

Appendix N

Non- Aboriginal Heritage Assessment







Newcastle Power Station

Non-Aboriginal Heritage Assessment

6 June 2019

Project No.: 0468623

Document details	
Document title	Newcastle Power Station
Document subtitle	Non-Aboriginal Heritage Assessment
Project No.	0468623
Date	6 June 2019
Version	1.0
Author	Stephanie Moore, Katherine Deverson, Erin Finnegan
Client Name	Aurecon Group for AGL

Document history

Version	Revision	Author	Reviewed by	ERM approval to issue		Comments
				Name	Date	
Draft	00	K. Deverson	E. Finnegan	Paul Douglass	17/05/2019	
Final	01	K. Deverson	E. Finnegan	Damon Roddis	6 June 2019	

Signature Page

6 June 2019

Newcastle Power Station

Non-Aboriginal Heritage Assessment



James Grieve
Project Manager



Damon Roddis
Partner

Environmental Resources Management Australia Pty Ltd

Level 15

309 Kent Street

Sydney NSW 2000

© Copyright 2019 by ERM Worldwide Group Ltd and / or its affiliates ("ERM").
All rights reserved. No part of this work may be reproduced or transmitted in any form,
or by any means, without the prior written permission of ERM

CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	2
1.1 Objectives	2
1.2 Site Location	2
1.3 Description of Proposed Development	3
1.4 Secretary's Environmental Assessment Requirements (SEARs)	3
1.5 Authorship.....	3
2. LEGISLATION	6
2.1 NSW Legislation	6
2.1.1 NSW Heritage Act 1977	6
2.1.2 Environmental Planning And Assessment Act 1979 (NSW)	6
2.2 Non-Statutory Considerations.....	7
2.2.1 National Trust of NSW	7
2.2.2 The Burra Charter	7
3. HISTORICAL CONTEXT.....	8
3.1 Historical Overview	8
3.1.1 Aboriginal History of Tomago.....	8
3.1.2 Development of the Newcastle Area.....	8
3.1.3 European History of the Tomago Area.....	9
3.2 Historical Heritage Database Searches	15
3.2.1 Australian Heritage Database	15
3.2.2 State Heritage Inventory	15
3.2.3 Local Environmental Plan	15
3.3 Historical Heritage Predictive Model	16
4. PHYSICAL ANALYSIS.....	17
4.1 Field Survey Methodology	17
4.2 Field Survey Results.....	18
4.2.1 Description of the Project Area	18
4.2.2 Survey Coverage	20
4.2.3 Survey Results.....	22
5. ASSESSMENT OF HERITAGE SIGNIFICANCE AND IMPACT ASSESSMENT.....	28
5.1 Assessment of Heritage Significance	28
5.2 Impact Assessment	28
5.2.1 Description of Proposed Activities.....	28
6. CONCLUSIONS AND RECOMMENDATIONS.....	29
6.1 Unexpected Historic Heritage Finds Procedure	29
REFERENCES.....	30
APPENDIX A STOCKTON PARISH MAPS	
APPENDIX B SEARS	

List of Tables

Table 1.1	SEARs (SSI 9837)	3
Table 2.1	NSW State Heritage Significance Criteria	6
Table 3.1	State Listed Heritage Sites near Project Area	15
Table 3.2	LEP Listed Heritage Sites near Project Area	16
Table 4.1	Ground Surface Visibility Rating	17
Table 4.2	Field Survey Attendees	18
Table 4.3	Landform Summary	18
Table 4.4	Survey Coverage	20

List of Figures

Figure 1.1	Site Location	4
Figure 1.2	Proposed Site Layout.....	5
Figure 3.1	Location of Project Area overlaid onto the historical aerial from 1954	12
Figure 3.2	Location of Project Area overlaid onto the historical aerial from 1976	13
Figure 3.3	Location of Project Area overlaid onto the historical aerial from 1993	14
Figure 4.1	Survey Units.....	21

