

Appendix M

Technical working paper:
Aboriginal heritage

NorthConnex

Building for the future



Technical working paper: Aboriginal heritage

Technical Working Paper: Aboriginal Cultural Heritage

NorthConnex

Client: Roads and Maritime Services

ABN: 76 236 371 088

Prepared by

AECOM Australia Pty Ltd

Level 21, 420 George Street, Sydney NSW 2000, PO Box Q410, QVB Post Office NSW 1230, Australia

T +61 2 8934 0000 F +61 2 8934 0001 www.aecom.com

ABN 20 093 846 925

25-May-2014

AECOM in Australia and New Zealand is certified to the latest version of ISO9001, ISO14001, AS/NZS4801 and OHSAS18001.

© AECOM Australia Pty Ltd (AECOM). All rights reserved.

AECOM has prepared this document for the sole use of the Client and for a specific purpose, each as expressly stated in the document. No other party should rely on this document without the prior written consent of AECOM. AECOM undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. This document has been prepared based on the Client's description of its requirements and AECOM's experience, having regard to assumptions that AECOM can reasonably be expected to make in accordance with sound professional principles. AECOM may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified. Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.

25-May-2014

Quality Information

Document Technical Working Paper: Aboriginal Cultural Heritage

Ref p:\60300684_m2-f3_ta\6. aecom – ta\4. tech work area\4.1 environment\06. specialists\02. final reports\aboriginal heritage\rev 3 (exhibition)\20140524 aboriginal heritage technical working paper - rev 3_rms.docx

Date 25-May-2014

Prepared by Dr Darran Jordan

Reviewed by Luke Kirkwood

Revision History


Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
1	14-Apr-2014	Final for issue - Unrestricted	Scott Jeffries Associate Director - Environment	Original signed
2	15-May-2014	Final for exhibition	Scott Jeffries Associate Director - Environment	Original signed
3	25-May-2014	Final for exhibition	Scott Jeffries Associate Director - Environment	

Table of Contents

Glossary of terms and abbreviations	i
Executive summary	iii
1.0 Introduction	1
1.1 The project	1
1.2 Project location	5
1.3 Purpose of this report	5
1.4 Study area	9
1.5 Structure of this report	9
2.0 Legislative considerations	11
2.1 Commonwealth legislation	11
2.1.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984	11
2.1.2 Environment Protection and Biodiversity Conservation Act 1999	11
2.1.3 Native Title Act 1993	12
2.2 State legislation	12
2.2.1 Environmental Planning and Assessment Act 1979	12
2.2.2 Director General's Environmental Assessment Requirements	13
2.2.3 National Parks and Wildlife Act 1974	13
3.0 Methodology	15
3.1 Aboriginal representative consultation	16
4.0 Summary and analysis of background information	17
4.1 Landform and topography	17
4.2 Hydrology	17
4.3 Soils	18
4.4 Flora and fauna	18
4.5 Ethnographic context	18
4.6 Archaeological context	19
4.6.1 NSW Aboriginal Heritage Information Management System (AHIMS)	19
4.6.2 Previous archaeological surveys and excavations	25
4.7 Aboriginal site prediction model	28
4.7.1 Rockshelters	28
4.7.2 Art sites/engravings	28
4.7.3 Grinding grooves	28
4.7.4 Stone artefact scatters	28
4.7.5 Isolated artefacts	28
4.7.6 Modified trees	28
5.0 Results	29
5.1 Field Inspection	29
5.1.1 Transect 1 – King Road & Burdett Street, Hornsby	33
5.1.2 Transects 2 and 3 – Coonanbarra Road, North Wahroonga	37
5.1.3 Transect 4 – Coonanbarra Road, Wahroonga	39
5.1.4 Transect 5 – Kingsley Close, Wahroonga	43
5.1.5 Transect 6 – Mount Pleasant Avenue to Lucinda Avenue, Normanhurst	47
5.1.6 Transect 7 – Blantyre Close, Thornleigh	51
5.1.7 Transect 8 – Observatory Park, Beecroft	51
5.1.8 Transect 9 – Orchard Road, Beecroft	57
5.1.9 Transect 10 – Bidjigal Reserve, northern side of Hills M2 Motorway, West Pennant Hills	61
5.1.10 Transect 11 – Haines Avenue to Yale Close, North Rocks	66
5.1.11 Transect 12 – Perry Street to Hills M2 Motorway, Baulkham Hills	67
5.1.12 Transect 13 – Randall Crescent to Ventura Road, Baulkham Hills	71
5.1.13 Transect 14 – Ventura Road to Renown Road, Baulkham Hills	71
5.2 Ground-truthing AHIMS registered sites	77
5.3 Outcomes of aboriginal representative consultation	82
5.4 Management Zones	83
6.0 Summary of constraints	89

7.0	Summary of Findings & Recommendations	91
7.1	Management recommendations	91
8.0	Conclusion	93
9.0	References	95
Appendix A		
	GTLAC report	A
Appendix B		
	AHIMS register search results	B
Appendix C		
	Archaeological scientific ratings	C

List of tables

Table 1	Aboriginal Representative Attendance for 2013 Field Inspections	16
Table 2	AHIMS search results	20
Table 3	Previous archaeological investigations within 16 km of the study area	25
Table 4	Transect details for the site inspections completed in September, October and December 2013	29
Table 5	Visual inspection results	73
Table 6	AHIMS Registered Sites within project corridor	78
Table 7	Sites in proximity to Hills M2 Motorway integration works	79
Table 8	Ground surface visibility (GSV rating scheme)	C-1
Table 9	Ground integrity (GI) rating scheme	C-1
Table 10	Archaeological sensitivity rating scheme	C-1
Table 11	Impact risk rating scheme	C-1

List of figures

Figure 1	The project	3
Figure 2	The PACHCI process (Roads and Maritime, 2011)	7
Figure 3	AHIMS Database search area	21
Figure 4	Results of the AHIMS database searches	23
Figure 5	Transect overview	31
Figure 6	Transects 1, 2 & 3	35
Figure 7	Transect 4	41
Figure 8	Transect 5	45
Figure 9	Transect 6	49
Figure 10	Transect 7	53
Figure 11	Transect 8	55
Figure 12	Transect 9	59
Figure 13	Transects 10 and 11	63
Figure 14	Transects 12, 13 and 14	69
Figure 15	Area of archaeological sensitivity 1	85
Figure 16	Area of archaeological sensitivity 2 within proximity to the project	87

List of plates

Plate 1	Transect 1, paved access road	33
Plate 2	Transect 1, outcrops and bush area	33
Plate 3	Transect 1, pipe across creek	33
Plate 4	Transect 1, culvert	33
Plate 5	Transect 2, concrete channel	37
Plate 6	Transect 2, confluence of two concrete channels	37

