan (c1960s) showing Braeside Sewage Treatment Plant (orientated north)¹³

5.6.2 European Pastoralism

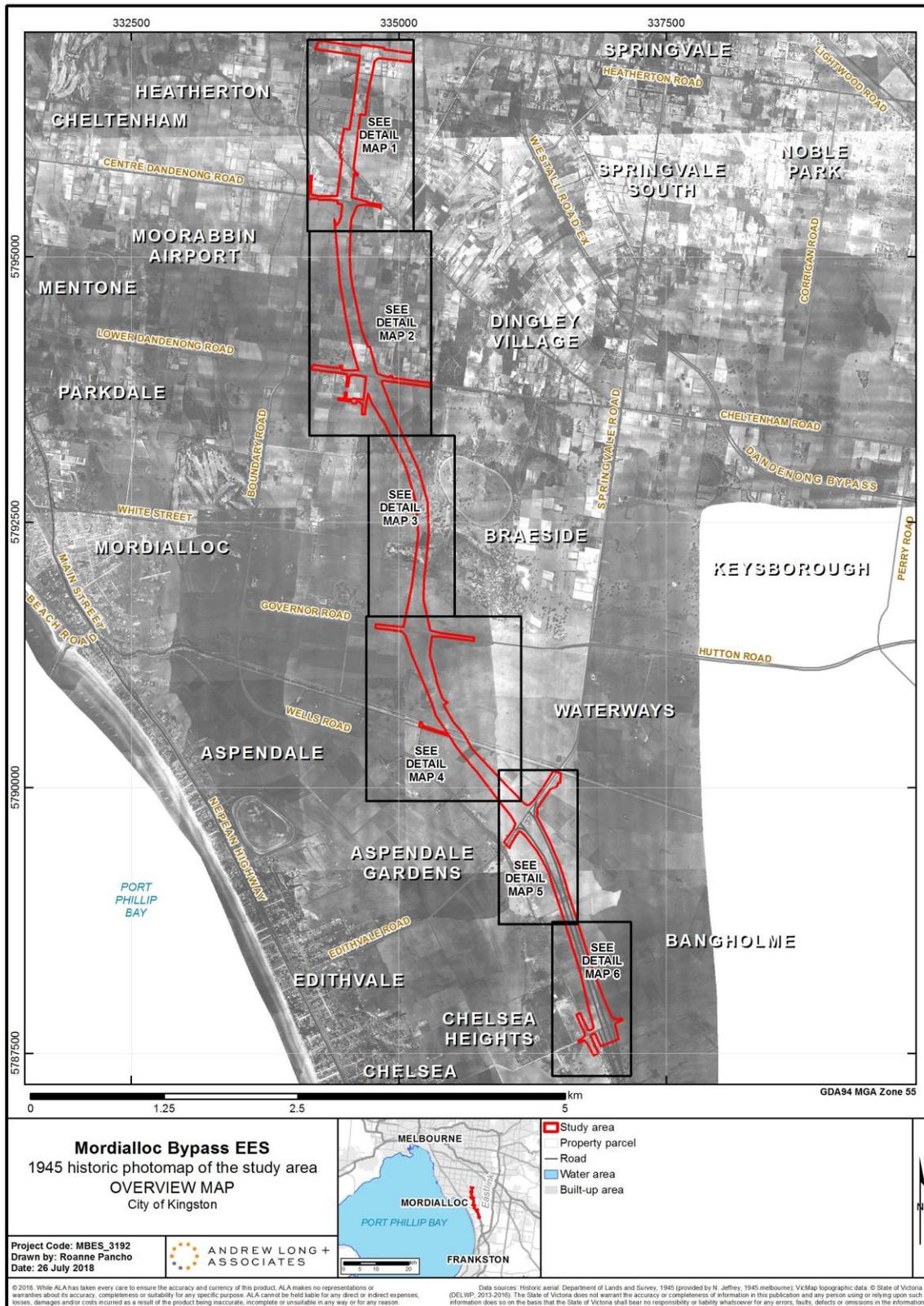
Based on a review of the historical resources, an assessment of land use history and the current condition of the study area, it has been determined that there is a low to moderate potential for historical archaeological features relating to the early European pastoralism of the general area (e.g. dwellings and market gardens) to be present within the current study area.

Whilst presently unknown, archaeological features or deposits that may relate to 19th century pastoral dwellings, domestic activities, or commercial activities associated with market gardens are likely to be identified at a surface level (e.g. structural foundations). If identified, these features may indicate the presence of stratified deposits at a sub-surface level. These features and/or deposits are

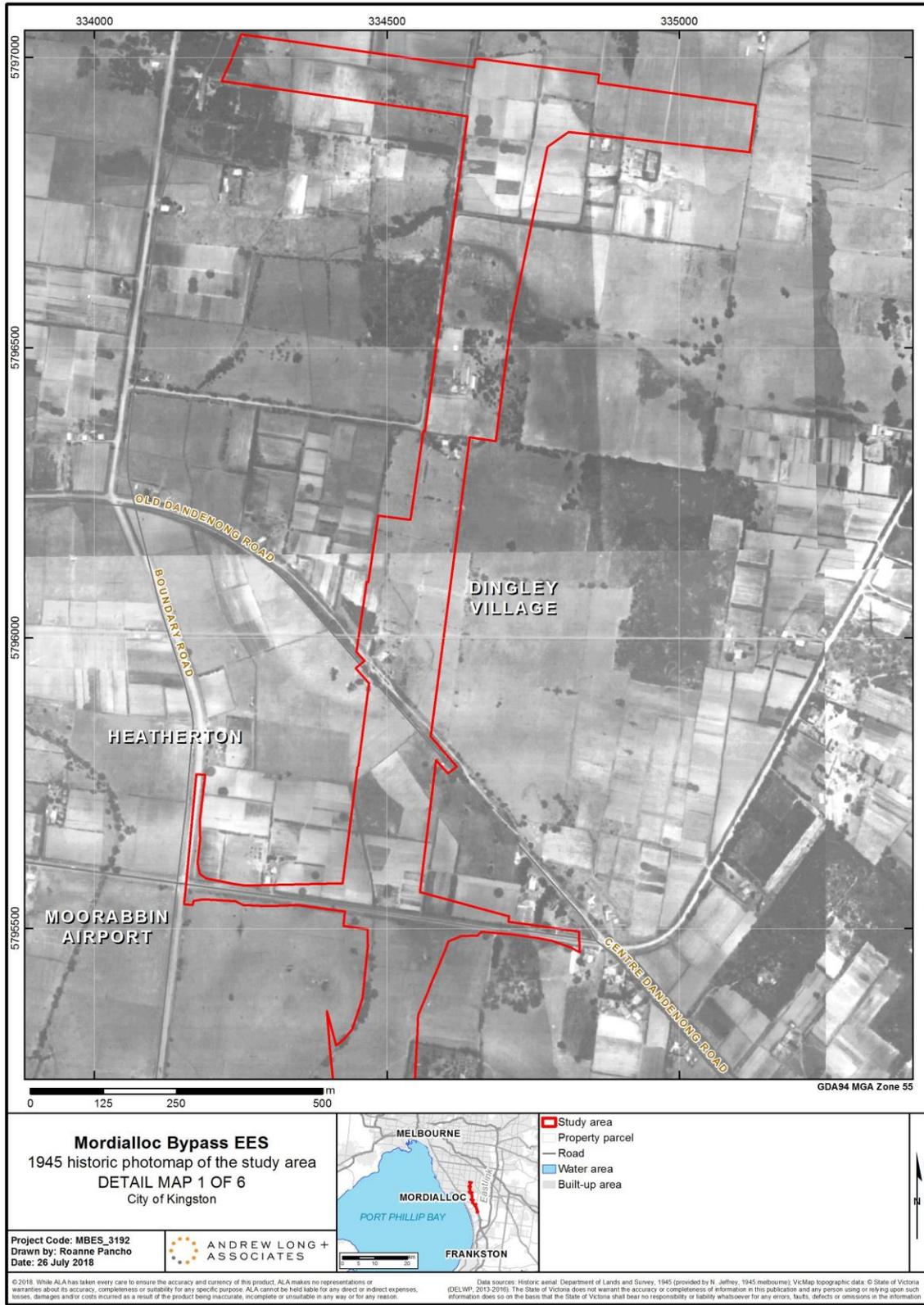
¹³ State Library of Victoria – Melbourne and Metropolitan Board of Works, scale 1600 feet to 1 inch [index plan]. 6G, Municipalities of Dandenong & Moorabbin: http://search.slv.vic.gov.au/primo_library/libweb/action/dlDisplay.do?vid=MAIN&search_scope=default_scope&docId=SLV_VOYAGER1158378&fn=permalink – accessed 20/02/2018.

less likely to occur in areas which have been highly developed (moderate to high level of ground disturbance). There is a greater potential for historical archaeological potential to exist in areas where modern development has been minimised (low level of ground disturbance), and in locations where historical aerial imagery indicates former structural features (Map 4 to Map 10). As per the outcomes of the desktop assessment and a review of historical mapping, it has been determined that the key areas of interest include the segment of the study area between Centre Dandenong Road and Governor Road, and the segment between the Mordialloc Creek and Springvale Road (see Section 3). Features and/or deposits, should they be identified, may be of an aesthetic, historical, scientific, social or spiritual significance at a local level (The Burra Charter 2013:2).¹⁴

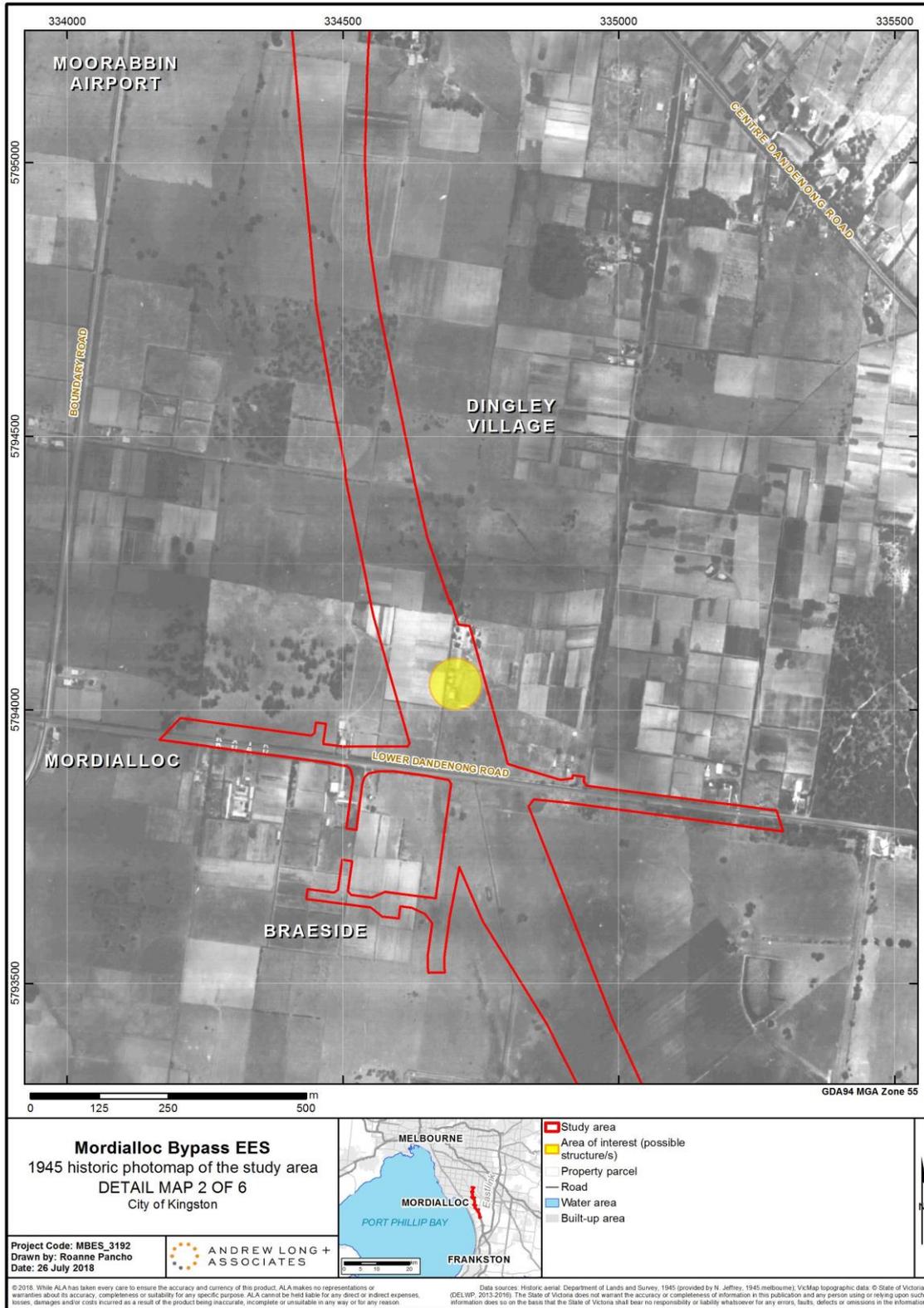
¹⁴ The Burra Charter – The Australia ICOMOS Chart for Place of Cultural Heritage Significance (2013): <http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf> – accessed 18/08/2016.