List of Photographs

Photograph 3.1	The Hunter Water Pumping Station erected, c.1939 (Hunter Water, N.D)	9
Photograph 3.2	Hunter Water Pumping Station (ERM 2017).	10
Photograph 3.3	House on western boundary of Project Area (ERM 2019).	11
Photograph 4.1	Western section of Project Area, view to NW (ERM 2019)	19
Photograph 4.2	Central transmission line, view to north (ERM 2019)	19
Photograph 4.3	Remnant or mature regrowth bush area in SU3, view to west from Old Punt Road (ERM 2019).....	20
Photograph 4.4	SU1, view to SE (ERM 2019)	22
Photograph 4.5	Vegetation in SU1 (ERM 2019)	22
Photograph 4.6	Ground visibility on tracks, SU1 (ERM 2019)	22
Photograph 4.7	Section of track clear of vegetation, SU1 (ERM 2019).....	22
Photograph 4.8	Bush area and sealed road in SU2 (ERM 2019)	23
Photograph 4.9	SU2, view to west (ERM 2019).....	23
Photograph 4.10	Vegetation in SU2 (ERM 2019)	23
Photograph 4.11	Ground visibility on tracks, SU2 (ERM 2019)	23
Photograph 4.12	Transmission corridor, SU3 (ERM 2019)	24
Photograph 4.13	Vegetation and ground visibility, SU3 (ERM 2019)	24
Photograph 4.14	Drainage line, SU3, view to west (ERM 2019)	24
Photograph 4.15	Transmission line maintenance track, SU3, view to east (ERM 2019)	24
Photograph 4.16	SU4, view to east from SU3 (ERM 2019).....	25
Photograph 4.17	Vegetation planting, SU4 (ERM 2019)	25
Photograph 4.18	SU4, northern bush area and nesting boxes (ERM 2019)	25
Photograph 4.19	SE corner of SU4 (ERM 2019)	25
Photograph 4.20	SU6, view to west (ERM 2019).....	26
Photograph 4.21	Sand at eastern end of SU5, view to east (ERM 2019).....	26
Photograph 4.22	SU6, view to west from eastern end (ERM 2019)	27
Photograph 4.23	SU6, view to east from western end (ERM 2019)	27
Photograph 4.24	View to south along transmission corridor at western end of SU6 (ERM 2019)	27
Photograph 4.25	Tomago Fire Trail 4, view to north (ERM 2019)	27

EXECUTIVE SUMMARY

Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by Aurecon Group (Aurecon) on behalf of AGL Energy Limited (AGL), to undertake a Non-Aboriginal Heritage Assessment for the site of the proposed Newcastle Power Station and associated pipeline easements and ancillary infrastructure (the Project Area). The Project involves the construction and operation of approximately 250-megawatt (MW) dual-fuel (gas/diesel) power station and associated infrastructure including gas supply and electricity transmission connections.

The Non-Aboriginal Heritage Assessment report comprises background research and desktop assessment, field survey and associated data analysis.

This report aims to:

- *Identify non-Aboriginal heritage resources within the Project Area, including archaeological and built values;*
- *Evaluate the impact of the proposed works on the identified non-Aboriginal heritage resource; and*
- *Provide recommendations for the mitigation of impacts and management of the identified heritage resources.*

A background and desktop historic heritage review was undertaken and the field survey, carried out 6-8 May 2019, was conducted in conjunction with the Aboriginal cultural heritage survey. The Project Area generally consisted of grazing paddocks with dense grass and weeds traversing lower and mid slope, and flat landforms. There was generally a very poor level of ground surface visibility with some ground exposures along tracks. Disturbances observed include the development of fencing, tracks and roads, transmission infrastructure, and vegetation clearance. Several bush areas were also located in the Project Area. Exposures associated with tracks and other disturbances were examined for artefacts and features.

No historic (non-Aboriginal) heritage items were identified within the Project Area, during the desktop assessment or site survey and it is considered unlikely that historic sites or items will be impacted by the Project, however in the unlikely event that historic heritage items are located the implementation of an unexpected find protocol is recommended.