Plate 7	Transect 2, motorway culvert	38
Plate 8	Transect 2, channel cutting	38
Plate 9	Transect 2, pipeline	38
Plate 10	Transect 2, waterfall	38
Plate 11	Transect 2, bike track and rubbish	38
Plate 12	Transect 2, Storm water pollution trap	38
Plate 13	Transect 3, residential backyard	39
Plate 14	Transect 3, Cockle Creek behind Carrington Park	39
Plate 15	Transect 4, modified channel of Cockle Creek	39
Plate 16	Transect 4, modified channel of Cockle Creek	39
Plate 17	Transect 5, adjoining residential backyards	43
Plate 18	Transect 5, adjoining M1 Pacific Motorway	43
Plate 19	Transect 6, tributary of Coups Creek	47
Plate 20	Transect 6, stormwater drains	47
Plate 21	Transect 6, modified drainage line	47
Plate 22	Transect 6, modified drainage line adjacent to road	47
Plate 23	Transect 7, cemented channel	51
Plate 24	Transect 7, brick wall	51
Plate 25	Transect 8, outer area	57
Plate 26	Transect 8, central area	57
Plate 27	Transect 9, path adjacent to tributary	57
Plate 28	Transect 9, tributary adjacent to raised section of Hills M2 Motorway	57
Plate 29	Transect 10, outcrops at location of AHIMS #45-6-2097	65
Plate 30	Transect 10, graffiti on overhang at location of AHIMS #45-6-2097	65
Plate 31	Transect 10, graffiti on overhang at location of AHIMS #45-6-2163	65
Plate 32	Transect 10, overhang at location of AHIMS #45-6-2163	65
Plate 33	Transect 10, rockshelter with potential deposit, view west at location of AHIMS #45-6-2160	65
Plate 34	Transect 10, rockshelter with potential deposit, view east at location of AHIMS #45-6-2160	65
Plate 35	Transect 10, Blue Gum Creek	66
Plate 36	Transect 10, Allen Madden at culvert on Blue Gum Creek next to Hills M2 Motorway	66
Plate 37	Transect 10, disturbed corridor immediately adjacent to Hills M2 Motorway	66
Plate 38	Transect 10, view south toward Hills M2 Motorway	66
Plate 39	Transect 11, Andrew McLaren and Tracey Howie at culvert	67
Plate 40	Transect 11, drain utility hole	67
Plate 41	Transect 11, modified slope	67
Plate 42	Transect 11, adjacent to Hills M2 Motorway, view east	67
Plate 43	Transect 12, access track between houses and Hills M2 Motorway	68
Plate 44	Transect 12, adjacent to Hills M2 Motorway	68
Plate 45	Transect 12, concrete drainage line	68
Plate 46	Transect 12, beneath Hills M2 Motorway adjacent to modified channel of Darling Mills Creek	68
Plate 47	Transect 13, bush reserve with tracks	71
Plate 48	Transect 13, bush reserve with tracks	71
Plate 49	Transect 14, stormwater drains	72
Plate 50	Transect 14, M2 motorway overhead with support pylons, maintenance access track and modified channel for Darling Mills Creek	72
Plate 51	AHIMS #45-6-0923 (no picture on site card for comparison)	80
Plate 52	AHIMS #45-6-2548/45-5-0886 - additional small overhang area adjacent to main section with graffiti	80
Plate 53	AHIMS #45-6-2548 – 1992 picture from site card	80
Plate 54	AHIMS #45-6-2548 – 2013 inspection	80
Plate 55	AHIMS #45-6-2543 – 2009 picture from site card	81
Plate 56	AHIMS #45-6-2543 – 2013 inspection	81
Plate 57	AHIMS #45-6-2544 – 2009 picture from site card	81
Plate 58	AHIMS #45-6-2544 – 2013 inspection	81

Plate 59	AHIMS #45-6-2542 with two campfire areas, firewood and graffiti – 2013 inspection (no picture on site card for comparison)	81
Plate 60	AHIMS #45-6-2542 graffiti detail – 2013 inspection	81
Plate 61	Rockshelter site at 315149mE 6262073mN – 2013 inspection – no Aboriginal artefacts	82
Plate 62	Rockshelter at 315097mE 6262155mN – 2013 inspection – no Aboriginal artefacts	82

Glossary of terms and abbreviations

Term	Meaning
AHIMS	Aboriginal Heritage Information Management System.
Archaeological potential	The likelihood of undetected surface and/or subsurface archaeological materials existing at a location.
Aboriginal archaeological site	The present spatial extent of visible Aboriginal archaeological material(s) at a given location.
Artefact	Any object which has been physically modified by humans.
BP	Before Present.
Exposure	An area where the ground surface is visible, usually as the result of thinner vegetation cover, erosive forces or human-caused disturbance. In archaeological surveys, the percentage of ground surface that is visible is recorded. These percentages of exposure are then used to calculate effective coverage.
Ground Surface Visibility (GSV)	A term used to describe the area of the ground's surface that is visible during archaeological field surveys.
In situ	In the natural or original position. Applied to a rock, soil, or fossil when occurring in the situation in which it was originally formed or deposited.
OEHS	NSW Office of Environment and Heritage.
PACHCI	The Roads and Maritime Services Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI).
Potential Archaeological Deposit	PAD is the hypothesised presence of archaeological deposit where there is uncertainty due to a lack of visibly eroding artefacts, lack of test excavation either locally or in analogous landforms in the region.
Roads and Maritime	Roads and Maritime Services.
Stone artefact	Any piece of rock modified by human behaviour.

This page has been left blank intentionally.

Executive summary

Roads and Maritime Services (Roads and Maritime) is proposing to construct and operate a tolled motorway linking the M1 Pacific Motorway at Wahroonga to the Hills M2 Motorway at West Pennant Hills in northern Sydney (NorthConnex). NorthConnex (the project) would comprise road tunnel(s) generally following the alignment of Pennant Hills Road. At the northern and southern end of the project, interchanges would connect the tunnels to the M1 Pacific Motorway, the Hills M2 Motorway, Pennant Hills Road and the Pacific Highway.

On 18 October 2013, the project was declared by the Minister for Planning and Infrastructure to be State significant infrastructure and critical State significant infrastructure. As such, Roads and Maritime is seeking approval for the project under Part 5.1 of the *Environmental Planning and Assessment Act 1979*. On 29 October 2013, the Director-General's environmental assessment requirements for the project were issued on 29 October 2013, and re-issued with amendments on 11 April 2014. The DGRs included a requirement to undertake an assessment of potential impacts of the project on Aboriginal cultural heritage.

The project follows the general alignment of Pennant Hills Road between the M1 Pacific Motorway and the Hills M2 Motorway. It crosses through the suburbs Northmead, Baulkham Hills, North Rocks, Carlingford, West Pennant Hills, Pennant Hills, Beecroft, Normanhurst, and Wahroonga. This area consists of highly modified slopes, with existing road, business and residential areas having heavily disturbed the natural landscape. It has been subject to a variety of past disturbances, including vegetation clearance, road construction, infrastructure development, creek/drainage line modification and the development of multiple business and residential properties. However, large tracts of vegetation remain in the region, at Bidjigal Reserve located next to the Hills M2 Motorway and Ku-ring-gai National Park to the north of the project.

To inform this assessment, targeted field inspections of areas within or in proximity to the project were undertaken on 24-25 September 2013, 2 October 2013 and 19 December 2013 with representatives of the Metropolitan Local Aboriginal Land Council and Guringai Tribal Link Aboriginal Corporation. Areas for inspection were based on areas of potential archaeological sensitivity and the potential areas of disturbance by the project. Areas of potential archaeological sensitivity were informed by existing Aboriginal Heritage Information Management System (AHIMS) sites, proximity to water sources and levels of past disturbance. Sites located in proximity to the study area were also ground-truthed during the inspections.

No specific Aboriginal archaeological heritage values were identified during these inspections outside existing AHIMS site areas, within the exception of two management zone areas, being:

- An area of archaeological sensitivity, containing three valid registered AHIMS sites and the potential for further sites, located in the southern portion of the study area adjacent to the Hills M2 Motorway integration works. This area is referred to in this report as ASA1 (Archaeological Sensitivity Area 1) management zone. The area is adjacent to Blue Gum Creek and contains numerous outcrops and rock overhangs.
- An area containing two rockshelter sites and overhangs near Darling Mills Creek and located north of the Hills M2 Motorway, adjacent to the Hills M2 Motorway integration works. There is also potential for further Aboriginal archaeological sites to be located in this area. This area is referred to in this report as ASA2 (Archaeological Sensitivity Area 2) management zone.

The construction footprint for the project would not extend into either ASA1 or ASA2 management zones.