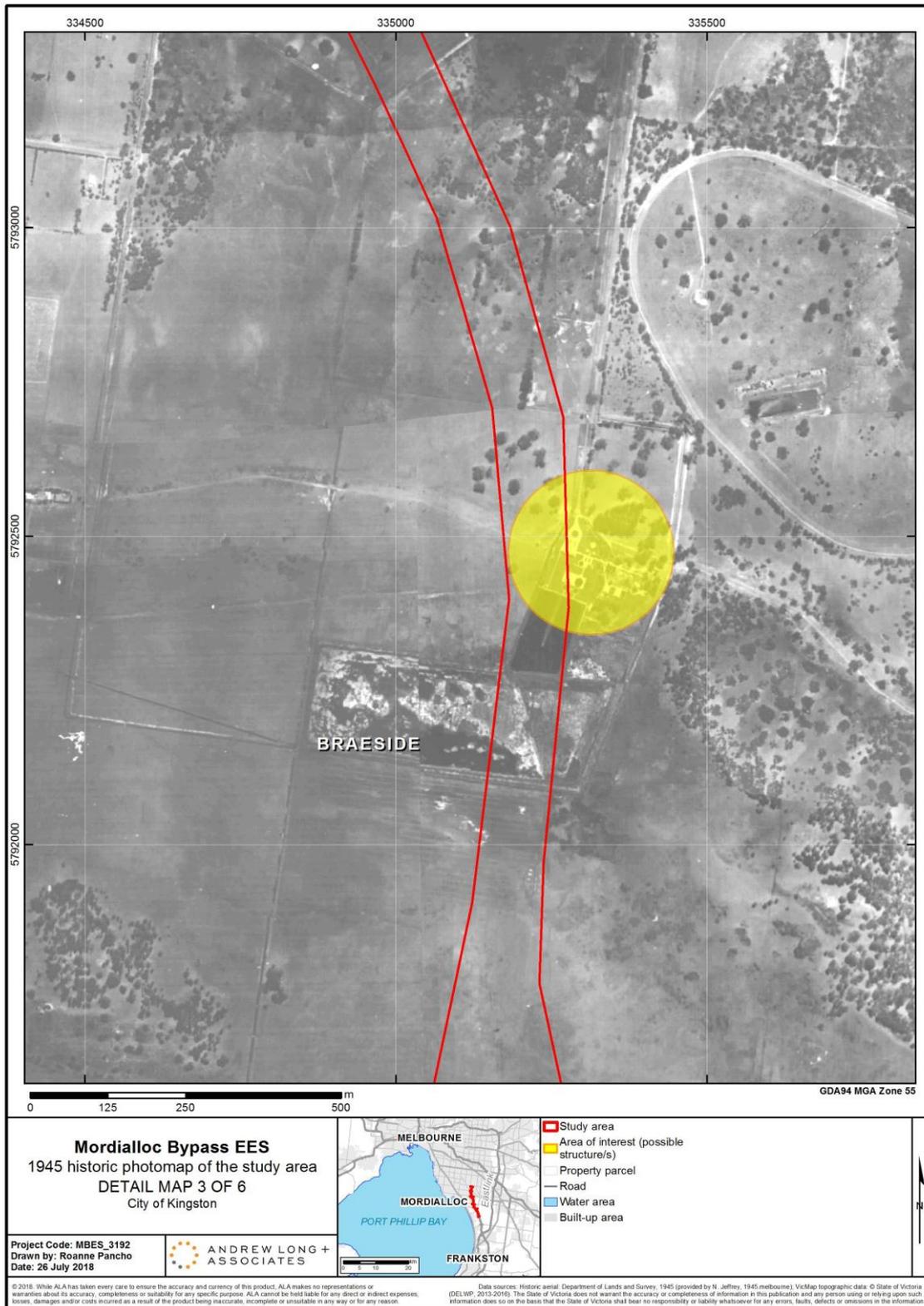
Map 4: 1945 historic photomaps showing the study area



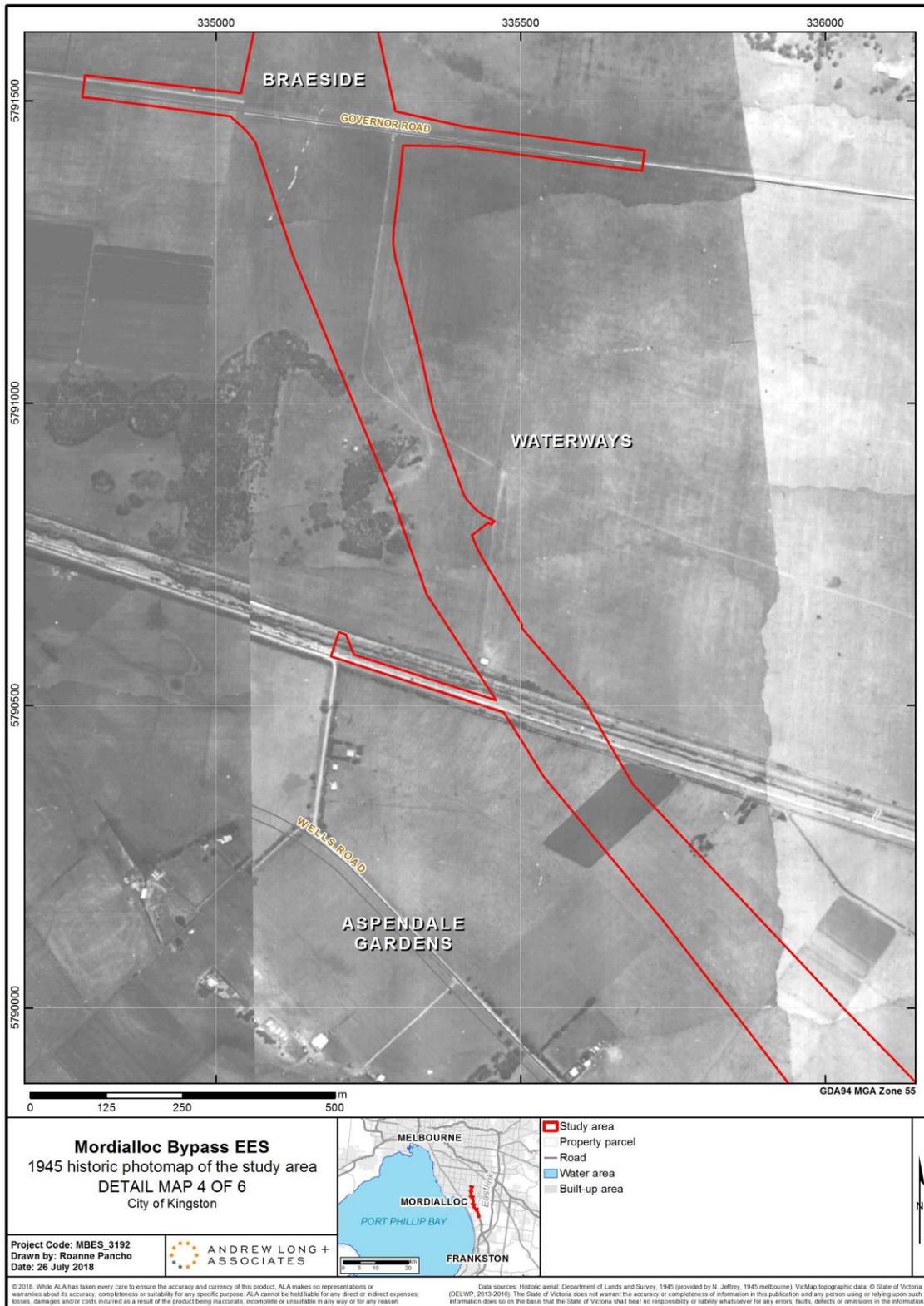
Map 5: 1945 historic photomap (detail map 1)



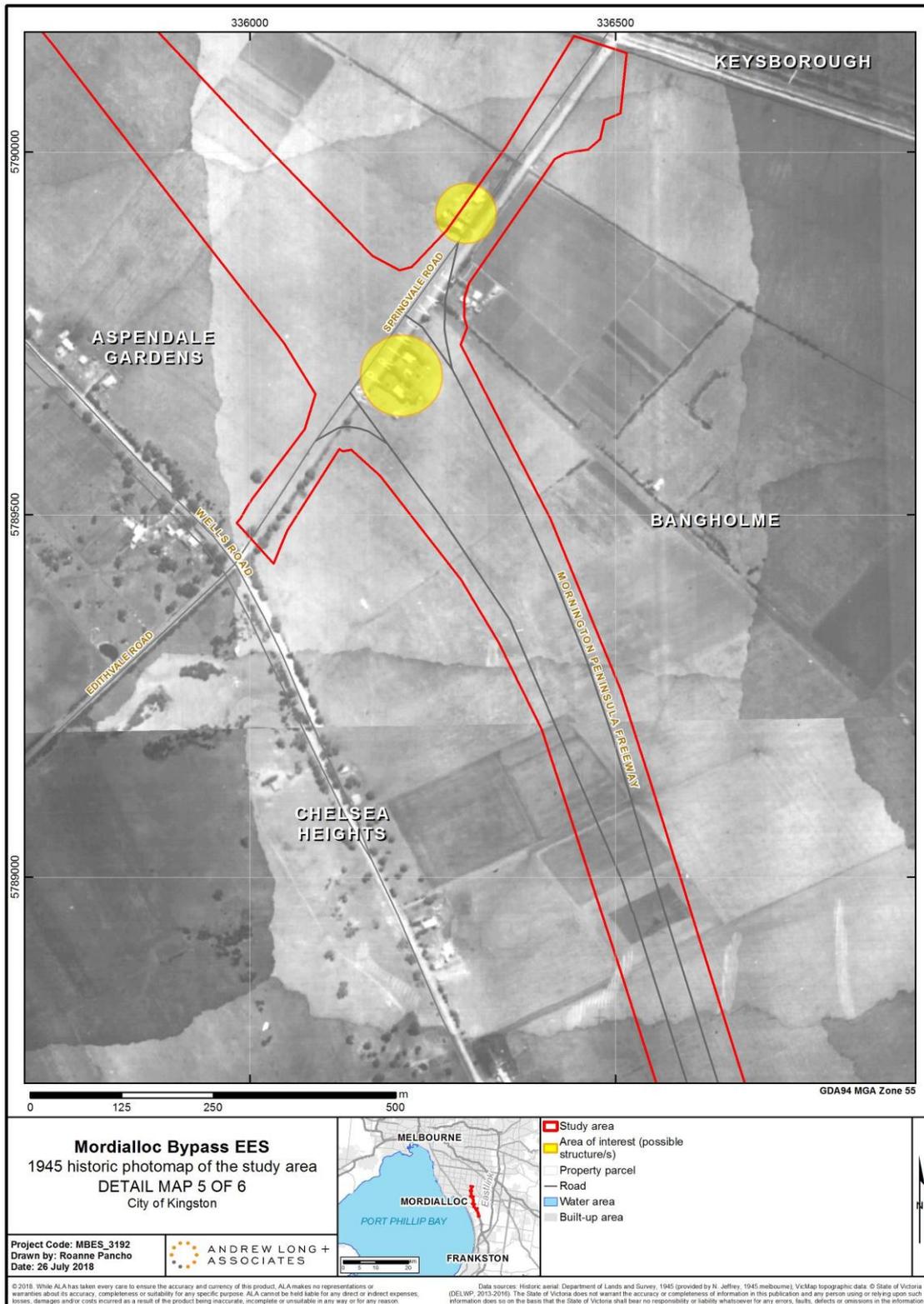
Map 6: 1945 historic photomap (detail map 2), showing area of interest



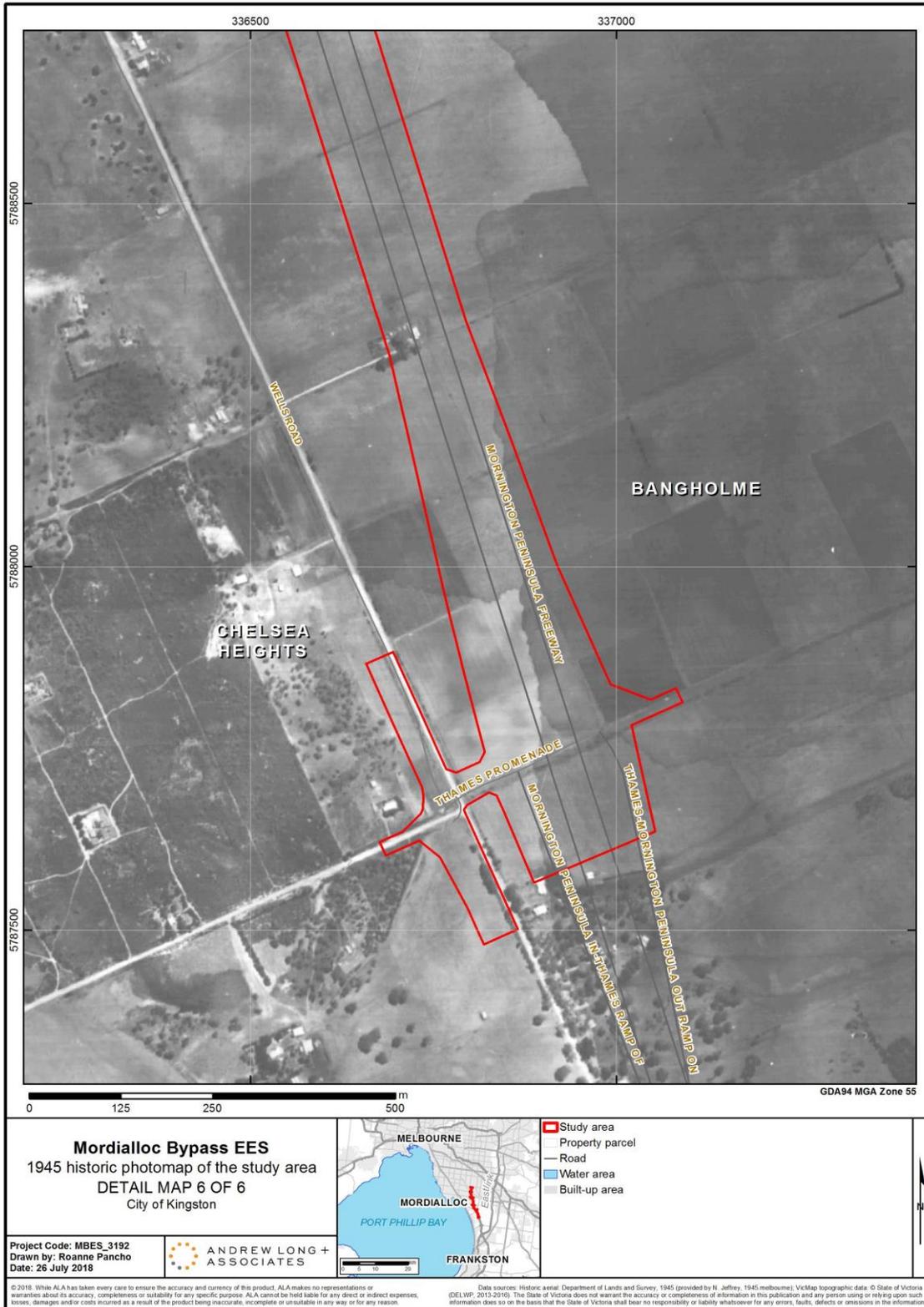
Map 7: 1945 historic photomap (detail map 3), showing area of interest (relating to the Braeside Sewage Treatment Plant)