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by Aurecon Group (Aurecon) on behalf of AGL Energy Limited (AGL), to undertake a Non-Aboriginal Heritage Assessment for the site of the proposed Newcastle Power Station, associated pipeline easements associated pipeline easements, and transmission line (the Project Area).

The Non-Aboriginal Heritage Assessment report comprises background research and desktop assessment, field survey and associated data analysis and has been prepared in accordance with the guidelines:

- *The Australia International Council on Monuments and Sites, Charter for Places of Cultural Significance* (also known as the Burra Charter, Australia ICOMOS 2013)
- *Assessing Significance for Historical Archaeological Sites and 'Relics'* (Heritage Branch, Department of Planning 2009);
- NSW Heritage Manual (Heritage Office 2006)
- *Statements of Heritage Impact* (NSW Heritage Office 2002); and
- *Assessing Heritage Significance* (NSW Heritage Office 2001).

The non-Aboriginal heritage report is being prepared to support the proposed construction and operation of a dual-fuel power station in Tomago, described below in *Section 1.3*.

1.1 Objectives

This report aims to:

- Identify non-Aboriginal heritage resources within the Project Area, including archaeological and built values;
- Evaluate the impact of the proposed works on the identified non-Aboriginal heritage resource; and
- Provide recommendations for the mitigation of impacts and management of the identified heritage resources.

1.2 Site Location

The proposed Newcastle Power Station is located in Tomago, NSW, approximately 14 km north-west of Newcastle within the Port Stephens Council Local Government Area (*Figure 1.1*). The Project Area is approximately 96 ha in size and encompasses the following lots:

- Lot 2 DP1043561;
- Lot 3 DP1043561;
- Lot 4 DP1043561 (partial lot);
- Lot 202 DP1173564 (partial lot); and
- Lot 1203 DP1229590 (partial lot).

The north-west boundaries of Lot 2 DP1043561, Lot 3 DP1043561, and Lot 4 DP1043561 as well as the western boundary of Lot 1203 DP1229590 abut the Pacific Highway (*Figure 1.1*). The southern boundaries of Lot 2 DP1043561, Lot 3 DP1043561, and Lot 202 DP1173564 adjoin industrial estates. Lot 202 DP1173564 is bounded to the east and north by lots displaying dense vegetation.

1.3 Description of Proposed Development

AGL proposes to construct and operate a dual-fuel (gas/diesel) power station (approximately 250-megawatt (MW) and associated infrastructure (the Project), including gas supply and electricity transmission connections, in Tomago, NSW. The Project would use open cycle gas turbine (OCGT) or reciprocating gas engine technology able to operate on diesel fuel if necessary. It would operate as a “peaking” facility supplying electricity at short notice during periods of high demand, low supply from intermittent supply sources or when baseload power generation is offline. The Project would connect to the gas supply via a new pipeline(s) to the Newcastle Gas Storage Facility (NGSF) and/or the existing high-pressure gas supply pipeline on Old Punt Road. A high voltage electrical transmission line would connect the Project to the existing TransGrid Tomago 132kV switchyard. The proposed site layout is shown in *Figure 1.2*. The Project is likely to have a minimum operating life of 25 years.

1.4 Secretary’s Environmental Assessment Requirements (SEARs)

SEARs were issued by DP&E on 18 February 2019 and form the basis of the environmental impact assessment for the Project (refer to *Appendix B*).

Table 1.1 provides a summary of the historic heritage related SEARs and includes a reference to where each requirement has been addressed in this report.