Based on the results of the targeted inspections of the study area, it was concluded that a detailed cultural heritage impact assessment is not required for this project. Nonetheless, mitigation and management measures are recommended:

- The detailed design of the project should be developed to avoid direct impacts on the ASA1 and ASA2 management zones and previously identified archaeological sites.
- The identified rockshelter sites and overhangs located in proximity to the Hills M2 Motorway integration works should be clearly delineated prior to construction works to avoid inadvertent impacts during construction.
- During construction, vibration monitoring would be conducted for vibration intensive works within 50 metres of rockshelter sites and associated overhangs associated with ASA2 management zone to ensure that the rockshelter sites and overhangs are not adversely affected. The need for vibration monitoring would be informed by a preliminary screening of activities at this location to identify what activities have the potential

for vibration at the areas of sensitivity. The preliminary screening and works requiring monitoring would be contained within the construction environmental management plan.

- If impacts on Aboriginal heritage sites or areas of archaeological sensitivity cannot be avoided, then it is recommended that the assessment progress to Stage 3 of the Roads and Maritime PACHCI process for formal consultation (Roads and Maritime, 2011).
- The AHIMS database should be updated through submission of site cards and ASIR card/s prior to works commencing. This should provide the data gathered during the field inspections carried out to inform this assessment so that the latest coordinate and condition data is accurate within the AHIMS register.
- In the event that additional areas outside of those inspected as part of this assessment are identified as having potential for Aboriginal heritage and the potential for disturbance as a result of the project, then the need for additional Stage 2 assessments should be reviewed.
- If an Aboriginal object(s) or human remains are discovered during construction and the discovery should be managed in accordance with the Roads and Maritime standard management procedure Unexpected Archaeological Finds (July, 2012).

1.0 Introduction

1.1 The project

Roads and Maritime Services (Roads and Maritime), is seeking approval under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to construct and operate a tolled motorway linking the M1 Pacific Motorway at Wahroonga to the M2 Hills Motorway at the Pennant Hills Road interchange at West Pennant Hills in northern Sydney (the project) (refer to **Figure 1**).

Key features of the project would include:

- Twin motorway tunnels up to around nine kilometres in length with two lanes in each direction. The tunnels would be constructed with provision for a possible third lane in each direction if required in the future.
- A northern interchange with the M1 Pacific Motorway and Pennant Hills Road, including sections of tunnel for on-ramps and off-ramps, which also facilitate access to and from the Pacific Highway.
- A southern interchange with the Hills M2 Motorway and Pennant Hills Road, including sections of tunnel for on-ramps and off-ramps.
- Integration works with the Hills M2 Motorway including alterations to the eastbound carriageway to accommodate traffic leaving the Hills M2 Motorway to connect to the project travelling northbound, and the provision of a new westbound lane on the Hills M2 Motorway extending through to the Windsor Road off-ramp.
- Tie-in works with the M1 Pacific Motorway extending to the north of Edgeworth David Avenue.
- A motorway operations complex located near the southern interchange on the corner of Eaton Road and Pennant Hills Road that includes operation and maintenance facilities.
- Two tunnel support facilities incorporating emergency smoke extraction outlets and substations.
- Ancillary facilities for motorway operation, such as electronic tolling facilities, signage, ventilation systems and fire and life safety systems including emergency evacuation infrastructure.
- Modifications to service utilities and associated works at surface roads near the two interchanges and operational ancillary facilities.
- Modifications to local roads, including widening of Eaton Road near the southern interchange and repositioning of the Hewitt Avenue cul-de-sac near the northern interchange.
- Ancillary temporary construction facilities and temporary works to facilitate the construction of the project.

Construction of the project is anticipated to commence in early 2015 and is expected to take around four years to complete.

On 18 October 2013, the project was declared by the Minister for Planning and Infrastructure to be State significant infrastructure and critical State significant infrastructure.

This page has been left blank intentionally.

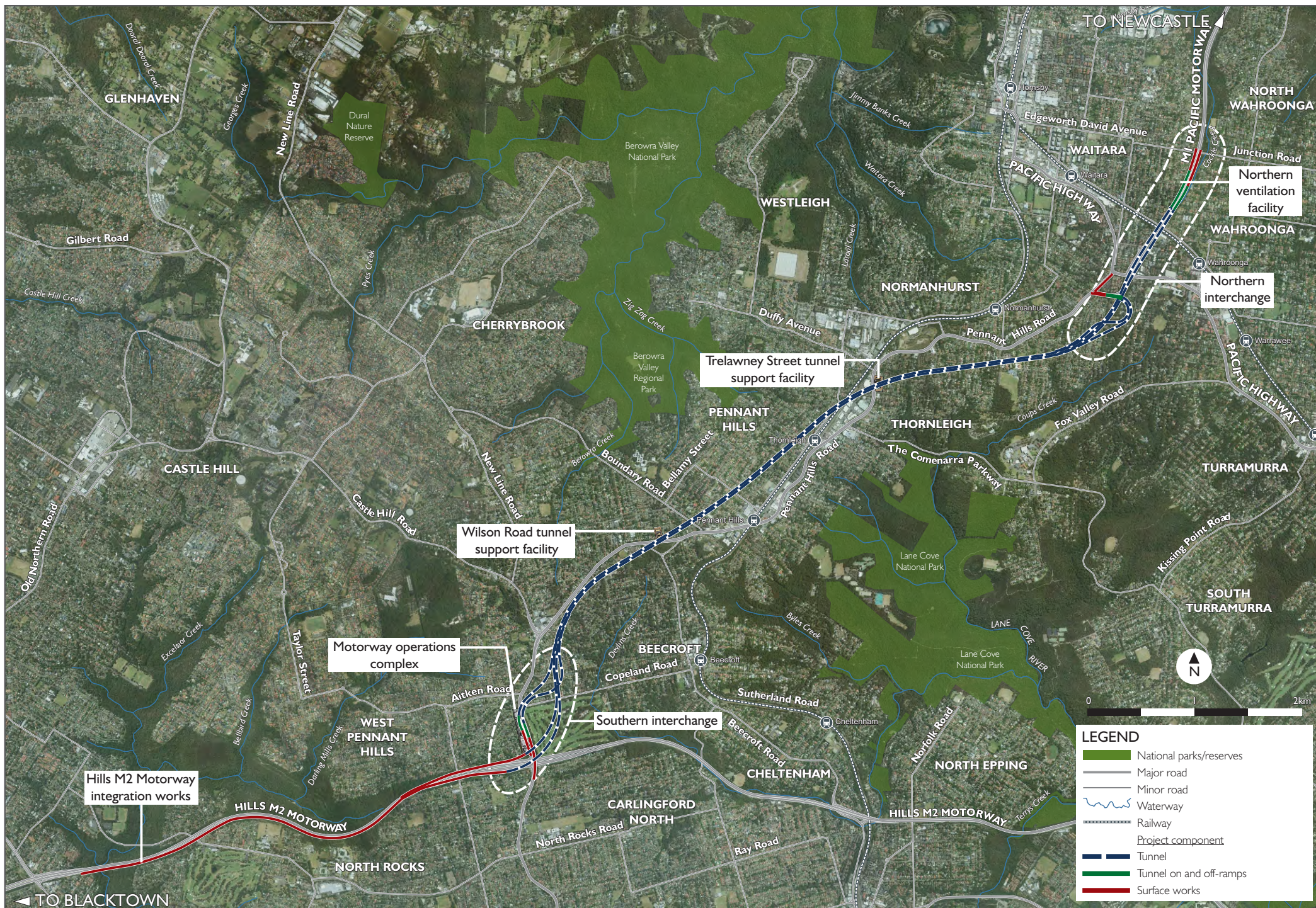


Figure 1 The project

This page has been left blank intentionally.

1.2 Project location

The project would consist of underground tunnels generally following the alignment of Pennant Hills Road between the M1 Pacific Motorway and the Hills M2 Motorway. It would span the suburbs of Wahroonga, Normanhurst, Thornleigh, Pennant Hills, Beecroft, West Pennant Hills, Carlingford, North Rocks, and Baulkham Hills.