Map 8: 1945 historic photomap (detail map 4)



Map 9: 1945 historic photomap (detail map 5), showing areas of interest



Map 10: 1945 historic photomap (detail map 6), showing areas of interest

5.7 Summary of Findings

The desktop assessment has reviewed the land use history, historical places and archaeological potential within the study area.

The results have determined that a variety of land use activities have occurred, including vegetation clearance and land preparation for the pastoral and agricultural uses, modifications to the hydrology of the region, development of commercial and industrial enterprises and the construction and upgrades to road, rail and utility infrastructure. Furthermore, it was determined that a single heritage place, being the 'Braeside Park Precinct' (HO104) Heritage Overlay, is located within the study area and will be affected by the proposed activity. The VHR site of the Former Christ Church of England (H0225), located adjacent to the study area, will not be affected by the proposed activity.

In reviewing the land use activities alongside historical documentation (including the place registration details for HO104), it has been determined that there is a high likelihood for the presence of archaeological features relating to the Braeside Treatment Plant, European pastoral activities are more likely in areas of lesser disturbance within the study area. Historical archaeological features of low archaeological significance and low research value are expected to be present where HO104 is located within the study area. Historical archaeological features of higher significance relating to 19th century European pastoral activities may also be present across the study area, within areas where prior development has not been substantial. These areas include the segment of the study area between Centre Dandenong Road and Governor Road, and the segment between the Mordialloc Creek and Springvale Road, which is addressed by the archaeological assessment (survey).

5.8 Archaeological Assessment Method of Assessment

This section outlines the methods and results of the archaeological survey. The aims of the archaeological assessment were twofold:

- To determine the presence and extent of variable levels of archaeological site preservation (e.g. features and/or deposits) across the study area, by methodically examining remnant features via a combination of systematic pedestrian and opportunistic vehicular survey; and
- To determine the study area's overall archaeological potential.

In order to test the conclusions of the desktop assessment and the likely archaeological potential within the study area, areas determined to have undergone minimal previous ground disturbance and/or areas relating to the existing Heritage Overlay (HO104) within the study area were investigated (see Section 2.6). The areas surveyed were confined to the property parcels indicated below in

Table 9, where archaeological potential was assessed as being moderate to high. Please note, the areas excluded from survey were determined to be of high disturbance and low archaeological potential, as discussed throughout the desktop assessment (Section 2). For the purposes of the survey and on the basis of current land use, the study area was divided and assessed as three investigation areas (IA). These IAs include (Map 11):

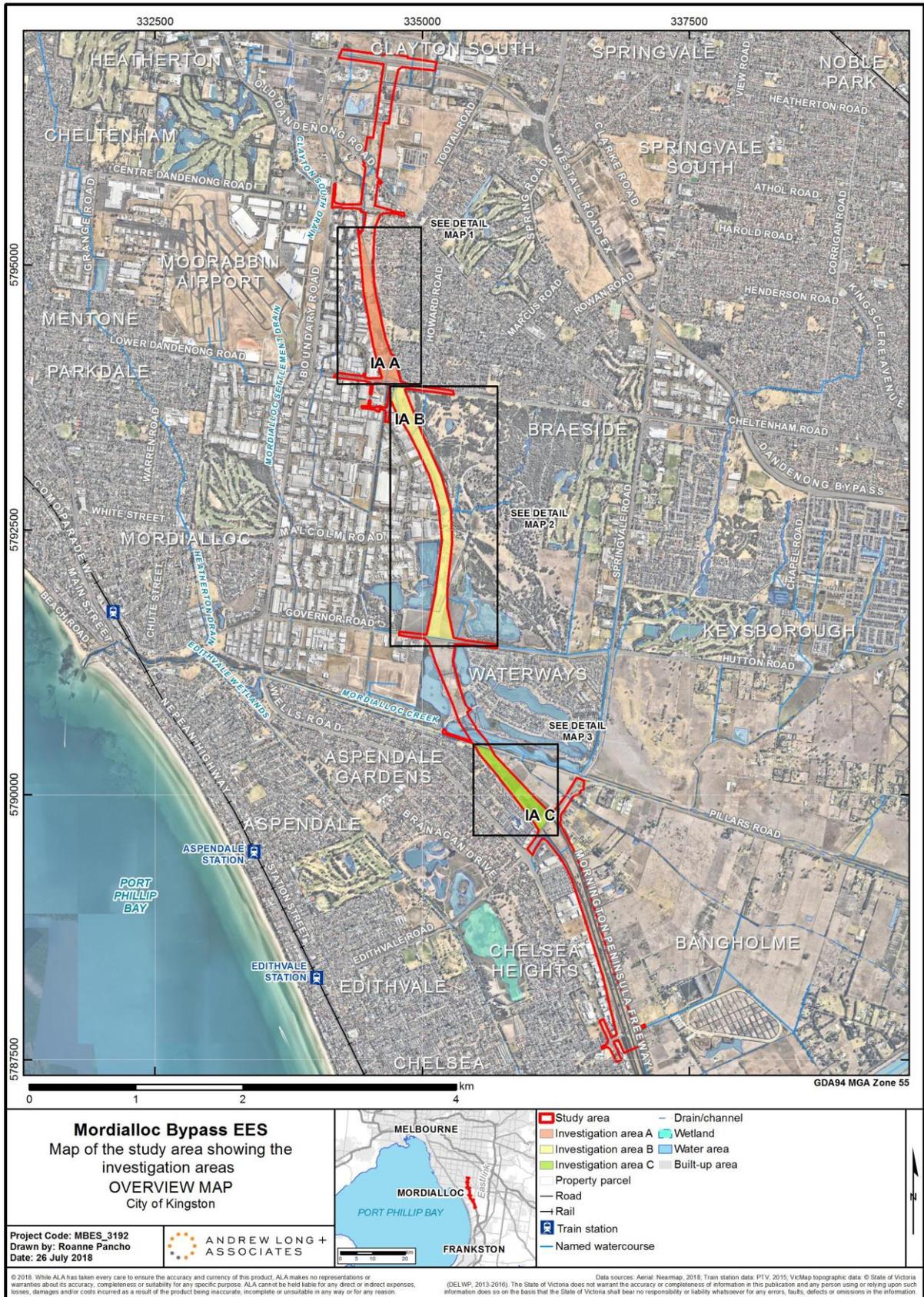
- **Investigation Area A (IA-A):** the study area between Centre Dandenong and Lower Dandenong Roads,

- **Investigation Area B (IA-B):** the study area between Lower Dandenong and Governor Roads, and
- **Investigation Area C (IA-C):** the study area between the Mordialloc Creek and Springvale Road.

The archaeological survey was undertaken in accordance with Heritage Victoria's *Guidelines for Conducting Archaeological Surveys* (2008 (updated 2013)).

Table 9: Property parcels and Investigation Areas surveyed within the study area

Investigation Area (IA)	Property Identifier/SPI	Address
IA-A	A\LP204907	260, 1/260 and 262 Centre Dandenong Road, Dingley Village, 3172
	1\TP171639	Centre Dandenong Road, Dingley Village, 3172
	2\LP141797	Follett Road, Dingley Village, 3172
	E\LP135078	411-415 Lower Dandenong Road, Dingley Village, 3172
	1\TP597813	417-433 And 411-415 Lower Dandenong Road, Dingley Village, 3172
IA-B	1\PS420865	Lower Dandenong Road, Braeside, 3195
	1\PS431563	Governor Road, Braeside, 3195
IA-C	B\PS436427	225-289 Wells Road, Aspendale Gardens, 3195
	A\PS605114	13-17 Maidenhair Mews, Aspendale Gardens, 3195
	1\TP592493	Springvale Road, Aspendale Gardens, 3195
	3\TP749429	Springvale Road, Aspendale Gardens, 3195
	B\PS443745	Springvale Road, Aspendale Gardens, 3195



Map 11: Investigation areas surveyed within the study area

5.9 Methodology of the Archaeological Survey

The field survey methodology consisted of a broad visual assessment of the landscape based on a pedestrian and vehicular survey of the study area. The survey aimed to establish the archaeological potential (low-high) across the study area in areas outlined by the desktop assessment (see Section 2). Archaeological potential is based largely on the determination of landscape integrity and archaeological imprint. These classifications are further outlined below:

- *Landscape Integrity* – this variable reflects the general type and extent of post-depositional processes in the landscape, and their potential for preserving archaeological deposits. These consist of a range of natural and anthropogenic activities, including erosion, sedimentary deposition, land development and agriculture. These activities have the potential to either destroy, modify or obscure archaeological features. The extent to which these processes affect the identification or survival of an archaeological feature is determined by its archaeological imprint.
- *Archaeological Imprint* – this variable reflects the durability and obtrusiveness of archaeological features (AFs), and the relative extent to which they retain structure given post-depositional processes. This has been based on historical documentation for the materials used in building construction (e.g. stone, brick, timber, bark or galvanised iron clad), as well as any physical evidence for the feature visible on the ground today (e.g. footings). If known, the intensity of occupation could also be used as qualifying variable (e.g. where a site is used for an extended period for an activity that results in an extensive build-up of archaeological deposits).

Given the largely subsurface nature of the archaeological record as a whole, investigations were principally focused on the assessment of surface features relative to the location of possible historical structures detailed by aerial photographs, and in areas where substantial development had not occurred (with the exception of the area relevant to HO104). The identification of intact surface features such as building infrastructure is viewed as an indication of likely intact subsurface features. Where items of heritage significance were identified, they were assigned an *Archaeological Feature* (AF) identification registration number (AF ID).

The survey was undertaken on 16 February 2018 by two suitably qualified archaeologists Paul Pepdjonovic and Brigid Hill (ALA). The survey was conducted across 12 property parcels within the study area, with a total area of 0.68 km² (Table 9 and Map 11). Accessible sections of the study area were surveyed systematically by walking standardised pedestrian transects, with each member of the field team spaced approximately 2-4 m apart. This spacing enabled each individual to examine the surface of the study area and determine the presence of archaeological remains at ground level. In areas where it was not possible to undertake a systematic pedestrian survey, the subject area was visually inspected. The survey also resulted in a detailed review of ground surface conditions as compared to an assessment of previous ground disturbance previously demonstrated by the archaeological investigations conducted by Murphy and Rymer (in prep.:36-37). Furthermore, the survey enabled the verification of existing registered heritage fabric relating to HO104.

The survey targeted areas where historical archaeological features considered to be of higher significance relating to 19th century European pastoral activities were likely to be present, and within areas where prior development had not been substantial. This includes IA-A to IA-C and the area relevant to HO104.

5.9.1 Limitations

Due to poor visibility (e.g. dense ground cover), obstructions (e.g. sealed surfaces, built structures) and livestock (e.g. cows and horses), small sections within the survey area were selected and surveyed

opportunistically. In these areas, it was not possible to examine the structure and content of the ground surface. However, observations were recorded at a distance which considered the overall ground surface conditions of the immediately surrounding landscape.