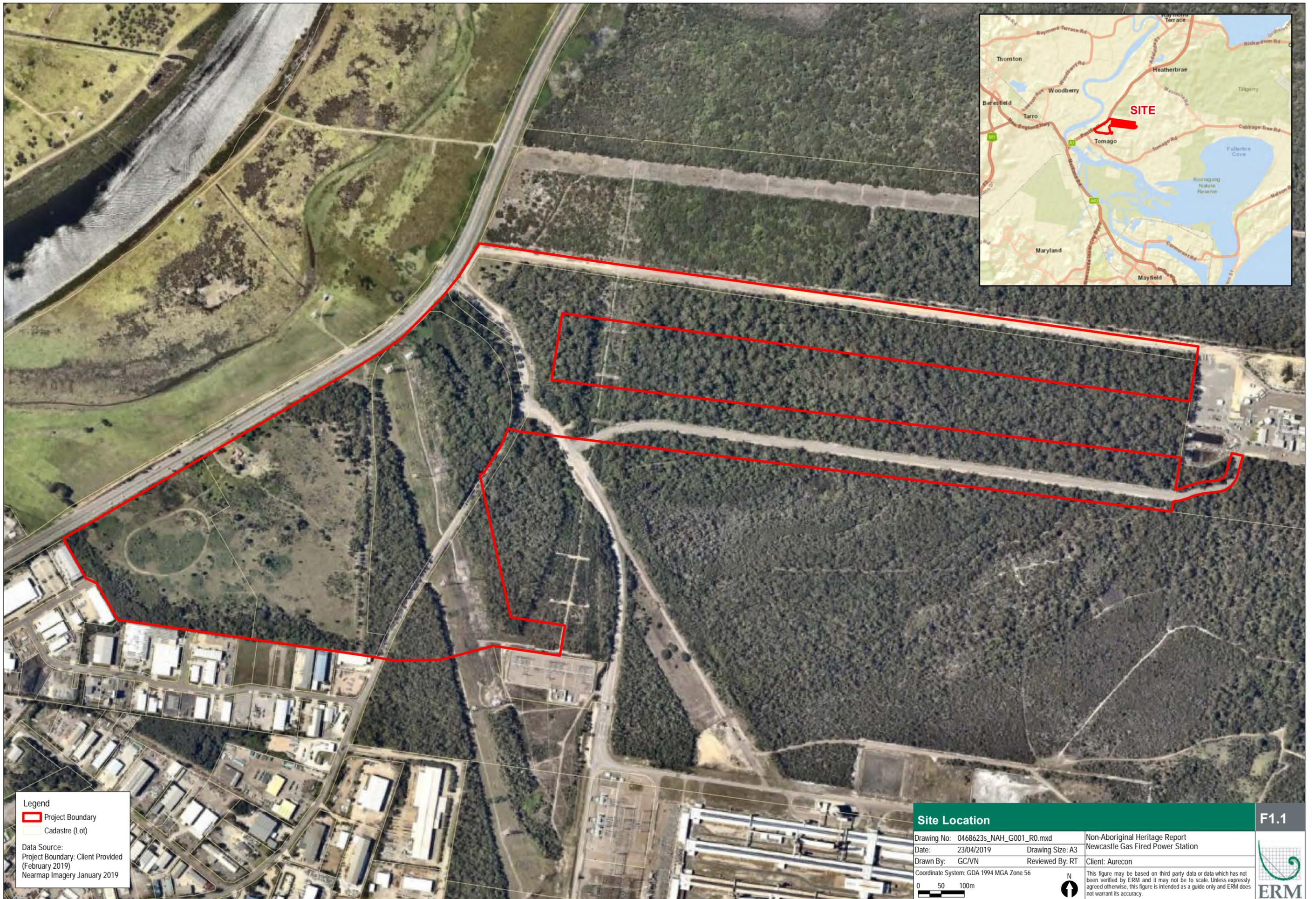
Table 1.1 SEARs (SSI 9837)

Requirement	Location within Report
Heritage – including an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the project, including adequate consultation with Aboriginal stakeholders having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (OEH, 2010);	Historic Heritage – this whole report Aboriginal heritage – see survey report (ERM 2019) and upcoming Aboriginal Cultural Heritage Assessment (separate to this report)