The majority of the area in which the project is located consists largely of highly modified slopes, with existing roads, businesses and residential areas having heavily disturbed the natural landscape. The area has been subject to a variety of past disturbances, including vegetation clearance, road construction, infrastructure development, creek/drainage line modification and the development of multiple businesses and residential properties. However, large tracts of vegetation remain at Bidjigal Reserve located next to the Hills M2 Motorway and Ku-ring-gai National Park to the north of the project.

1.3 Purpose of this report

The Director-General's environmental assessment requirements (DGRs) for the project were issued on 29 October 2013, and were re-issued with amendments on 11 April 2014. The DGRs have informed the preparation of the environmental impact statement for the project. The DGRs include the following requirements specific to potential impacts on Aboriginal cultural heritage:

- An assessment of the potential Aboriginal cultural heritage impacts of the project, including an assessment of objects, places of significance, natural and landscape values of the corridor and surrounding area, taking into account the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC, July 2005).
- Demonstrate effective consultation with Aboriginal communities in determining and assessing impacts and developing and selecting options and mitigation measures (including the final proposed measures).

This technical working paper presents the assessment on the potential impacts on Aboriginal cultural heritage as a result of the project. This assessment has been undertaken in accordance with the DGRs and the Roads and Maritime procedure for Aboriginal cultural heritage consultation and investigation, abbreviated as the PACHCI process (Roads and Maritime, 2011) (refer to **Figure 2**).

The PACHCI process is a staged approach to assessment and consultation, compiled specifically for Aboriginal archaeological assessments on Roads and Maritime projects. Stages 1 and 2 of the PACHCI process align with the OEH Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW, 2010). Stage 3 of the PACHCI represents the preparation of a detailed cultural heritage impact assessment and consultation with Aboriginal stakeholders as part of that assessment. Stage 3 aligns with the OEH guideline Aboriginal Cultural Heritage Consultation requirements for proponents (the 2010 consultation guideline) (DECCW, 2010).

As discussed later in this report, the assessments undertaken in accordance with the PACHCI process concluded that the assessment did not need to advance to the preparation of a detailed cultural heritage impact assessment (a Stage 3 assessment).

This page has been left blank intentionally.

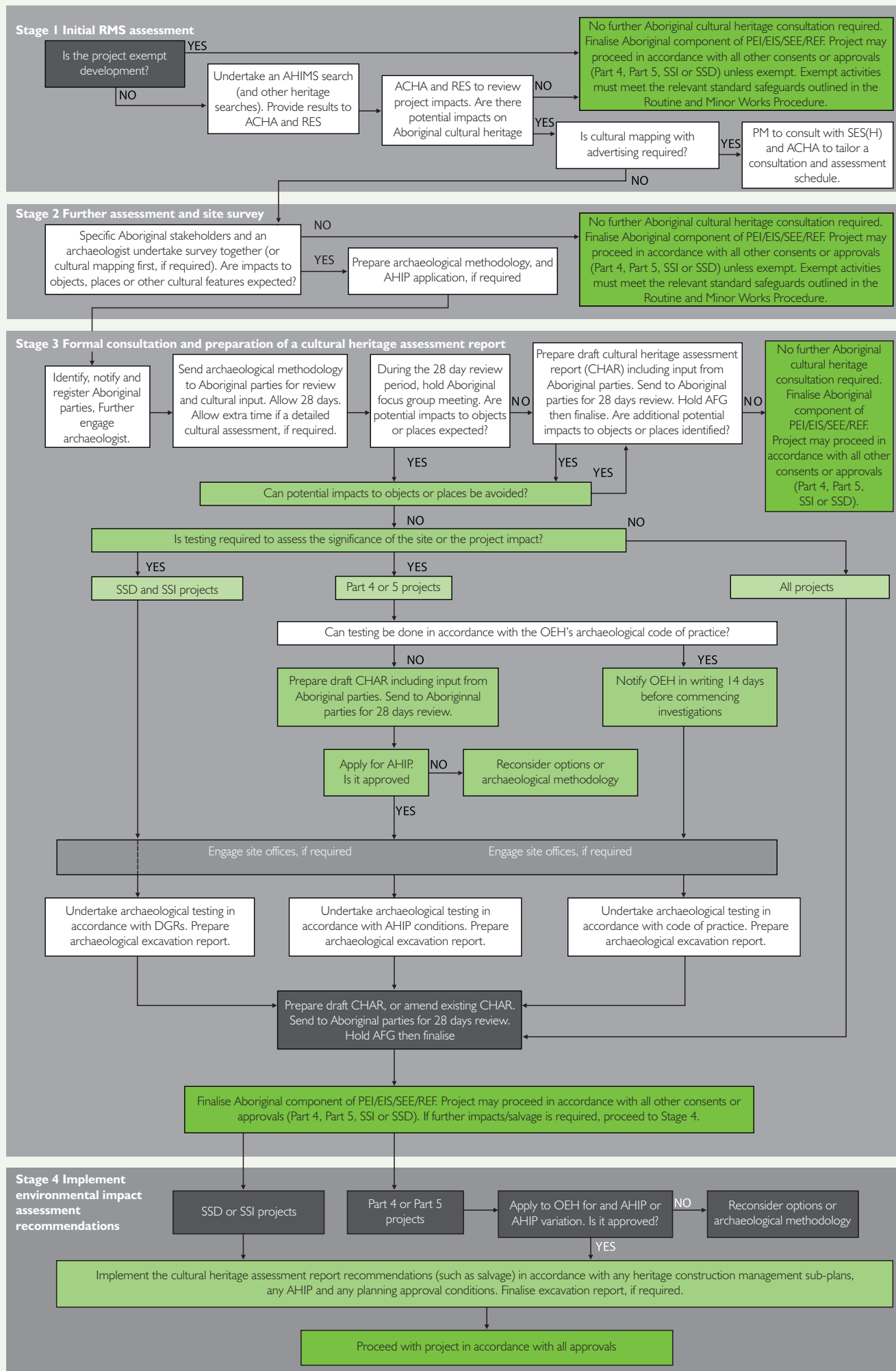


Figure 2 The PACHCI process (Roads and Maritime Services, 2011)

This page has been left blank intentionally.

1.4 Study area

The study area for this assessment has been informed by:

- Areas of potential archaeological sensitivity based on water sources, past disturbances and existing sites listed in Aboriginal Heritage Information Management System (AHIMS) register, administered by the Office of Environment and Heritage (OEH).
- The preferred tender design, as summarised in **Section 1.1** of this report, and as detailed further in Chapter 5 of the environmental impact statement for the project.
- The preferred project corridor, which represents a zone on the surface equal to a distance of 50 metres from the outer edge of the underground tunnels.
- The construction footprint of the project with a 200 metre buffer. The construction footprint represents the area that would be physically impacted by construction works, including all construction ancillary facilities.

The operational footprint of the project is no larger than the construction footprint (and in some cases, it is smaller). For the purpose of this report, the construction footprint assessed reflects the worst case disturbance footprint for direct impacts at the surface.

The preferred tender design and construction footprint of the project as assessed within this technical working paper represent the preferred tender design. Sufficient flexibility has been provided in the preferred tender design to allow for refinement during detailed design, or to minimise environmental impacts, or in response to submissions received during the exhibition of the environmental impact statement. The final design may therefore vary from the project as described and assessed within this technical working paper.

1.5 Structure of this report

This report has the following structure:

Chapter 1 introduces the project.

Chapter 2 details the legislative considerations relevant to the project and Aboriginal heritage.

Chapter 3 details the methodology for the assessment.

Chapter 4 provides a summary and analysis of background information.

Chapter 5 details the results of the archaeological assessment.

Chapter 6 summarises the constraints of the project and study area.

Chapter 7 provides recommendations for the project.

Chapter 8 provides a conclusion for the assessment.

Chapter 9 provides the references used to assist in the preparation of this report.

This page has been left blank intentionally.

2.0 Legislative considerations

Several planning and legislative documents govern how heritage is managed in NSW. The following section provides an overview of the requirements under each as they apply to the project.