5.10 Results of the Archaeological Survey

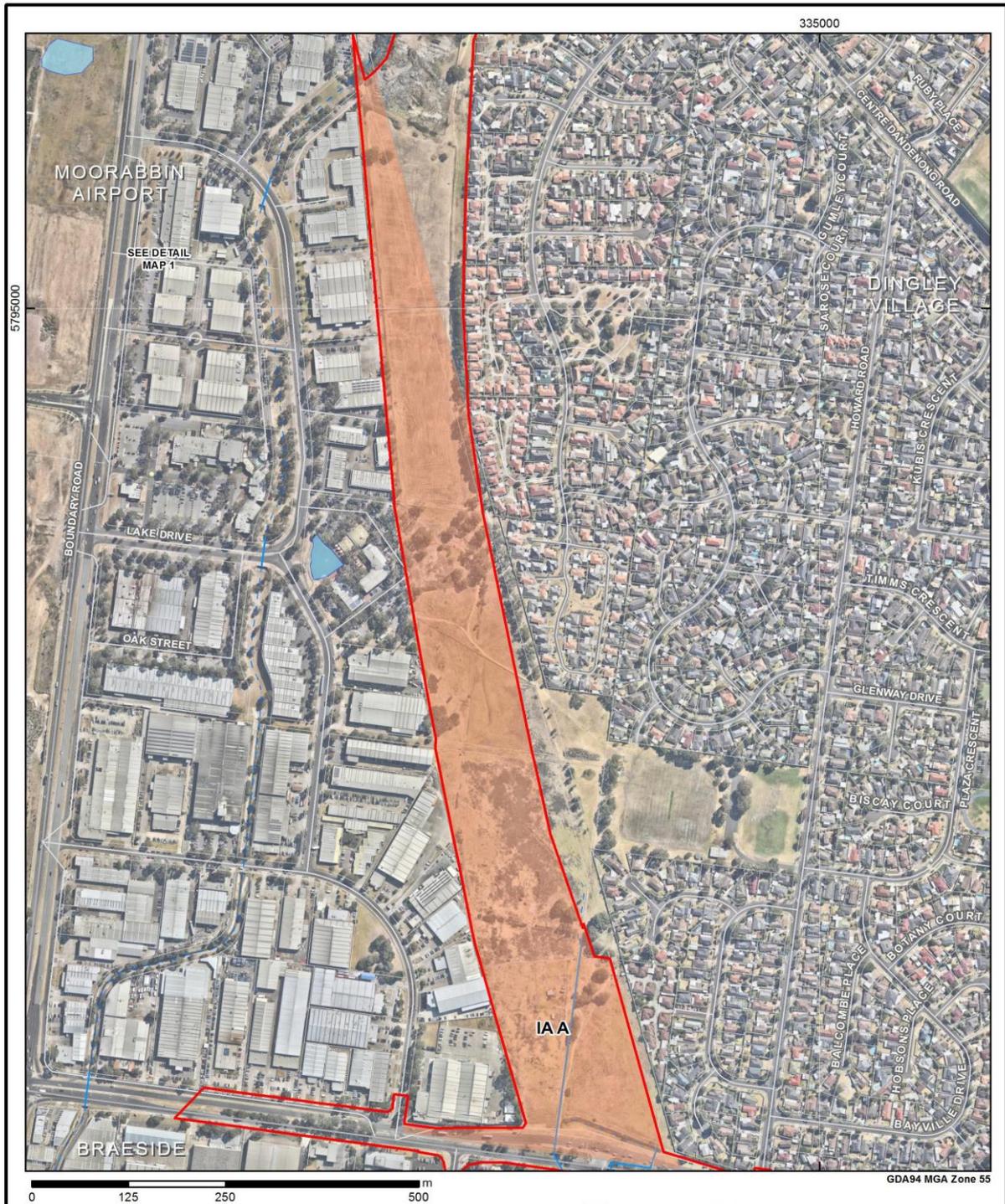
The results of the survey are discussed below in relation to the relevant Investigation Areas of the study area as established in Section 3.1.

Investigation Area A (IA-A) – Centre Dandenong to Lower Dandenong Roads

IA-A was defined as the property parcels contained by Centre Dandenong Road to the north and Lower Dandenong Road to the south, within Dingley Village (

). Overall, the area comprises a series of interconnected grassed paddocks, unsealed access tracks, horse training facilities and storage structures. The landscape is described as flat/levelled, with gently undulating areas. Moderate undulations were identified where prior earthworks had occurred. According to historical aerials (c1945), IA-A was formally utilised as farmland and contained a small number of structural features in isolation (south-east) (Map 12).

The area immediately north of Lake Drive comprised open grassland (disused paddock) which has been cleared of native vegetation and visibly ploughed and/or levelled. Here, the study area is intersected by a Melbourne Water asset along its north-eastern fringe and is bounded by a built-up residential complex (east), a combination of commercial and light industrial enterprises (west) and an intensively worked industrial area (north) (Plate 1). South of Lake Drive, a cluster of modified native vegetation was identified amongst several soil mounds (gentle moderate undulations), and open drainage (two channels) which appear to relate to prior construction works (c. 2005) (Plate 2). The remnants of these works are currently represented by a concrete pylon, fenced-off area, concrete hardstand and asphalted surfaces (Plate 3). Immediately south, IA-A is characterised by open grassland (mown) and unsealed pedestrian access tracks (Plate 4). Multiple paddocks, comprising variable grass cover (short and tall), blackberry overgrowth and animal tracks were also identified in the area adjacent to the Redwood Drive. This area adjoins to the southern parcel, which is an area occupied by horse-training structures and facilities (Plate 5). The parcels which front onto Lower Dandenong Road contain storage sheds, water troughs and baths, horse jumping and loading facilities, which are connected via unsealed access tracks and contained by numerous wire-fence paddocks. The area confined to the south-east, and adjacent to the Lower Dandenong Road driveway, comprises medium to tall grass, weed overgrowth, a cluster of trees and sandy soils on an undulating landform (variable depressions) (Plate 6). These in particular correspond to the location of former farm structures (c. 1945). However, it was determined that the soils within this area had been previously disturbed (up-turned) with no physical evidence of the former structures. Overall, the survey did not identify any features and/or deposits of historical archaeological significance within IA-A.



<p>Mordialloc Bypass EES Map of the study area showing the investigation areas DETAIL MAP 1 OF 3 City of Kingston</p>		<ul style="list-style-type: none"> ■ Study area Investigation area A Property parcel Road Rail Train station Named watercourse Drain/channel Wetland Water area Built-up area 	
<p>Project Code: MBES_3192 Drawn by: Roanne Pancho Date: 26 July 2018</p>		<p><small>© 2018. While ALA has taken every care to ensure the accuracy and currency of this product, ALA makes no representations or warranties about its accuracy, completeness or suitability for any specific purpose. ALA cannot be held liable for any direct or indirect expenses, losses, damages and/or costs incurred as a result of the product being inaccurate, incomplete or unsuitable in any way or for any reason. (DELWP, 2013-2016). The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. Data sources: Aerial; Neomap, 2018; Train station data: PTV, 2015; VicMap topographic data. © State of Victoria</small></p>	

Map 12: Investigation area A (IA-A)



Plate 1: IA-A, showing paddocks and unsealed vehicle track north of Lake Drive (view north)



Plate 2:IA-A, showing modified native vegetation amongst several soil mounds (view south-west)



Plate 3: IA-A, showing the fenced-off concrete hardstand and asphalted surfaces (view south)



Plate 4: IA-A, showing open grass land south of Lake Drive (view south)



Plate 5: IA-A, showing horse paddocks north of Lower Dandenong Rd and evidence of associated equestrian land use (view east)



Plate 6: IA-A, showing unsealed vehicle track north of Lower Dandenong Road (view north)

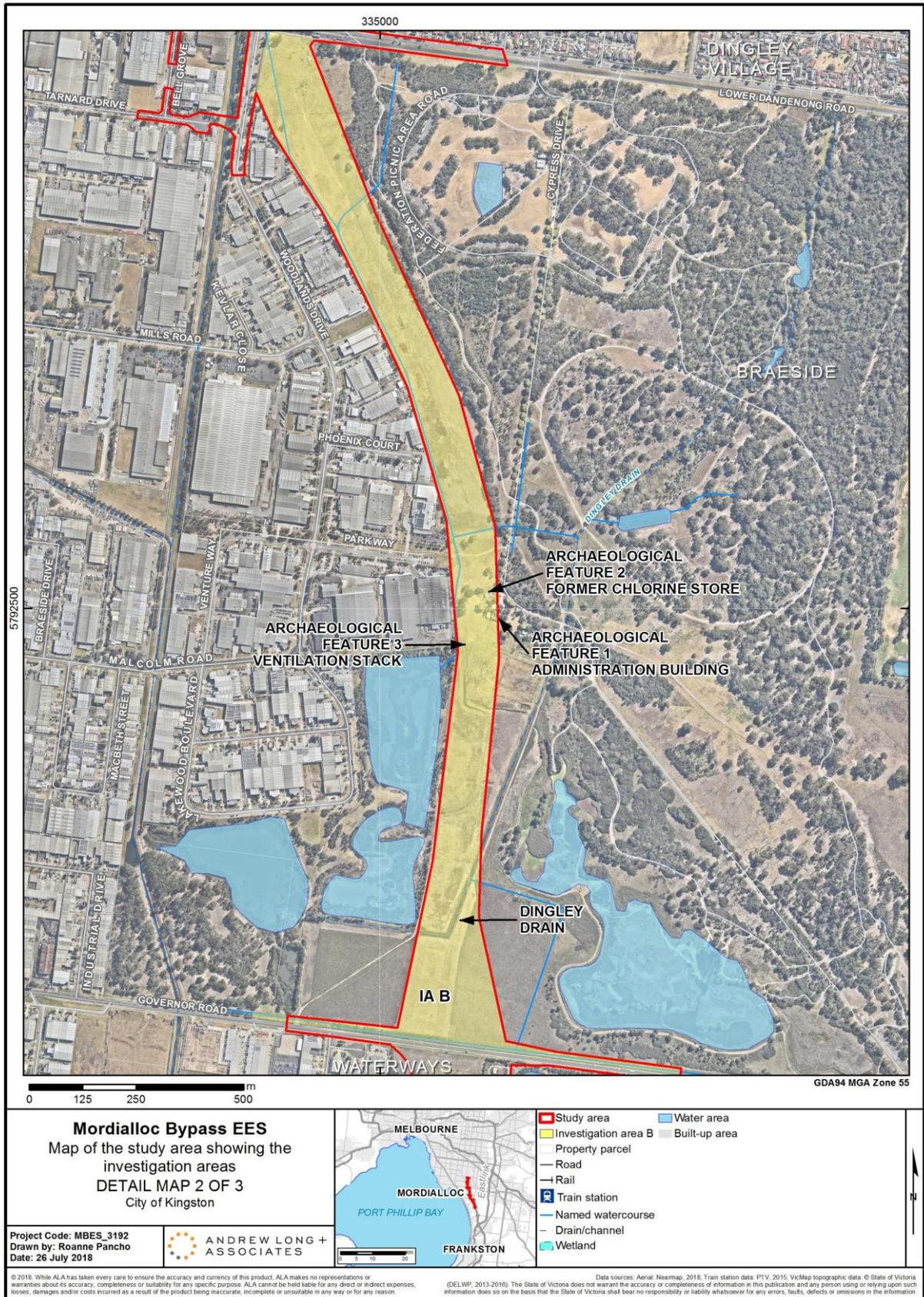
Investigation Area B (IA-B) –Lower Dandenong to Governor Roads

IA-B was defined as the property parcels contained by Lower Dandenong Road to the north and Governor Road to the south, within Braeside and Braeside Park (Map 13). Overall, the area comprises a series of interconnected grassed areas, unsealed access tracks, drainage channels, and land/structures associated with the former Braeside Sewage Treatment Plant. IA-B is bounded by built-up commercial and light industrial enterprises (east), and Braeside Park (west). The landscape is described as flat/levelled, with gently undulating areas and low sandy mounds being the result of prior ground disturbances and a deflated dune. According to the desktop assessment, the majority of IA-B was utilised as farmland with no representation of historical structures beyond those associated with the Braeside Sewage Treatment Plant.

The area immediately south of Lower Dandenong Road and north of the former Braeside Sewage Treatment Plant comprised open grassland (disused paddocks) which have been cleared of native vegetation and visibly ploughed and/or levelled (Plate 7). A possible sewage treatment facility was identified at the north-eastern corner of the study area which is likely representative of secondary plant operations (e.g. ventilation and maintenance access) (Plate 8). Whilst representative of the ancillary sewage treatment infrastructure, it is not considered to be of heritage significance on the basis of its low research value and association with more broad-scale utilisation of sewage infrastructure which serviced the general area. Along the western margin of this area, several undulations in the landscape were identified, further demonstrative of modern disturbances of natural sandy mounds as a result of prior earthworks (c1974). Three drainage channels were also identified, one of which traverses the entirety of IA-B from north to south, one north of Mills Road (east to west) and one opposite Park Way (east to west) (Plate 9). No historical archaeological features and/or deposits were identified within this area.

The area containing the former Braeside Treatment Plant and immediate surrounds, occurs within an open grassed area and along a deflated dune. The landscape within this area is described as mildly undulating with visible disturbances associated with subsurface infrastructure. Here, several Cyprus trees were identified on the deflated dune and adjacent to historically significant and known features including a brick-based administration building (AF 1) and a brick-based storage structure (former chlorine store) (AF 2) (see HO104) (Plate 10 to Plate 12). A timber structure (on metal stilts) was also located adjacent to AF 1, which appears to have been constructed post c. 1945 (Plate 13). Several concrete service pits (e.g. manholes), a concrete trough and a metal ventilation stack were also identified (Plate 14 to Plate 16). Whilst the ventilation stack (AF 3) is a prominent feature, it is considered to be of low research value given its association with more broad-scale utilisation of sewage infrastructure (e.g. sewage pipes) which serviced the general area. However, it is likely that AF 3 will not be impacted by the proposed works as the feature does not currently intersect the planned design of the roadway. Furthermore, the concrete features which were identified in close proximity to AF 3, were similarly representative of the plant's broader operations and subsurface infrastructure (e.g. sewage pipes) and are therefore considered to be of low archaeological significance. No further historical archaeological features and/or deposits were identified within this area.