1.5 Authorship

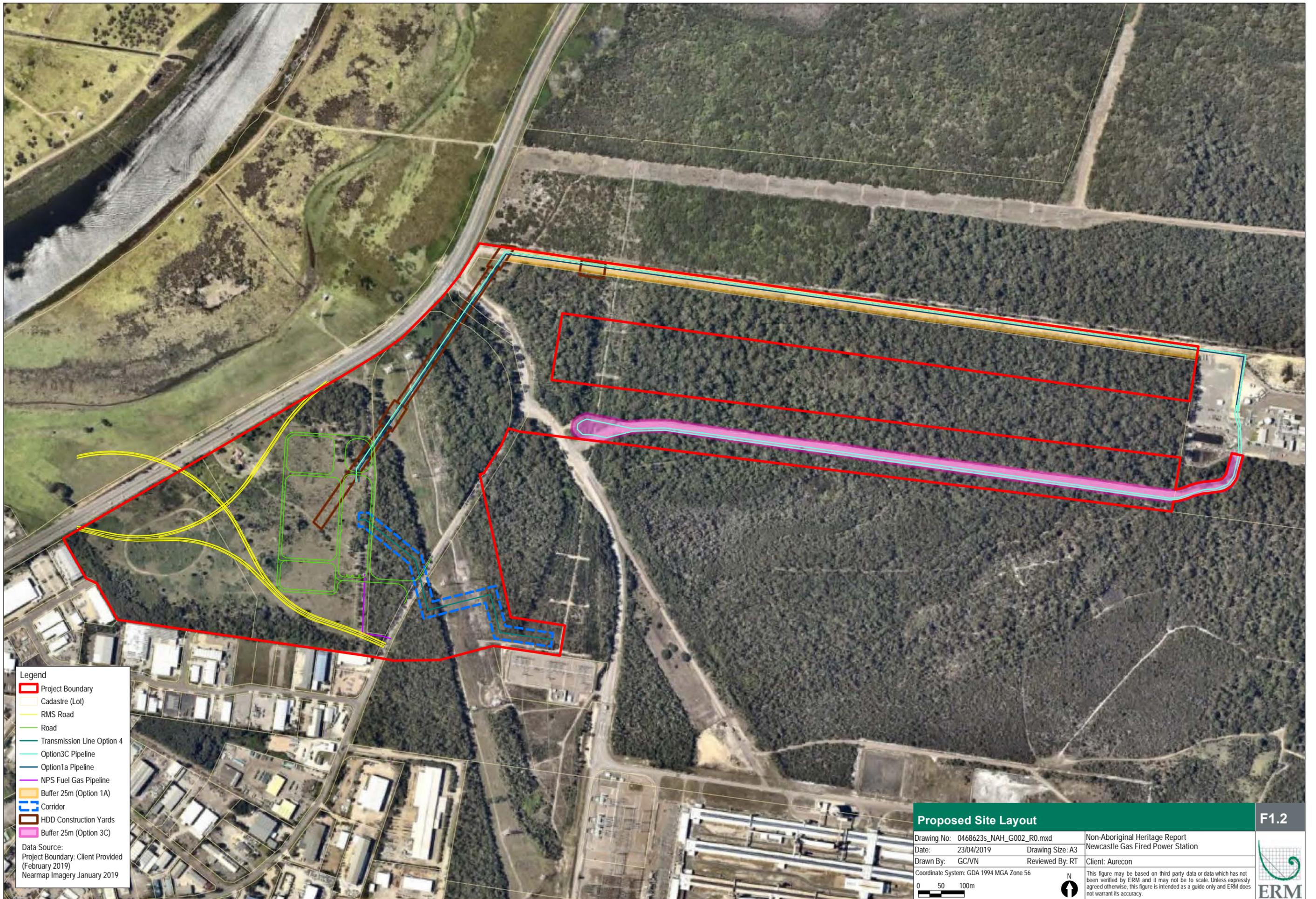
This report has been prepared by the following team:

- Katherine Deverson, ERM Heritage Consultant – primary author;
- Stephanie Moore, ERM Heritage Consultant – supporting author;
- Erin Finnegan, ERM Principal Heritage Consultant – technical review; and
- Paul Douglass, ERM Partner– quality assurance review.