2.1 Commonwealth legislation

2.1.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (the ATSIHP Act) provides for the preservation and protection of places, areas and objects of particular significance to Indigenous Australians. The stated purpose of the ATSIHP Act is the 'preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition' (section 4).

Under the ATSIHP Act, 'Aboriginal tradition' is defined as "the body of traditions, observances, customs and beliefs of Aboriginals generally or of a particular community or group of Aboriginals, and includes any such traditions, observances, customs or beliefs relating to particular persons, areas, objects or relationships" (section 3). A 'significant Aboriginal area' is an area of land or water in Australia that is of 'particular significance to Aboriginals in accordance with Aboriginal tradition' (section 3). A 'significant Aboriginal object', on the other hand, refers to an object (including Aboriginal remains) of like significance.

For the purposes of the ATSIHP Act, an area or object is considered to be injured or desecrated if:

In the case of an area:

- It is used or treated in a manner inconsistent with Aboriginal tradition.
- The use or significance of the area in accordance with Aboriginal tradition is adversely affected.
- Passage through, or over, or entry upon, the area by any person occurs in a manner inconsistent with Aboriginal tradition.

In the case of an object:

- It is used or treated in a manner inconsistent with Aboriginal tradition.

The ATSIHP Act can prevail over State and Territory laws in situations where a state or territory has approved an activity, but the Commonwealth Minister prevents the activity from occurring by making a declaration to protect an area or object. However, the Minister can only make a decision after receiving a legally valid application under the ATSIHP Act and, in the case of long term protection, after considering a report on the matter. Before making a declaration to protect an area or object in a state or territory, the Commonwealth Minister must consult the appropriate Minister of that State or Territory (section 13).

2.1.2 Environment Protection and Biodiversity Conservation Act 1999

Under Part 9 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), any action that is likely to have a significant impact on a matter of National Environmental Significance may only be carried out with the approval of the Commonwealth Minister for the Environment.

An action is defined as a project, development, undertaking, activity, series of activities, or alteration.

An action will also require approval if:

- It is undertaken on Commonwealth land and will have or is likely to have a significant impact.
- It is undertaken outside Commonwealth land and will have or is likely to have a significant impact on the environment on Commonwealth land.
- It is undertaken by the Commonwealth and will have or is likely to have a significant impact.

The EPBC Act defines 'environment' as both natural and cultural environments and therefore includes Aboriginal and historic heritage items. Under the EPBC Act, protected heritage items are listed on the National Heritage List (items of significance to the nation) or the Commonwealth Heritage List (items belonging to the Commonwealth or its agencies). These two lists replaced the Register of the National Estate (RNE). The RNE has been suspended and is no longer a statutory list.

2.1.3 Native Title Act 1993

Native title is the recognition in Australian law that some Indigenous Australians continue to hold rights to their land and waters, which come from their traditional laws and customs. The *Native Title Act 1993* provides for the recognition and protection of native title rights and interests. The native title rights and interests held by particular Indigenous Australians depend on both their traditional laws and customs and what interests are held by others in the area concerned.

Section 8 of the *Native Title Act 1993* states that the Act is not intended to affect the operation of any law of a State or Territory that is capable of operating concurrently with the Act.

A search of the register maintained by the National Native Title Tribunal indicates that there is one native title claim that has been registered with respect to land within the area of the project (reference NC2013/002). The application has been made by the Awabakal and Guringai People. The project would not directly affect Crown land that is the subject of the native title claim.

In accordance with the PACHCI, a representative from the Guringai Tribal Link Aboriginal Corporation participated in the site inspection and was consulted as part of this assessment (refer to **Section 3.1** and **Section 5.3**).

2.2 State legislation

2.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) provide the framework for environmental planning in NSW and include provisions to ensure that proposals that have the potential to impact on the environment are subject to an appropriate level of assessment. The EP&A Act and EP&A Regulation also provide opportunity for public involvement in the environmental impact assessment process. In NSW, environmental impacts are interpreted as including impacts on cultural heritage.

Roads and Maritime is seeking approval for the project under Part 5.1 of the EP&A Act. The project has been declared to be State significant infrastructure and critical State significant infrastructure.

Development consent is not required for the project pursuant to the provisions of the *State Environmental Planning Policy (Infrastructure) 2007*.

The following Local Environmental Plans (LEPs) or Planning Scheme Ordinances apply to the study area:

- *Hornsby Local Environment Plan 2013*.
- *The Hills Local Environmental Plan 2012*.
- *Ku-ring-gai Planning Scheme Ordinance 1971*.

These instruments require consent to be granted when:

- Demolishing or moving a heritage item, Aboriginal object, building, work, relic or tree within a heritage conservation area.
- Altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in the applicable Schedule of the LEP or Ordinance.
- Disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed.
- Disturbing or excavating an Aboriginal place of heritage significance.
- Erecting a building on, or subdividing, land on which a heritage item is located or that is within a heritage conservation area.

However, as noted the project is permissible without development consent. Therefore consent is not required by the local councils under Part 4 of the EP&A Act.

2.2.2 Director General's Environmental Assessment Requirements

As discussed in **Section 1.3**, the Director-General's environmental assessment requirements (DGRs) for the project were issued on 29 October 2013 and re-issued with amendments on 11 April 2014. Regarding Aboriginal cultural heritage, the DGRs require that the environmental impact statement includes:

- An assessment of the potential Aboriginal cultural heritage impacts of the project, including an assessment of objects, places of significance, natural and landscape values of the corridor and surrounding area, taking into account the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC, July 2005).
- Demonstrate effective consultation with Aboriginal communities in determining and assessing impacts and developing and selecting options and mitigation measures (including the final proposed measures).

Consultation has been undertaken for this assessment in order to obtain information on the potential cultural impacts of the project. The inspection methodology has been aligned with the PACHCI process and corresponds to the due diligence process of the Code of Practice. Representatives from the Guringai Tribal Link Aboriginal Corporation (GTLAC) and Metropolitan Local Aboriginal Land Council (MLALC) were engaged by Roads and Maritime to take part in the targeted inspections and to provide input into the assessment on the potential Aboriginal cultural heritage impacts of the project.

2.2.3 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act), administered by the Office of Environment and Heritage (OEH), is the primary legislation for the protection of Aboriginal cultural heritage in NSW. The NPW Act gives the Director-General of OEH responsibility for the proper care, preservation and protection of 'Aboriginal objects' and 'Aboriginal places', defined under the Act as follows:

- Article I. An *Aboriginal object* is any deposit, object or material evidence (that is not a handicraft made for sale) relating to Aboriginal habitation in NSW, before or during the occupation of that area by persons of non-Aboriginal extraction (and includes Aboriginal remains).
- Article II. An *Aboriginal place* is a place declared so by the Minister administering the NPW Act because the place is or was of special significance to Aboriginal culture. It may or may not contain Aboriginal objects.

Part 6 of the NPW Act provides specific protection for Aboriginal objects and places by making it an offence to harm them. Under Part 5 of the EP&A Act, an Aboriginal Heritage Impact Permit (AHIP) must be obtained if impacts to Aboriginal objects and/or places are anticipated. AHIPs are issued under section 90 of the NPW Act. Consultation with Aboriginal communities is required under OEH policy when an application for an AHIP is considered and is an integral part of the permit process. AHIPs may be issued in relation to a specified Aboriginal object, Aboriginal place, land, activity or person or specified types or classes of Aboriginal objects, Aboriginal places, land, activities or persons. An AHIP is not required if the development is approved under Part 5.1 of the EP&A Act. However, a commensurate level of assessment as would otherwise be required for an AHIP is nonetheless typically required for assessment under Part 5.1 of the EP&A Act.

Section 89A of the NPW Act requires notification of the location of identified Aboriginal objects within a reasonable time, with penalties for non-notification, including daily penalties. Section 89A is binding in all instances. It should be noted that the NPW Act includes a strict liability offence whereby a person may be prosecuted for harming an Aboriginal object even when the person was not aware that the object was an Aboriginal object and when the Aboriginal object may have been harmed unknowingly.