The area immediately south the former Braeside Treatment Plant comprised open grassland has been cleared of native vegetation and visibly levelled as a result of the decommissioning of plant infrastructure (e.g. ponds). The former plant pond area currently comprises dense grassland (e.g. tall grass) and reeds, bounded to the west by wetlands and to the east by Dingley Drain. This area was surveyed opportunistically, given dense ground surface coverage, poor surface visibility and known disturbances. The area south of the Dingley Drain comprised open grassland (disused paddocks) which have been cleared of native vegetation (Plate 17). No historical archaeological features and/or deposits were identified within this area.



Map 13: Investigation area B (IA-B), showing archaeological features (AF 1-3)



Plate 7: IA-B, showing levelled paddocks and low sandy mounds (view north)



Plate 8: IA-B, showing secondary plant infrastructure (view east)



Plate 9: showing the drain traversing IA-B (east-west), north of Park Way (view south-east)



Plate 10: IA-B, showing AF1 red brick-based administration building (view south-east)



Plate 11: IA-B, showing brick-based storage structure (former chlorine store) (view south-west)



Plate 12: IA-B, northwest of AF1 red brick-based administration building, showing deflated dune (view south)



Plate 13: IA-B, showing ancillary timber structure on stilts (view north)



Plate 14: IA-B, showing AF1 red brick-based administration building and HF3 with associated man-hole infrastructure (view north)



Plate 15: IA-B, showing concrete service pit south of former water treatment plant (view south)



Plate 16: IA-B, showing AF3, metal ventilation stack (view west)

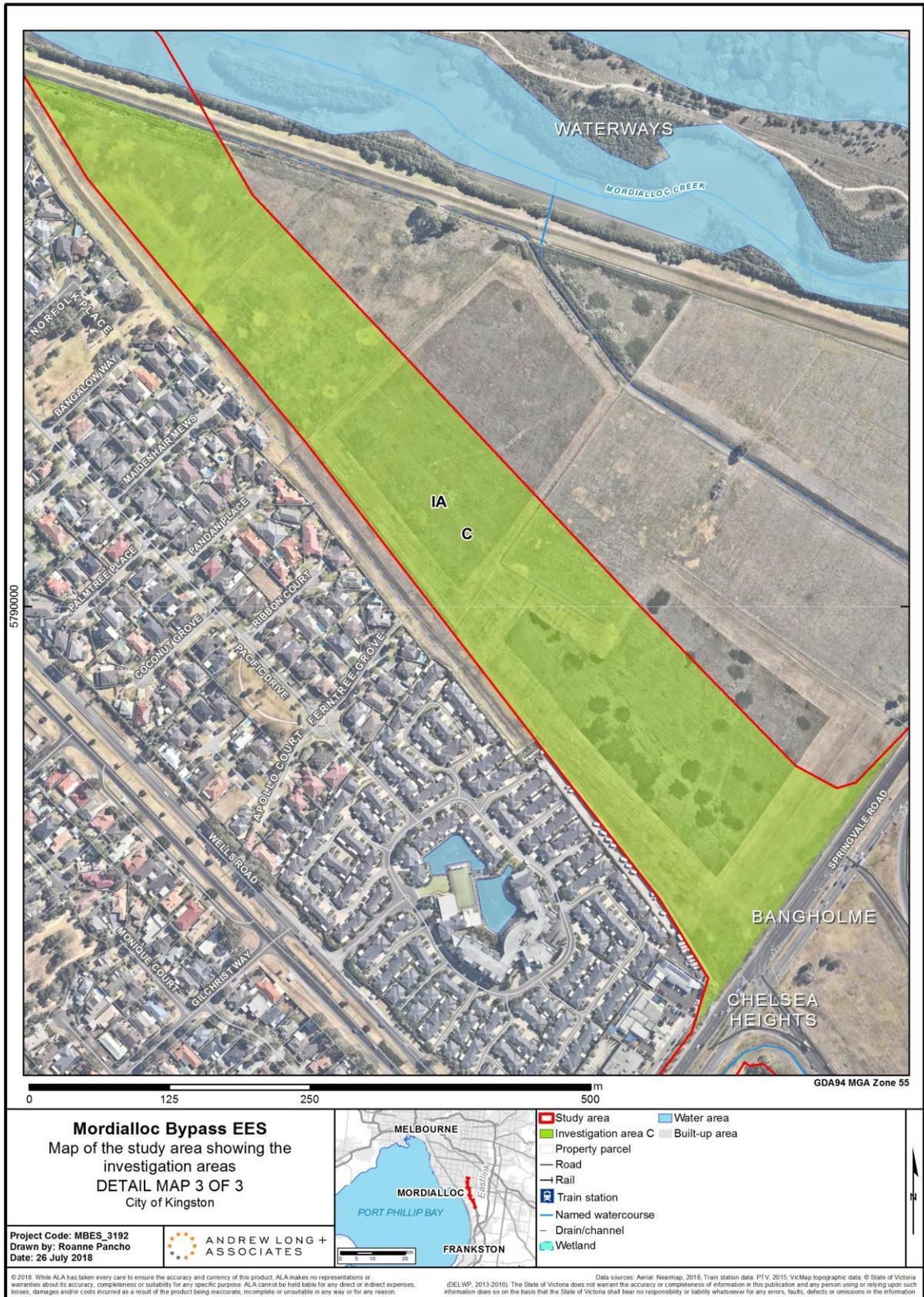


Plate 17: IA-B, north of Governors Road showing access track adjacent to study area, with green reeds of the Dingley Drain visible to the right (view south)

Investigation Area C (IA-C) –Mordialloc Creek to Springvale Road

IA-C was defined as the property parcels contained by Mordialloc Creek to the north and Springvale Road to the south, within Aspendale Gardens (Map 14). Overall, the area comprises a series of interconnected grassed paddocks which are further bounded by built-up residential dwellings and open drainage channel (west), and the Mordialloc Creek (east). The landscape is described as flat/levelled, with gently undulating areas (former floodplain). Historically, the area appears to have been utilised as farmland with no evidence for historical structures (Map 14).

The area immediately adjacent to the Mordialloc Creek comprised artificial embankments (oriented east to west) which were constructed as a result of prior channelisation works, artificial wetlands and drains (c2005) (Plate 18). Vegetation surrounding this area comprised reeds and tall grasses, with minor surface exposures along the highest points of the embankment. The land surface in proximity to this area demonstrated undulations characteristic of prior earthworks which contrasted the landscape further south which was visibly ploughed and/or levelled as a result of prior pastoral activities. The majority of IA-C comprised open grassland (disused paddocks) which have been cleared of native vegetation, and included few areas exotic and modified vegetation (Plate 19 and Plate 20). Whilst grass cover was variable across IA-C, the condition of the landform and land use was largely consistent across the area. However, a higher degree of ground disturbance was identified along the intersection of Springvale Road and the Mornington Peninsula Freeway, where significant earthworks as part of previous road construction had previously occurred (Plate 21). Overall, the survey did not identify features and/or deposits of historical archaeological significance within IA-C.



Map 14: Investigation area C (IA-C)



Plate 18: IA-C, showing embankments and earthworks of Mordialloc Creek (running east-west) (view north)



Plate 19: IA-C, showing open grass land (view west)



Plate 20: IA-C, showing open grass land (view north)



Plate 21: IA-C, showing Mornington Freeway entrance from Springvale Road (view south east)

5.11 Conclusion

The survey targeted areas identified by the desktop assessment which indicated a high level of archaeological potential as demonstrated by the desktop assessment. For the purposes of the survey and on the basis of current land use, the study area was divided and assessed as three investigation areas (IA-A to IA-C). The areas excluded from the survey were determined to be of high disturbance and low archaeological potential. Overall, the survey demonstrated a low potential for archaeological features and/or deposits of significance to be present within the surveyed areas of the study area. The results are summarised below:

Investigation Area A (IA-A):

Given the previous extent of pastoralism, lack of any substantial historical development (as demonstrated by the survey) and modern disturbances within IA-A, it was considered unlikely that historical archaeological features and/or deposits of significance would be located within this section of the study area. Therefore, there is a low likelihood that historical archaeological features and/or deposits exist within IA-A, and if they occur are likely to be of low significance.

Investigation Area B (IA-B):

The survey re-identified known historical features (AF 1 and 2) within the area contained by HO104, however additional features including ancillary sewage treatment infrastructure (e.g. AF 3, service pits and troughs) were also identified. Furthermore, it was determined that the ancillary infrastructure identified likely relate to subsurface infrastructure (e.g. sewage pipes). The identified ancillary infrastructure is not considered to be of high archaeological significance. It is considered highly likely that ancillary features relating to the former Braeside Sewage Treatment Plant may be present, however it is highly likely that these will be of low historical archaeological significance and are will contain little to no research value. This assessment maintains that the historically significant items, at a local level, include, the administration building (AF 1), former chlorine store (AF 2) – within the project area, and concrete tanks and treatment ponds – outside the project area. For these reasons, an escalation of the existing heritage listing is not recommended.

In addition, as no archaeological features and/or deposits relating to European pastoralism were identified, there is a low likelihood that such features/deposits are represented in a subsurface context within IA-B.

Investigation Area C (IA-C):

Given the previous extent pastoralism, lack of any substantial historical development (as demonstrated by the survey) and modern disturbances within IA-C, it was considered unlikely that historical archaeological features and/or deposits of significance would be located within this section of the study area. Therefore, there is a low likelihood that historical archaeological features and/or deposits exist within IA-C, and if they occur are likely to be of low significance.

6.0 Risk Assessment

An environmental risk assessment, including an assessment of risk to historic cultural heritage was undertaken to identify key environmental issues associated with the construction and operation of the project.

Planning, pre-construction and construction/maintenance activities associated with the construction of the Mordialloc Bypass could present risks to historical cultural heritage items in a limited fashion throughout the activity area.

Risk R-HH1 - Historical heritage assessment misses areas in assessment or does not cover the whole project area, resulting in a non-compliance with Heritage Act (Planning phase)

Risk to historical heritage in the planning phase is unlikely but could have major consequences. Ultimately this risk is in part managed by the standard controls associated with the contract specifications of this project. Additional controls comprise notification to Heritage Victoria and or local council of proposed works at a given location.

Risk R-HH2 - Geotechnical investigations impact on culturally significant places (Initial phase)

Geotechnical investigations could pose a risk to historical heritage values, however, such risk is limited in nature given the relatively discrete and localised nature of the works. Standard controls apply.

Risk R-HH3 – Construction activities impact on culturally significant places (Development phase)

The highest level of direct risk to heritage items relates to construction activities during the development phase of the project, during which impacts to previously unidentified heritage as well as identified items may occur. Nonetheless, such risk can be readily managed through standard legislative controls.

Risk R-HH4 - Maintenance activities impact on culturally significant places (Development phase)

Maintenance activities are unlikely to impact substantially on culturally significant places as in general terms the majority of impacts, where they do occur, occur during construction . Standard controls apply.

Key Findings

Impacts to historical cultural heritage can be summarised into two broad categories:

- Statutory planning and environmental approval non-compliances
- Uncover/damage matters of cultural significance

The primary environmental risks identified for historical heritage are provided in **Error! Reference source not found.** The initial risk ratings presented below for both project and cumulative impacts consider standard inherent controls as listed in the Environmental Risk Assessment Report. The additional controls listed in the tables below are those recommended to further mitigate and minimise the primary environmental risks which were risk rated as medium or above. Primary environmental risks which were scored as low did not require additional controls to be applied.

The residual risk ratings presented below for both project and cumulative effects consider standard inherent controls as listed in the Environmental Risk Assessment Report. The additional controls listed in the tables below are those recommended to further mitigate and minimise the environment risks.

Table 10: Historical Cultural Heritage Environmental Risk Assessment Register

Risk ID.	Impact Pathway		Primary Environmental Risk Description	Standard Controls (i.e. VicRoads Contract Specification e.g. Section 177, Section 720, Section 750; EPA Environmental Guidelines for Major Construction Sites and other relevant industry standards) (please detail)	Initial Risk			Additional Mitigation/ Controls	Residual Risk		
	Project Activity / Aspect	Primary Environmental Impact			Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating
R-HH1	Planning	Statutory planning and environmental approval non-compliances	Historical heritage assessment misses areas in assessment or does not cover the whole project area, resulting in a non-compliance with Heritage Act.	In accordance with VicRoads Contract Specification Section 177.J in relation to historic heritage and Section 177.A in relation to environmental management plans. Notify Heritage Victoria/local municipal council regarding proposed major works in activity area location.	Minor	Unlikely	Low	Not required	Minor	Unlikely	Low
R-HH2	Pre-construction activities	Uncovers/damages matters of cultural significance	Geotechnical investigations impact on culturally significant places.	In accordance with VicRoads Contract Specification Section 177.J in relation to historic heritage and Section 177.A in relation to environmental management plans.	Minor	Unlikely	Low	Not required	Minor	Unlikely	Low
R-HH3	Earthworks	Uncovers/damages matters of cultural significance	Construction activities impact on culturally significant places.	In accordance with VicRoads Contract Specification Section 177.J in relation to historic heritage and Section 177.A in relation to environmental management plans. Works must comply with the conditions of the approved Heritage Victoria Permit/Consent. Cultural Awareness training for construction personnel. Notify Heritage Victoria/local municipal council regarding proposed major works in activity area location.	Minor	Unlikely	Low	Not required	Minor	Unlikely	Low

Risk ID.	Impact Pathway			Standard Controls (i.e. VicRoads Contract Specification e.g. Section 177, Section 720, Section 750; EPA Environmental Guidelines for Major Construction Sites and other relevant industry standards) (please detail)	Initial Risk			Additional Mitigation/ Controls	Residual Risk		
	Project Activity / Aspect	Primary Environmental Impact	Primary Environmental Risk Description		Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating
R-HH4	Maintenance	Uncovers/damages matters of cultural significance	Maintenance activities impact on culturally significant places.	In accordance with VicRoads Contract Specification Section 177.J in relation to historic heritage and Section 177.A in relation to environmental management plans. Works must comply with the conditions of the approved Heritage Victoria Permit/Consent.	Minor	Rare	Negligible	Not required	Minor	Rare	Negligible

7.0 Impact Assessment and Mitigation

There is one heritage place that will be impacted by the project, and one unimpacted place within 200m (Error! Reference source not found.) of the project area.