Legend
 Project Boundary
 Cadastre (Lot)
 Data Source:
 Project Boundary: Client Provided
 (February 2019)
 Nearmap Imagery January 2019

Site Location		F1.1
Drawing No: 0468623s_NAH_G001_R0.mxd	Non-Aboriginal Heritage Report	
Date: 23/04/2019	Drawing Size: A3	Newcastle Gas Fired Power Station
Drawn By: GC/VN	Reviewed By: RT	Client: Aurecon
Coordinate System: GDA 1994 MGA Zone 56		
0 50 100m		<small>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</small>
		



Legend

- Project Boundary
- Cadastre (Lot)
- RMS Road
- Road
- Transmission Line Option 4
- Option3C Pipeline
- Option1a Pipeline
- NPS Fuel Gas Pipeline
- Buffer 25m (Option 1A)
- Corridor
- HDD Construction Yards
- Buffer 25m (Option 3C)

Data Source:
 Project Boundary: Client Provided (February 2019)
 Nearmap Imagery January 2019

Proposed Site Layout		F1.2
Drawing No: 0468623s_NAH_G002_R0.mxd	Date: 23/04/2019	Drawing Size: A3
Drawn By: GC/VN	Reviewed By: RT	Client: Aurecon
Coordinate System: GDA 1994 MGA Zone 56		Non-Aboriginal Heritage Report Newcastle Gas Fired Power Station
0 50 100m	N ↑	This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

2. LEGISLATION

The following section provides an overview of the relevant legislation and guidelines to which this non-Aboriginal heritage assessment has been prepared.

2.1 NSW Legislation

2.1.1 NSW Heritage Act 1977

The New South Wales (NSW) Heritage Act 1977 establishes the NSW Heritage Council and the State Heritage Register (SHR). The aim of the Act is to conserve the heritage of NSW. The aim of heritage management is not to prevent change and development, but to ensure that the heritage significance of recognised heritage items is not harmed by changes and developments.

The SHR is a separate listing to the State Heritage Inventory (SHI) and includes items which are accorded SHR listing through gazettal in the NSW Government Gazette. Nominated items are considered by the NSW Heritage Council, which then makes a recommendation to the Minister for Environment and Heritage. The Heritage Council is empowered to place Interim Heritage Orders (IHO) on an item of potential state significance. The assessment of significance is made against the criteria shown in *Table 2.1*.

Table 2.1 NSW State Heritage Significance Criteria

NSW Criterion
(a) Historical <i>An item is important in the course, or pattern, of NSW's cultural or natural history.</i>
(b) Association <i>An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history.</i>
(c) Aesthetic <i>An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW.</i>
(d) Social <i>An item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons.</i>
(e) Scientific <i>An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history.</i>
(f) Rarity <i>An item possesses uncommon, rare or endangered, aspects of NSW's cultural or natural history.</i>
(g) Representativeness <i>An item is important in demonstrating the principal characteristics of a class of NSW's a) cultural or natural places: or b) cultural or natural environments.</i>

2.1.1.1 State Heritage Inventory

The SHI contains over 25,000 heritage items on statutory lists in NSW.. This information is provided by local councils and State government agencies. The level of information for each heritage item can range from basic identification information such as name, address and listing to full information such as detailed descriptions, histories, significance and images. While the Heritage Division seeks to keep the Inventory up to date, the most recent statutory listings may not yet be included.

2.1.2 Environmental Planning And Assessment Act 1979 (NSW)

The *Environmental Planning and Assessment Act 1979* (EP&A Act) regulates a system of environmental planning and assessment for NSW. Land use planning requires that environmental impacts, including those on cultural heritage, must be considered when making decisions about the future of a place.