This page has been left blank intentionally.

3.0 Methodology

The methodology for this assessment has been developed as per the requirements of the PACHCI guideline. The analysis of Aboriginal heritage constraints for this project included:

- A desktop review of the project and surrounding area in order to identify previously recorded sites of Aboriginal heritage significance and areas with the potential for archaeological sensitivity.
- Stage 2 consultation in accordance with the Roads and Maritime PACHCI process with the Metropolitan Local Aboriginal Land Council (MLALC) and the Guringai Tribal Link Aboriginal Corporation (GTLAC), as facilitated by Clive Freeman, Aboriginal Cultural Heritage Officer for Roads and Maritime.
- Development and use of predictive mapping. The predictive mapping has been based on the information gathered through the desktop review and the consultation feedback, and assisted in defining the study area for the project. This was then used to focus the site inspection to areas of potential archaeological and cultural sensitivity.
- Field inspections held on 24-25 September 2013, 2 October 2013 and 19 December 2013 to ground-truth items of Aboriginal cultural heritage identified during the desktop review, and to identify surface expressions of Aboriginal archaeological and cultural heritage values (including cultural landscape values) within the targeted areas of potential archaeological sensitivity. Areas were inspected with attention to their capacity to contain Aboriginal archaeological deposits. All outcrops were inspected for grooves and engravings; all mature trees were inspected for signs of modification.

The field inspections were completed across four days, with the following participants:

- September and October 2013 – AECOM archaeologists, Dr Darran Jordan, Dr Andrew McLaren and Rochelle Coxon, a Metropolitan Local Aboriginal Land Council (MLALC) representative Allen Madden and a Guringai Tribal Link Aboriginal Corporation (GTLAC) representative Tracey Howie.
- December 2014 - AECOM archaeologists, Dr Darran Jordan and Rochelle Coxon, and a Metropolitan Local Aboriginal Land Council (MLALC) representative Allen Madden.

Each site inspection involved:

- A combined vehicle and pedestrian inspection of the study area of 14 transects.
- Ground-truthing of previously registered AHIMS Aboriginal sites located within the bounds of or in proximity to the study area, according to the search result coordinates and site cards provided by OEH.
- Taking notes throughout the site inspection, detailing landform, ground surface visibility and areas of exposure. Data was recorded on a hand-held GPS and photographs were taken.

The representatives from the MLALC and GTLAC were invited to submit a report on their findings of the site inspection(s) for incorporation into the formal Roads and Maritime reporting on the site inspection results (referred to as a Stage 2 PACHCI report).

Consultation with the MLALC and GTLAC is discussed further in **Section 3.1** and **Section 5.3**.

- Identification and mapping of previously recorded sites and areas of Aboriginal archaeological potential based on the field inspection to determine the potential impact on these sites and areas and if further assessment in accordance with the PACHCI is required.
- Development of a draft archaeological testing methodology, should a Stage 3 PACHCI assessment be required.

As discussed in **Chapter 5.0** and **Chapter 6.0** of this report, it was concluded that there would be no impacts as a result of the project on Aboriginal archaeological sites, areas of archaeological sensitivity or areas that have cultural value. As such, the assessment did not advance to further field investigations or consultation with the Aboriginal community.

3.1 Aboriginal representative consultation

Aboriginal representatives are in the best position to provide information on the Aboriginal social/cultural heritage values of a given area, including the cultural landscape values. It is not appropriate for non-Aboriginal people to assess or comment on cultural values. Representatives from the Metropolitan Local Aboriginal Land Council (MLALC) and Guringai Tribal Link Aboriginal Corporation (GTLAC) participated in the site inspections held in late 2013.

Consultation was undertaken in accordance with Stage 2 of the PACHCI, which aligned with the OEH Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW, 2010). Details of field attendance are summarised in **Table 1**.

Table 1 Aboriginal Representative Attendance for 2013 Field Inspections

Date	24 September 2013	25 September 2013	2 October 2013	19 December 2013
MLALC Attendee	NA	Allen Madden	Allen Madden	Allen Madden
GTALC Attendee	Tracey Howie	Tracey Howie	Tracey Howie	NA

Both representatives provided verbal feedback during the field inspections, which was considered in this assessment. The representatives were invited to provide a report or comments detailing their findings of the inspections for consideration in the assessment of the potential impacts of the project. Further detail on the results of this consultation is discussed in **Section 5.3**.

As detailed later in this report, it is concluded that no impacts to Aboriginal objects, places or cultural features would occur as a result of the project. As such, no further consultation or investigation was required. This is consistent with the OEH Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW, 2010).

4.0 Summary and analysis of background information

Environmental factors such as topography, hydrology, geology, soils, flora and fauna would have been key influences on past Aboriginal occupation and land use, as well as archaeological site patterning and distribution, site survival over time, and the likelihood of detecting any extant archaeological sites. Any attempt to predict or interpret the character and distribution of Aboriginal sites in a given landscape must consider these environmental factors, along with historic and current land use practices, to enable predictions to be made concerning the likely presence or absence of sites in a given area and, where appropriate, their archaeological integrity.

4.1 Landform and topography

The geology of the project and surrounding area includes the Mittagong Formation which separates the Wianamatta Group and underlying Hawkesbury Sandstone Formation (NSW Department of Mineral Resources, 1983). The topography of the study area includes multiple landform types, including slopes, crests, ridges, rugged to rolling steep hills, rock outcrops, hillcrests, valleys, creeks and creek banks (Chapman & Murphy, 1989). The natural landforms throughout the study area have been highly disturbed by development, with natural formations heavily modified.

As well as extensive residential development in each of the suburbs within the study area, there has also been a long period of development and use of the road network linking them. The principal thoroughfares through the study area are the M1 Pacific Motorway and Pennant Hills Road, which have both supported and facilitated development and landscape modification within the study area. Pennant Hills Road links the suburbs within northern Sydney, and principally, Carlingford, West Pennant Hills, Pennant Hills, Thornleigh, Westleigh, Beecroft, Normanhurst and Wahroonga.

Pennant Hills Road began as a bullock track for timber transportation before being developed under Governor Macquarie's administration between 1810 and 1821 as a public road (NSW Government State Records Authority of New South Wales, 2013; The Hills Shire Council, 2013). Either side of the road along its extent are now situated connecting roads, businesses and residential areas as well as associated urban infrastructure. While the majority of the study area has been heavily disturbed through development, some natural landforms are still present in the wider region in parks and reserves, including:

- Bidjigal Reserve verges on a section of bush within the southern portion of the project.
- Pennant Hills Park is located to the south of the central portion of the project.
- Lane Cove National Park is located to the east of the project.
- Ku-ring-gai Chase National Park is located to the north of the northern-most extent of the project.
- Smaller park areas, reserves and associated creek lines are present within the bounds of the project.

4.2 Hydrology

The project is predominantly located within the Hawkesbury-Nepean catchment, with its southern portions located within the Upper Parramatta River Catchment. Both the Hawkesbury-Nepean Catchment and the Upper Parramatta River Catchment have been modified due to development across the wider region and the waterways in multiple areas are currently enclosed by stone banks and concrete along their extent, rather than the natural creek banks. Water flow is generally higher in the Hawkesbury Sandstone areas, while the Wianamatta Shale country creeks have very little water flow during dry weather periods (Upper Parramatta River Catchment Trust, 2002).

The area is rich with natural water sources which would have provided both drinking water and resource foods for Aboriginal peoples. The primary areas of hydrology within the study area include Blue Gum Creek, Devlins Creek, Berowra Creek, Tedburn Creek, Scout Creek, Cockle Creek and Darling Mills Creek (located in proximity to areas inspected for this assessment). In addition to these creeks, a number of drainage lines and unnamed tributaries also occur, some verging on the Lane Cove Valley area, located between Pennant Hills and West Pymble.