Table 11: Heritage places inside and within 200m of the project area

Heritage Site	Heritage Listing	Identifier	Description	Approval Authority	Proximity to project
Braeside Park Precinct	Heritage Overlay	HO104	Southern component: remnant Melbourne Metropolitan Board of Works equipment.	Kingston City Council	Within project area
Christ Church	Victorian Heritage Register	VHR H225, HO3	Built structure (church)	Heritage Victoria	Within study area (within 200m of project area)

7.1 Braeside Park Precinct

While there is a high potential for historical archaeological features relating to the Braeside Treatment Plant to be impacted, the features are likely to be of low historical archaeological significance (e.g. sewage pipes and access pits). More significant components of the precinct will be actively avoided by the project. It should be noted that the alignment of the bypass was altered relatively early on in the planning phases of the project following discussions between MRPA and Parks Victoria. While the intent of this alignment change wasn't for the protection of heritage fabric the net effect of the alteration was to remove significant components of the precinct from the potential for harm.

Impacts to Braeside Park Precinct associated with the former Braeside Treatment Plant have been considered during the development of the reference design. In accordance with archaeological recommendations, the reference design has been developed with consideration to the following:

- Consult Kingston City Council regarding the results of this assessment and to obtain the relevant approvals.
- Retain the built fabric of the brick-based administration building which is of high significance at a local level. It must be noted that avoidance measures will be implemented as part of the proposed activity to protect the administration buildings from harm.
- Retain the built fabric of the brick-based chlorine store (where possible), which is of moderate significance at a local level.
- If built heritage items are likely to be impacted, consult with relevant specialists.
- This assessment has determined that the extent of HO104 (southern component) should be revised in consultation with Council, Heritage Victoria and Parks Victoria. The precise extent of

the new registration is yet to be finalised but it will protect significant fabric, namely the brick-based administration building.

- This assessment maintains that the historically significant items, at a local level, include, the administration building (AF 1), former chlorine store (AF 2) – within the project area, and concrete tanks and treatment ponds – outside the project area. For these reasons, an escalation of the existing heritage listing is not recommended.

7.2 Christ Church

The project is not expected to impact the Christ Church (HO3, H0225); if the project alignment changes and impacts to the church are expected, consultation with Heritage Victoria and relevant heritage permits would need to be sought. At present there is no proposed impact to the Christ Church. Works in proximity to this place will comprise purely surface works within the reservation of Centre Dandenong Road and apart from minor changes to the median strip immediately south of the church there will be no material change to Centre Dandenong Road and no encroachment into the present curtilage of the church. No mitigation measures are required as there will be no impact.

7.3 European pastoralism

Given the previous extent of pastoralism, lack of substantial historical development, and modern disturbances, it is unlikely that historical archaeological features and/or deposits of significance would be present. There is a low likelihood that historical archaeological features relating to European pastoralism are present in the study area, and if they occur are likely to be of low significance.

If historical archaeological remains are encountered the following measures are to be implemented during the activity.

- If any archaeologically significant material is uncovered in the course of the proposed activity, consultation with Heritage Victoria is required to ensure an appropriate archaeological investigation is implemented and/or recording of a site is recorded in the Heritage Inventory.
- Archaeologically significant material should be managed by a qualified and experienced archaeologist in accordance with Heritage Victoria's *Guidelines for Investigating Historical Archaeological Artefacts and Sites 2015*, the *Heritage Act 2017 (Vic)*, and in consultation with Heritage Victoria.
- Under section 123 of the *Heritage Act 2017*, it is an offence to knowingly damage, disturb or excavate without obtaining the appropriate consent/permit from the Executive Director of Heritage Victoria.

8.0 Environmental Performance Requirements

The EPRs outlined in the table below set out the desired environmental outcomes for the project. The EPRs are applicable to all project phases and provided certainty regarding the project’s environmental performance.

Table 12: Historical Cultural Heritage Environmental Performance Requirements

Heritage		
H1	<p>Cultural Heritage Management Plan Comply with and implement the Cultural Heritage Management Plan (CHMP) approved under the <i>Aboriginal Heritage Act 2006</i>.</p>	Construction
H2	<p>Unidentified historical archaeological sites An archaeological discovery protocol must be prepared that specifies measures to avoid and minimise impacts on any previously unidentified historical archaeological sites and values discovered during construction. The management protocol must be consistent with the requirements of the <i>Heritage Act 2017</i> and must be developed in consultation with Heritage Victoria. The protocol must include procedures for ceasing work if human remains or archaeological artefacts are discovered, notifying Heritage Victoria of the find, obtaining consent to deal with the remains or artefact, and dealing with the remains or artefact in accordance with the consent.</p>	Construction
H3	<p>Heritage sites The project must be designed to avoid damage to the Braeside Park Precinct brick buildings. Prior to commencement of works that have the potential to impact on heritage structures or places, appropriate heritage protection plans must be developed for inclusion in the CEMP and physical protection measures must be implemented to avoid or mitigate potential impacts.</p>	Design, Construction

9.0 Conclusions

This assessment has identified only very limited potential for impacts to registered and or potential historical cultural heritage within the project area. Where impacts have been identified, in relation to Braeside Treatment Plant (HO104), these impacts will be limited in effect and will largely occur on land formerly associated with the treatment works but largely devoid of significant built fabric. Impacts to the more significant heritage components of this place were previously coincidentally avoided through the realignment to the proposed roadway to avoid Parks Victoria occupied buildings. This reduction in impact will be maintained by the project in its current alignment.

No other registered places will be impacted by the project.

The likelihood of impacts to currently unidentified cultural heritage are considered to be low given the relatively dispersed nature of occupation within the project area for most of the post-contact period. The discovery of places or archaeological features during construction can be readily managed under the requirements of the *Heritage Act 2017*.

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Online Resources

Australia ICOMOS:

The Burra Charter – The Australia ICOMOS Chart for Place of Cultural Heritage Significance (2013): <http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf> – accessed 18/08/2016.

Department of Environment and Energy:

Australian Heritage Database Place details:

Christ Church Anglican Church, Centre Dandenong Rd, Dingley Village, VIC, Australia:

http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;search=state%3DVIC%3Blga_name%3Dkingston%3Blatitude_1dir%3DS%3Blongitude_1dir%3DE%3Blongitude_2dir%3DE%3Blatitude_2dir%3DS%3Bin_region%3Dpart%3Bkeyword_PD%3D0%3Bkeyword_SS%3D0%3Bkeyword_PH%3D0;place_id=5850 – accessed 19/02/2018.

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<http://localhistory.kingston.vic.gov.au/htm/article/407.htm> – accessed 19/02/2018.

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http://search.slv.vic.gov.au/primolibweb/action/dlDisplay.do?vid=MAIN&search_scope=default_scope&docId=SLV_VOYAGER2376833&fn=permalink – accessed 20/02/2018.

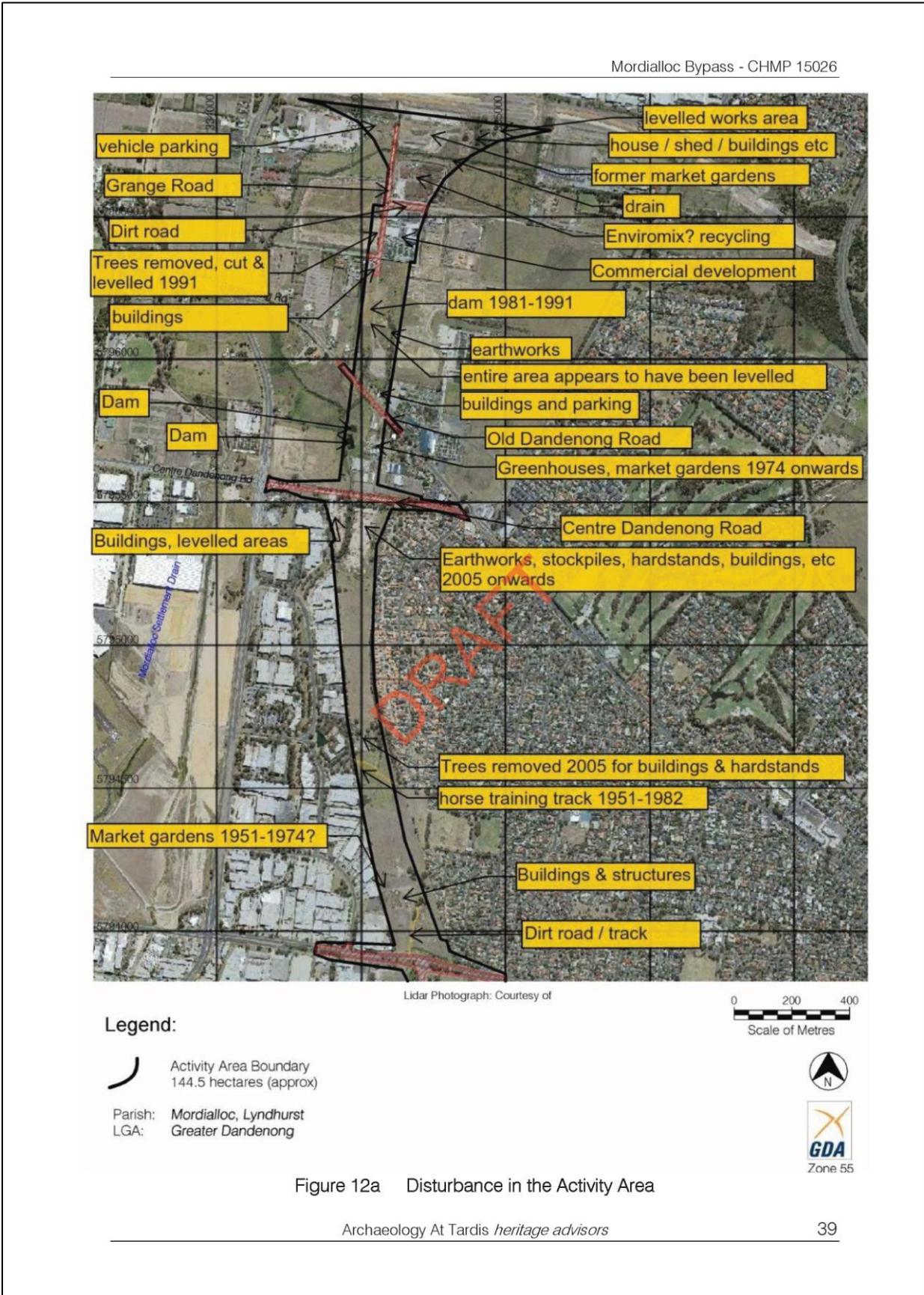
MMBW Plan (c1960s) – Melbourne and Metropolitan Board of Works, scale 1600 feet to 1 inch [index plan]. 6G, Municipalities of Dandenong & Moorabbin:

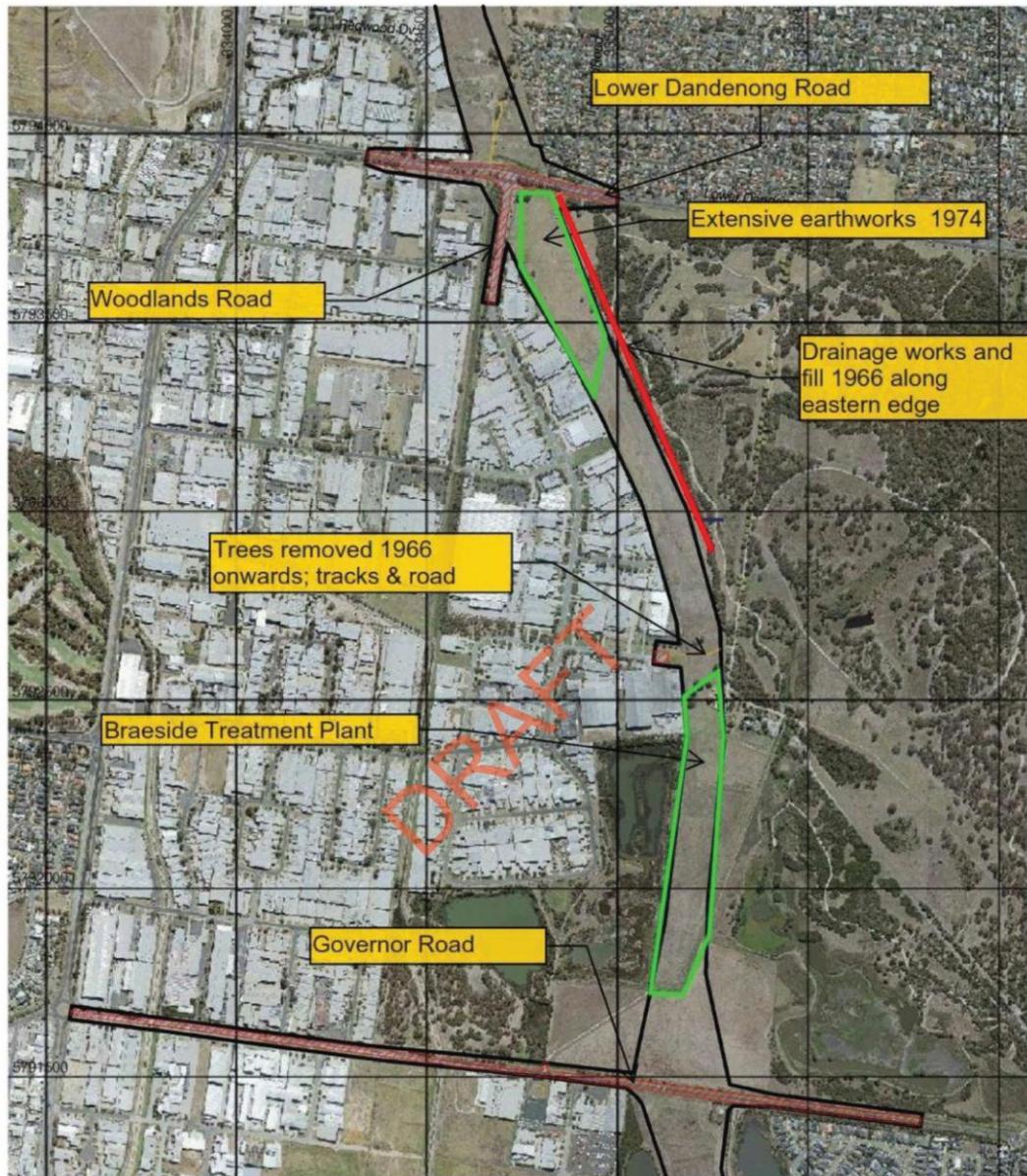
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Appendices

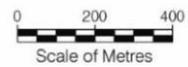
Appendix 1: Land use activities and Lidar imagery as per CHMP 15026 (Murphy and Rymer in prep.:36-37).

Appendix 2: Heritage Place Report (provided by Sponsor) – Braeside Park (Hermes Number 114505).





Aerial Photograph: Courtesy of DSE Website 2015



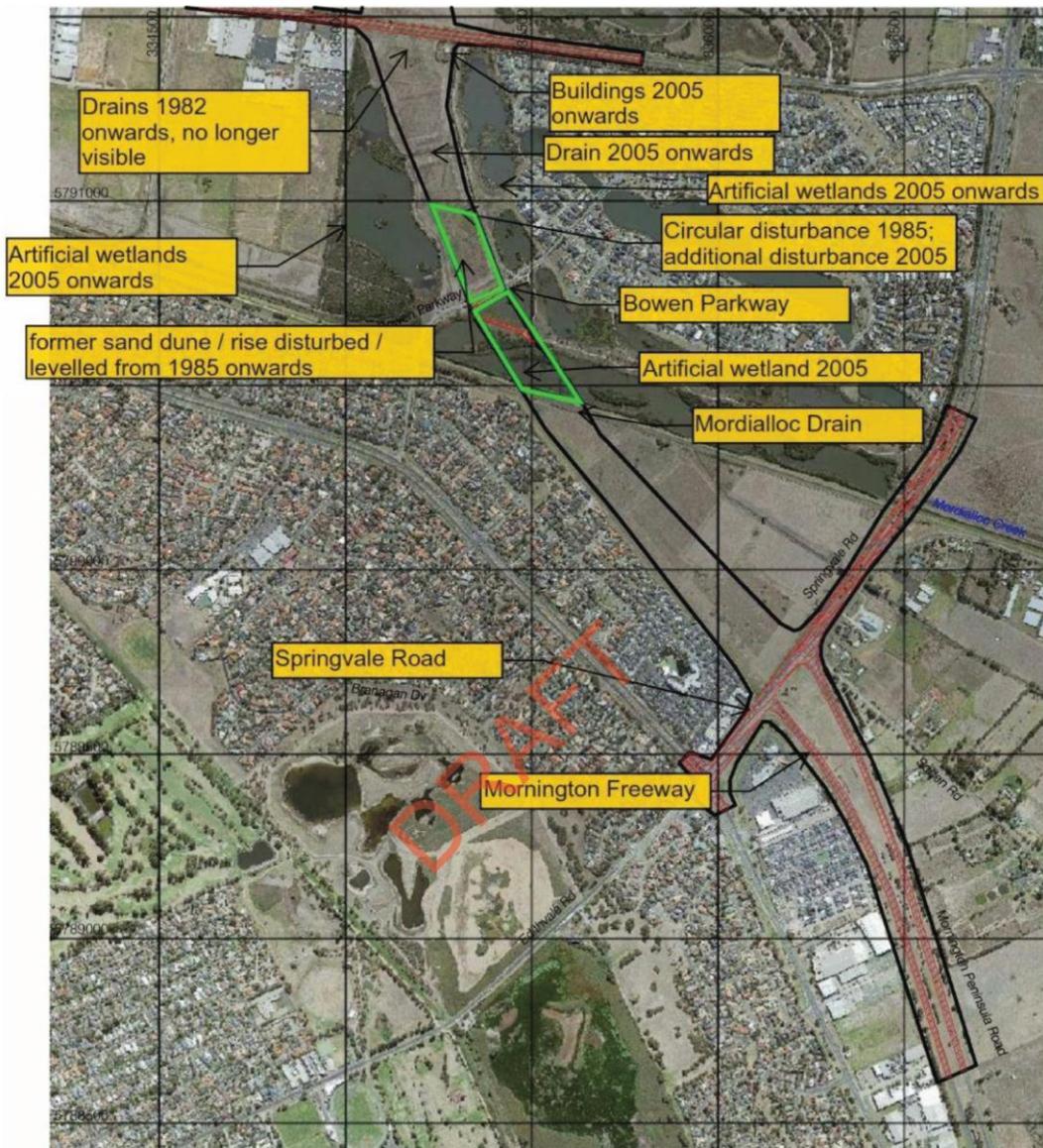
Legend:

 Activity Area Boundary
144.5 hectares (approx)

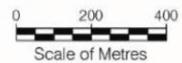
Parish: Mordialloc, Lyndhurst
LGA: Greater Dandenong



Figure 12b Disturbance in the Activity Area



Aerial Photograph: Courtesy of DSE Website 2015



Legend:

 Activity Area Boundary
144.5 hectares (approx)

Parish: Mordialloc, Lyndhurst
LGA: Greater Dandenong



Figure 12c Disturbance in the Activity Area

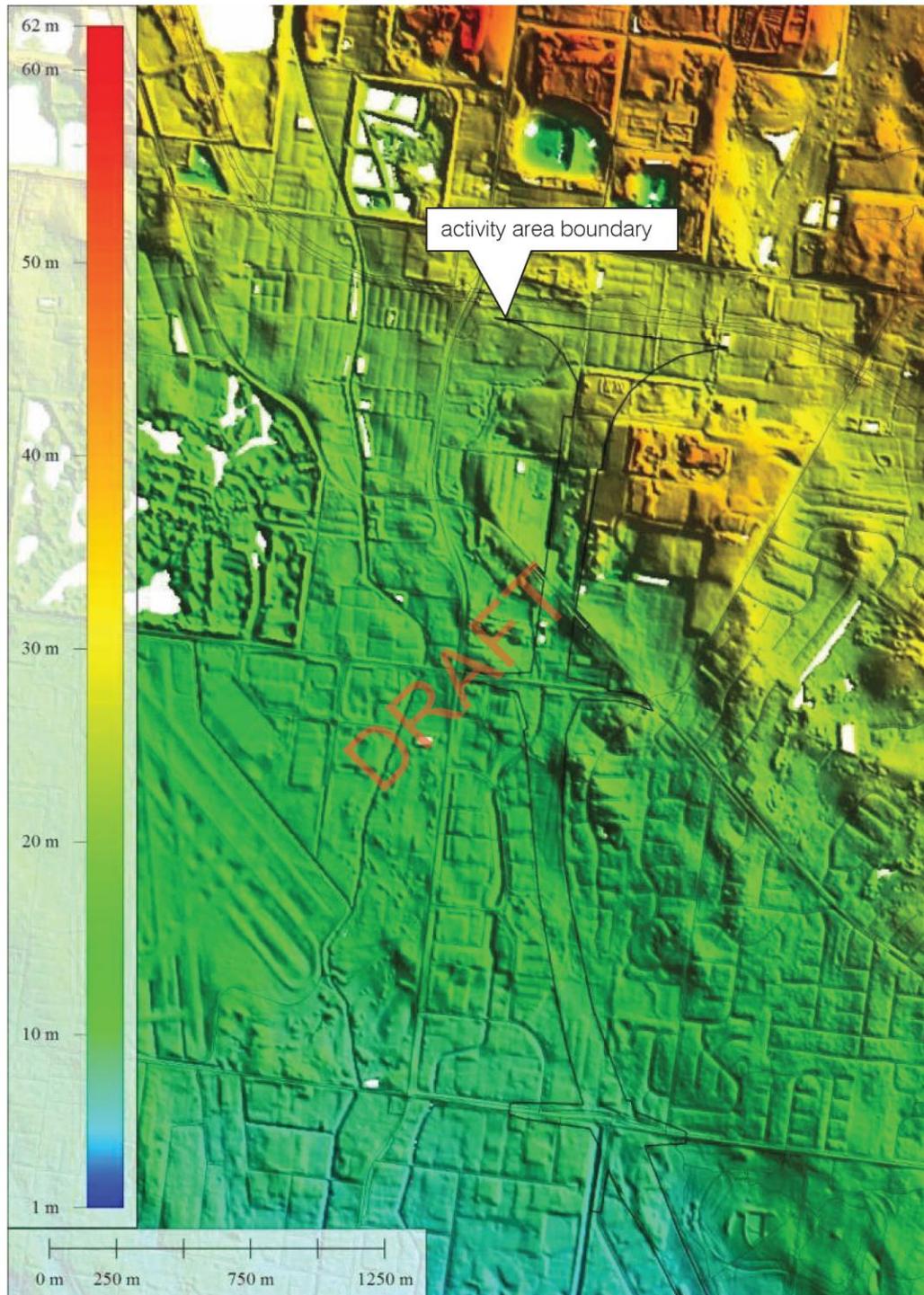


Figure 13a Activity Area Lidar Image (North)

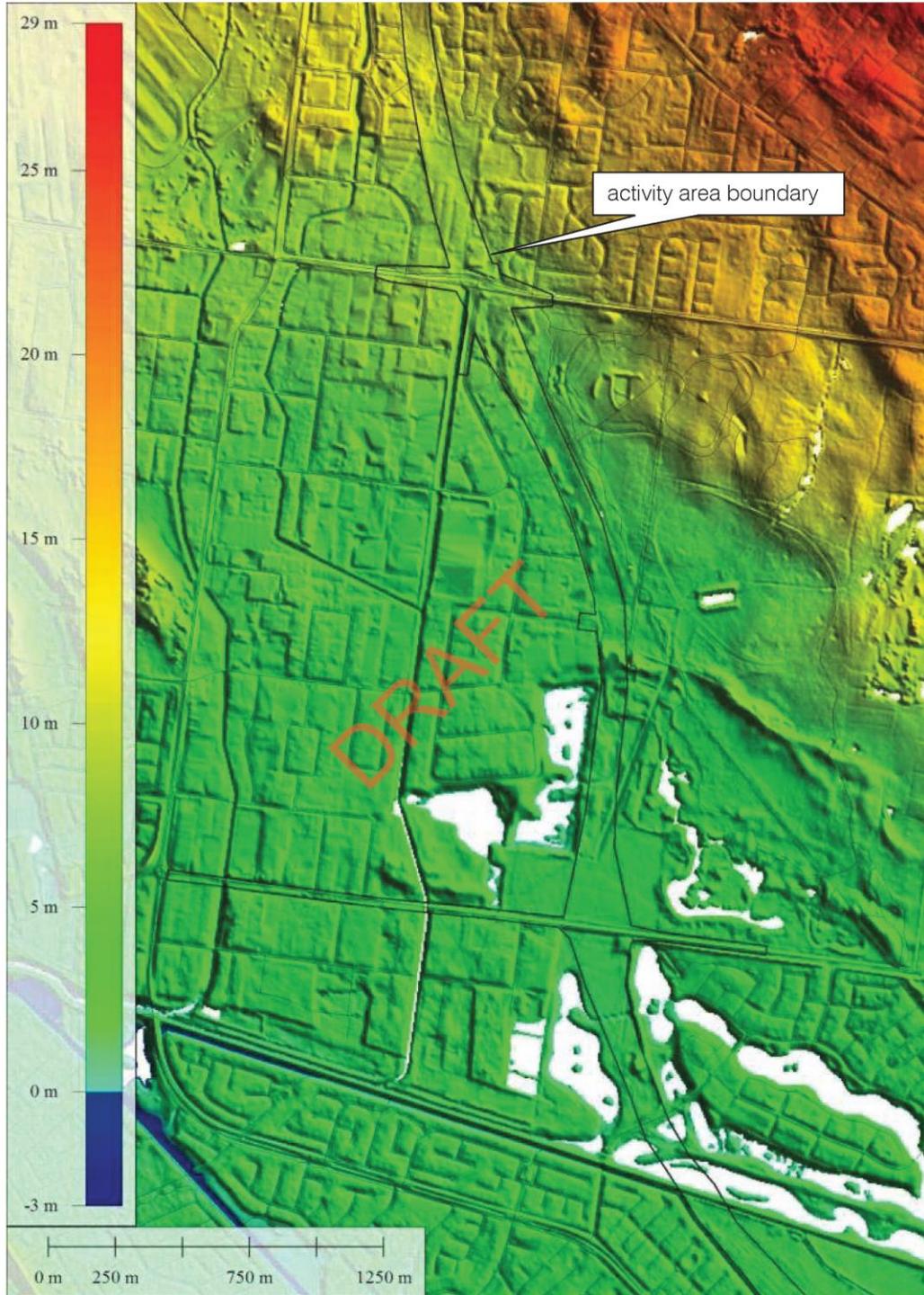


Figure 13b Activity Area Lidar Image (Centre)