4.3 Soils

The southern and western portions of the project are underlain by Wianamatta Shales of the Cumberland Plain, while the north east portions are underlain by Hawkesbury Sandstone. The majority of the project is underlain by the Glenorie erosional landscape, which is characterised by podzolic soils subject to high levels of erosion. Crests contained red podzolic soils of moderate depth, upper slopes contained red and brown podzolic soils of moderate depth, lower slopes contained yellow podzolic soils with deep deposits, while yellow podzolic soils and gleyed podzolic soils occurred along drainage lines (Chapman & Murphy, 1989).

The area also contains smaller portions of Blacktown Residual Landscape and Hawkesbury Colluvial Landscape. The Hawkesbury Landscape is characterised by shallow discontinuous lithosols and siliceous sands, yellow earths and some yellow and red podzolic soils. The Blacktown landscape contains shallow to moderately deep red and brown podzolic soils as well as deep deposits of yellow podzolic soils and soloths on lower slopes and in areas of poor drainage. High levels of soil erosion occur across the majority of the study area, with the Hawkesbury landscape also subject to rock fall and highly permeable soils (Chapman & Murphy, 1989).

4.4 Flora and fauna

The area has been predominantly cleared for road, residential, commercial and industrial development all having significantly altered the biodiversity values of these areas. Plant species include Long Leaf Wattle (*Acacia longissima*), Black Wattle (*Acacia mearnsii*), Spike Acacia (*Acacia oxycedrus*), Burrawang (*Macrozamia communis*), Common Maidenhair (*Adiantum aethiopicum*) and Common Ground Fern (*Calochlaena dubia*) (Australian Government, 2013).

Searches of the NSW Wildlife Atlas and EPBC Protected Matters databases were undertaken for the purposes of the biodiversity assessment for the environmental impact statement (Technical working paper: biodiversity (Eco Logical Australia Pty Ltd, 2014). These searches identified a total of five threatened flora species, 20 threatened fauna species and one endangered population that could potentially occur within the biodiversity study area (being areas that would be disturbed by the project). No threatened fish species have been recorded within the catchments of the study area. Flora and fauna in the area includes species that would have been utilised as traditional Aboriginal food and medicine resources.

4.5 Ethnographic context

The project is located within the traditional country area of the Guringai Aboriginal people. The Guringai are also referred to as Kuringgai, Kurikgai and Kuring-gai. The name Kurikgai was coined by linguist and ethnographer Reverend Dr John Fraser in his introduction to Reverend Lancelot Edward Threlkeld's posthumously published study of language, tradition and custom. Therein Fraser stated: "*we have now come to know that this dialect was essentially the same as that spoken by the sub-tribes occupying the land where Sydney now stands, and that they all formed parts of one great tribe, the Kurikgai*" (Threlkeld, 1892:ii). In detailing the distinction further within the book, Threlkeld wrote using the name Kuringgai, stating: "*The next great tribe is the Kuringgai on the sea coast. Their 'taurai' (hunting ground or territory) is known to extend north to the Macleay River, and I found that southwards it reached the Hawkesbury. Then, by examining the remains of the language of the natives about Sydney and southwards, and by other tests, I assured myself that the country thereabout was occupied by sub-tribes of the Kuringgai*" (Threlkeld, 1892:ix).

The traditional territory of the Guringai stretched from Sydney to Newcastle and inland to the Great Dividing Range (Attenbrow, 2002:33). The area contained such clan groups as the Awaba, Borregegal, Cadigal, Cammeragal/Camaraigal, Garigal, Gayimai and Walkeloa (Gibberagong Environmental Education Centre, 1983:9; J Kohen, 1993). This area was closely bordered by the Darug/Dharug area to the east, the Awabakal and Darkinung areas to the north and north-east and the Turuwal to the south (Horton, 1996). There has been debate regarding the location of the boundary between the Guringai area and the Darug area, with it being defined in the vicinity of Parramatta based on linguistic evidence (Ross, 1988). This is challenged by a counter-argument that the Darug territory extended to the coastline between Port Jackson and Botany Bay, based on the ethnographic observations of explorers and settlers (J Kohen, 1985, 1988; James Kohen & Lampert, 1987). Although language and dialect differed between varying groups, there was enough similarity and commonality through shared words that communication could and did occur (Attenbrow, 2002:33).

The Guringai area was rich in natural resources, containing both coastal and inland areas. Both riverine and coastal areas were utilised for fish and shellfish (oysters, mussels and cockles), as evidenced by the presence of shell middens and fish traps (Ku-ring-gai Council, 2013). Yams, bulbs and seeds were utilised for food, along with the burrawang (macrozamia) nut, fern roots, lillypillies and berries. As well as bush foods, many plants were utilised for their medicinal qualities. Fauna species including possums and birds were hunted, with marine animals such as turtles, dugongs and seals also likely to have been a part of the diet (Gibberagong Environmental Education Centre, 1983:12).

The Guringai utilised hunting tools such as boomerangs, spears and clubs. Fishing spears were made from plant stems with prongs added, made from grass tree flower stems, fish bones or shells and affixed by bees wax and gum (Gibberagong Environmental Education Centre, 1983:14). Fibrous grasses and oyster shell were also utilised to make hooks and fishing lines (Gibberagong Environmental Education Centre, 1983:15). A record of the Guringai living space is also present throughout the traditional country in the form of rock art and engravings. Known motifs include fish, dugong, and human figures. The arrival of European settlers radically transformed the life of the Guringai, as access to land and traditional food resources were blocked by growing settlements and pastoral developments (Gibberagong Environmental Education Centre, 1983:17). In the late 1780s a smallpox epidemic swept through the Guringai people, (Tench, 1793) causing a decline in population numbers in the area.

4.6 Archaeological context

4.6.1 NSW Aboriginal Heritage Information Management System (AHIMS)

The Aboriginal Heritage Information Management System (AHIMS) database, administered by the Office of Environment and Heritage (OEH), contains records of Aboriginal objects reported to the Director-General of the Department of Premier and Cabinet in accordance with section 89A of the *National Parks and Wildlife (NPW) Act 1974*. It also contains information about Aboriginal places which have been declared by the Minister to have special significance with respect to Aboriginal culture. Previously recorded Aboriginal objects and declared Aboriginal places are referred to by AHIMS as 'Aboriginal sites' (NSW Office of Environment & Heritage, 2013).

A search was undertaken of the AHIMS database on 17 July 2013 and 5 December 2013 (AHIMS search #106367 and AHIMS search #118838 respectively) for an area of around nine kilometres by eight kilometres area around preferred project corridor, and an area of around 7.8 kilometres by 10 kilometres along the Hills M2 Motorway integration works (refer to **Figure 3** and **Appendix B**). This search identified 189 registered Aboriginal archaeological sites, noting that the search results included two entries that were not sites. These two items have been excluded from the summary provided in **Table 2**. **Figure 5** shows the sites within proximity to the project.

Past experience with the AHIMS database has identified multiple errors and omissions. Site coordinates are often incorrect in AHIMS search results due to datum changes and estimates based on legacy grid coordinates. Further reference to the original site card recordings combined with ground-truthing to determine site extent (both surface and potential subsurface) would be required to definitively state the distance of recorded sites to the project.

Of the 187 sites identified through the search of the AHIMS database, and accounting for coordinate error, site card duplication and past site destruction, 15 sites have been identified as being within proximity to areas that may be impacted by the project.