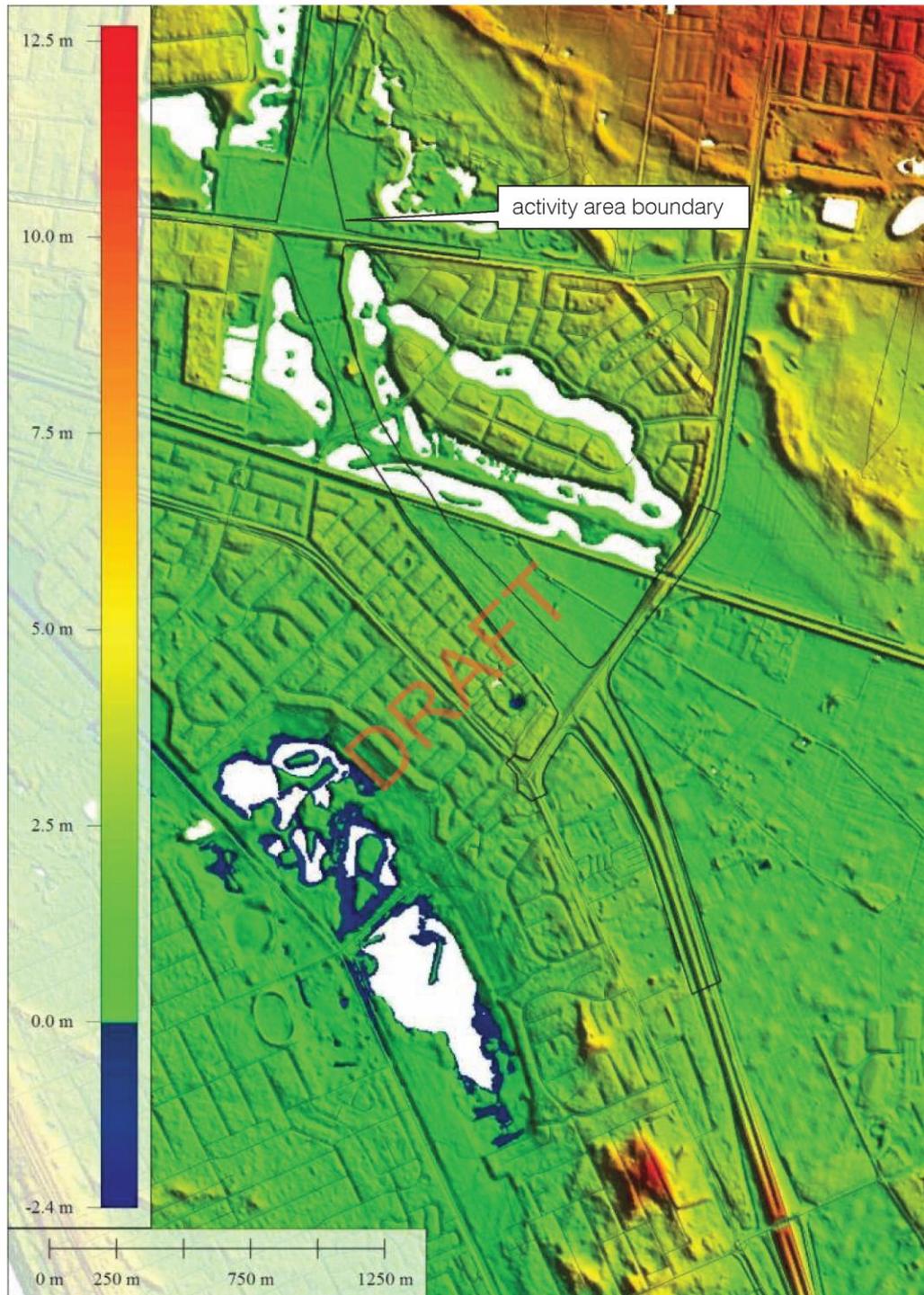


Figure 13c Activity Area Lidar Image (South)

Appendix 2: Heritage Place Report (provided by Sponsor) – Braeside Park (Hermes Number 114505)

HERITAGE PLACE REPORT

Kingston City
 Name Braeside Park Heritage Overlay No
 Address Lower Dandenong Road BRAESIDE VIC 3195
 Property No
 Building Type Parks, Gardens and Trees / Other - Parks, Gardens & Trees VHR Number N/A
 III Number N/A
 File Number
 Heritage Status Recommended for Heritage Overlay
 Precinct
 Hermes Number 114505



HERITAGE PLACE REPORT

Kingston City
 Maker/Builder
 No Information Recorded
 Statement of Significance
 Braeside Park is of historical and technological significance at a local level. Although substantially altered to provide Park and Wildlife habitat, it retains a number of early key elements of historical significance from its period as a pastoral property including the race track. It retains other elements from the period as an MMBW sewage treatment plant including settling basin, substation, and administration buildings that are of historical and some technological significance.

Heritage Study Kingston - City of Kingston Heritage Study Author Bryce Raworth P/L Year 2001 Grading
 Designer/Architect No Information Recorded Architectural Style No Information Recorded

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HERITAGE PLACE REPORT

Kingston City

Place History

Braeside Park covers an area of around 31.2 hectares and extends from Lower Dandenong Road to Governor Road. It is currently a public recreational space operated by Parks Victoria. The area was once home to the Boon Wurrang (also spelt Boonwurrung or Bunurong) people who occupied an area from Morfhalloo to the Anderson Inlet on Westernport Bay, including the Mornington Peninsula and inland to land near Warragul. Six scar trees on the site are evidence of their occupation.¹ The early explorers Hume and Hovell traversed the Carrum Carrum Swamp area in February 1827. The first Europeans to settle in the area included Michael Solomon and his family who arrived in 1840. Other settlers such as Farquhar McCree, Cl J De Villiers, Major James Fraser and James Horsfall quickly followed. Solomon became insolvent in 1842 and Charles and James Lunax Beswick took over part of the run, which included the current Braeside Park area. They held the license for two years until George Keys took over in 1844. When the government revoked squatting licenses in 1851 George Keys was given the opportunity to purchase some of the land that he had previously worked.²

Today, Braeside Park covers most of the original three allotments purchased by members of the Keys family, namely, Lot 1 & 2 of Section 21 and Lot 2 of Section 22.3 The Keys were a highly influential family in the area who owned large tracts of land from the Carrum Swamp to Brighton. Robert Keys, one of the first owners of Braeside Park, also owned the Exchange Hotel at Cheltenham and was active in local politics.⁴ Over time the Keys sold their land with Lot 2 Section 22 going to David Syme in 1902 and Lot 1 Section 21 to Syme's son, Arthur Edward Syme in 1915. David Syme is remembered as the owner of *The Age* newspaper. His son Arthur was a surgeon. With David Syme's death, Arthur became owner of the entire parcel of land. Lot 2 Section 21 was extensively subdivided and had been divided into four different allotments by c.1900. It appears that two of these were purchased by Frederick William Werritt, who used the land for market gardening purposes.⁵

Dr Arthur Syme developed his land as a large racehorse training complex located near the corner of Springvale Road. He constructed stables for 20 horses, quarters for his employees, a grass track and a sand track. His trainer, Adam Skirving, lived in the residence built by the Keys. There was a bungalow for the foreman, a bunkhouse for other employees, a shower house and various outbuildings for storage of equipment.⁶ Syme and Werritt sold their properties to the MMBW in 1928.7 The MMBW had planned to construct a new sewage treatment plant to service the suburbs to south and east of Melbourne. Opposition to the scheme quickly emerged with people worried that outfall from the scheme would pollute Port Phillip Bay and become a threat to health.⁸ However, due to protests and the depression⁹ work did not commence immediately and the MMBW offered the land to tenants. The tenants included horse trainer Harry Telford who occupied the former Syme property and market gardener Frederick Werritt who leased back the property (part of Lot 2 Section 21) that he had sold to the MMBW. Telford paid £800 per year to use the facilities constructed by Syme. He employed 25 people as gardeners, farmhands, stable boys and apprentices. Telford is famous as the trainer of 1930 Melbourne Cup winner Phar Lap, who trained on the site for a small period during in 1930/31. In 1940 Ernest John Willmott took over the lease on the horse training section of the property. Willmott and his family lived in the Keys residence which had at this stage been extended from the original four rooms. Other elements on the property included the Canadian cedar stables, an underground tank, four raised water tanks, milking sheds and other buildings. During this period, an extensive garden with varieties of fruit trees and ornamental plants occupied a part of the site.¹⁰

To ease pressure on the Werribee sewage treatment plant, the MMBW commenced construction of a facility at Braeside park in 1939. The plant was built mostly by day labour and opened by then Premier, Edwin Dunstan in October 1940. It was initially designed to cope with sixteen thousand people but later expanded to service around 60 thousand people.¹¹ The sewage was biologically treated using a series of tanks and lagoons. Raw sewage was filtered through crushed rock in concrete holding tanks near the pump house. Then the effluent was purified before being evaporated from lagoons.¹² Or the purified effluent was used to

Braeside Park

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HERITAGE PLACE REPORT

Kingston City

irrigate the surrounding MMBW owned land. The land was leased for sheep grazing. This type operation was common throughout the world during the interwar years.¹³

Higher than expected population growth after WWII forced revision of the city's sewerage scheme. Various feasibility studies began including a scheme to pump untreated sewage from a pumping station at Carrum into the ocean at Cape Shanek. This scheme was rejected in favour of constructing a new pumping station at Brooklyn and enlargement of the Braeside and Outfall Sewer operations.¹⁴ In the mid 1950s Braeside was expanded and small neighbourhood treatment plants were constructed. However confined growth placed a strain on the sites. In 1964 the board decided to build a major treatment plant near Carrum to treat all sewage from the eastern zone. Construction was delayed until the late 1960s due to financial constraints and the need for investigation of the environmental and health issues.¹⁵ This new plant eventually made Braeside obsolete.¹⁶ The Braeside treatment plant eventually closed in 1981.¹⁷

With the Braeside sewage treatment plant (and several others) decommissioned, various future uses were suggested by community groups. The MMBW decided to develop the area as a public park and nature reserve, preserving remnant MMBW buildings and other MMBW sites.¹⁸ It was anticipated that the park would create an urban escape of open spaces and landscape features while protecting natural areas. Around 770 acres were developed as a park¹⁹ which opened in April 1989.²⁰ The former Keys residence was demolished and the stables were destroyed by fire in 1982.²¹

This is a very large site, which is used as a public park. It is largely covered with native or replanted vegetation. The site has an avenue of large pine trees, which was planted in the late 1930s along the entrance avenue to the Pumping Station. The original pumping station building (c.1939) is used by the park staff as an office. This building is constructed from red brick in a Streamlined Moderne style. It features brick quoins, a parapeted gable with brick detailing and strong horizontal emphasis. The building has new some windows. Other sites of interest include a remnant settling pond with concrete outlet and inlets in place, a substation, some pumping machinery, the former MMBW Chlorine Store and Surveyors Markings. Several new buildings have been erected on the northern side of the park for public use and interpretation of the site. A permanent installation dealing with the issue of Aboriginal reconciliation has been erected beside the remnant settling pond.

1 Context Pty Ltd, *Braeside Park Cultural Values Assessment Review, July 2002*, p.1, 15.

2 Context Pty Ltd, p.3.

3 *Mordialloc, County of Bourke Crown Portion Subdivision Map*, First Edition 8th December 1884 and

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Subdivision Map, Second Revised Edition, c.1900.

4 Graham Whitehead, Personal Communication, 1 November 2002.

5 Graham Whitehead, Personal Communication, 29 October 2002.

6 Kingston Historical Website. <http://localhistory.kingston.vic.gov.au> 'A Racing Establishment at Braeside'

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7 Kingston Historical Website.

8 T Dingle & C. Rasmussen, *Vital Connections*, 1990, p.161.

9 Kingston Historical Website.

10 Kingston Historical Website.

11 Sign on site near pumping station.

12 Sign on site near pumping station.

13 T Dingle & C. Rasmussen, p.200-201.

14 T Dingle & C. Rasmussen, p.216.

15 T Dingle & C. Rasmussen, p.293.

16 Sign on site near pumping station.

17 Parks Victoria. Braeside Park Website. <http://www.parkweb.vic.gov.au>

18 Sign on site near pumping station.

19 T Dingle & C. Rasmussen, p.328.

20 Parks Victoria. Braeside Park Page.

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HERITAGE PLACE REPORT

Kingston City

21 Kingston Historical Website.

Description

Integrity

Altered Sympathetically

Physical Conditions

See History

References

No Information Recorded

Branside Park

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