Table 2 AHIMS search results

Site type	Number of sites	Percentage of sites
Artefact Scatter	69	37%
Rockshelter	30	16%
Rockshelter with Art	24	13%
Potential Archaeological Deposit (PAD)	20	11%
Grinding Grooves	19	10%
Engraving	13	7%
Isolated Artefact	6	3%
Modified Tree	2	1%
Midden	1	0.5%
Burial	1	0.5%
Quarry	1	0.5%
Water Hole	1	0.5%
TOTAL	187	100%

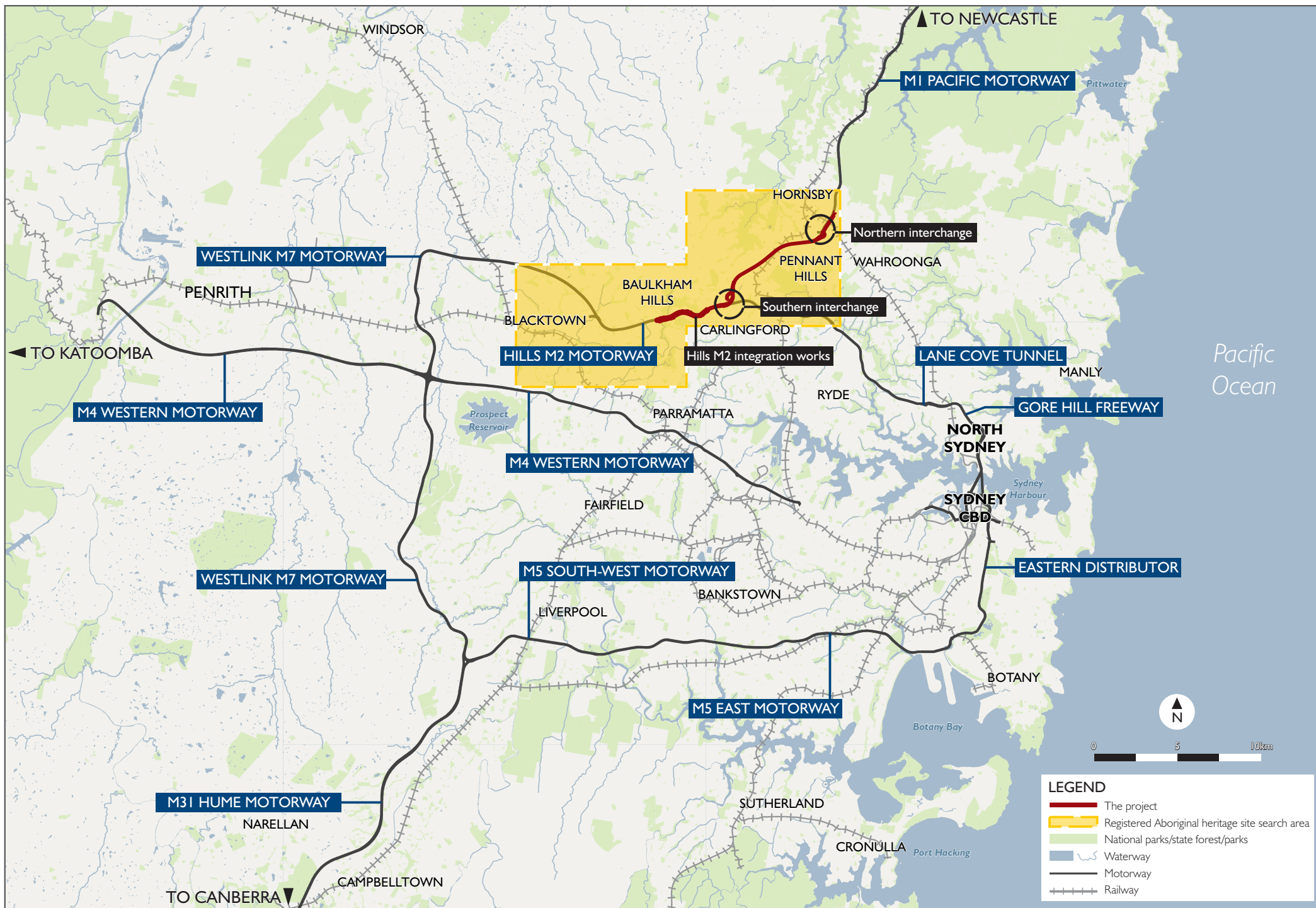


Figure 3 Registered Aboriginal heritage site search area

This page has been left blank intentionally.

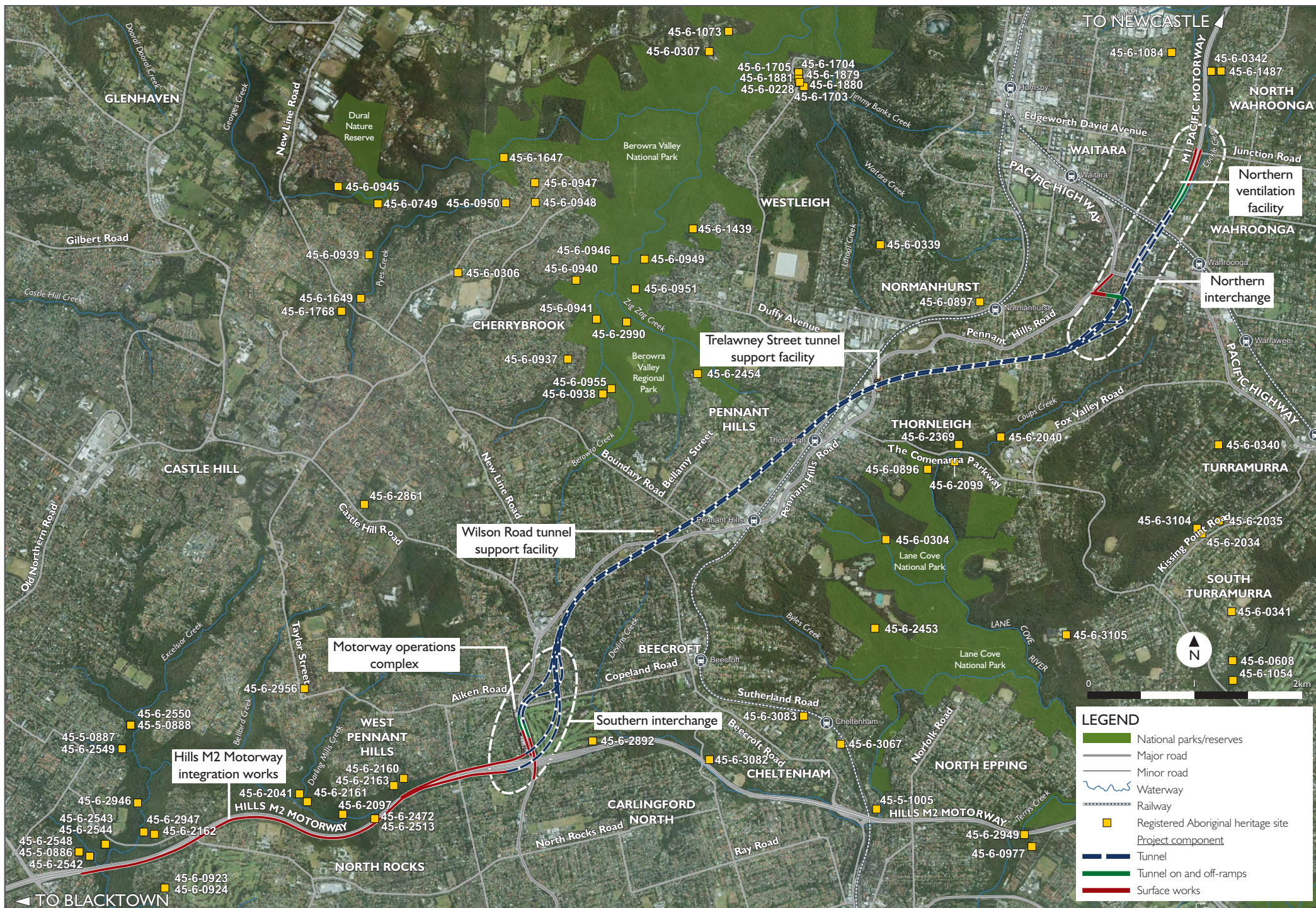


Figure 4 AHIMS database search results

This page has been left blank intentionally.