The EP&A Act allows for the preparation of planning instruments to direct development within NSW. This includes Local Environment Plans (LEP), which are administered by local government, and principally determine land-use and the process for development applications. LEPs usually include a schedule of identified heritage items.

The Project Area is within Port Stephens Council and is subject to the Port Stephens LEP 2013.

2.2 Non-Statutory Considerations

2.2.1 National Trust of NSW

The National Trust is a community-based, non-government organisation. The National Trust has a database of important heritage sites across the State.

2.2.2 The Burra Charter

The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance (Adopted 31 October 2013) (The Burra Charter) sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance including owners, managers and custodians. The Charter provides specific guidance for physical and procedural actions that should occur in relation to significant places. A copy of the 2013 charter can also be accessed at: <http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf>.

This non-Aboriginal heritage assessment report has been prepared in accordance with this document and to the standards it describes.

3. HISTORICAL CONTEXT

This chapter considers the potential non-Aboriginal heritage values for the Project Area. It includes a review of primary and secondary resources including available heritage assessments, reports, publications, historical maps and aerial imagery for the local area. This material will be used to help determine the Project Area's history and development over time. The following databases were also searched to determine whether known historic (non-Aboriginal) heritage sites are located within the Project Area:

- Australian Heritage Database, which includes:
 - Commonwealth Heritage List (CHL);
 - Register of the National Estate (RNE); and
 - National Heritage List (NHL);
- NSW SHR and SHI;
- Port Stephens LEP 2013; and
- The National Trust of Australia (NSW).

3.1 Historical Overview

3.1.1 *Aboriginal History of Tomago*

The Worimi people are the traditional owners of the Tomago area. Early historical records indicate the Worimi people extended south as far as Stockton, north to Cape Hawke and inland to Dungog and Maitland (Tindale 1974). The people who lived south of the Worimi were the Awabakal and to the north were the Birpai. Tindale (1974) maps the Newcastle area as being inhabited by the Awabakal people at the time of European occupation. The Awabakal people consisted of various clans that inhabited areas ranging from Lake Macquarie, west to the Sugarloaf Ranges, north around the Hexham Swamp and including the Central Coast (Gunson 1974). By studying accounts of early European settlers and drawing on the results of archaeological investigations, we can reconstruct aspects of the Worimi lifestyle. The subsistence and economy of Aboriginal groups depended largely on the environment in which they lived. While coastal groups exploited marine and estuarine resources, hinterland groups relied on freshwater and terrestrial animals and plants. Ethnographic observations of Aboriginal people in the Newcastle region suggest that a wide range of subsistence resources were available, including food resources such as fish, whales, porpoise, shellfish, kangaroos, bandicoots, snakes, lizards, birds; stone resources such as quartz and silcrete (AMBS 2005). Early European accounts of this are noted, such as a trip along the Hawkesbury-Nepean in 1791, where Watkin Tench recorded his observations of Worimi people and their daily practices (ERM 2005). Following the arrival of Europeans in the late 18th century, the Worimi people continued to live in the Tomago area up until at least the 1870s although their population and ability to live as before rapidly declined (Austral Archaeology 2011).

3.1.2 *Development of the Newcastle Area*

Nobbys Head was marked on a map by Captain Cook during an expedition sailing north on May 10 1770. It was subsequently discovered by Lieutenant Shortland in September 1797, who had been in search of escaped convicts in the area. While returning home after searching for the convicts in Port Stephens, he encountered a 'very fine coal river', which he named after Governor Hunter (SLNSW CY3008 154).

Shortland was the first European explorer of Newcastle and his original landing at Signal Hill on September 9, 1797, is considered the mark of the founding of the city. Shortland brought sketches of the area back to Sydney and over the next two years ships sailed to the Hunter for coal (Suters Architects 1997).

During the early 19th century, Governor King sent an expedition in the HMS Lady Nelson to survey the resources around the Hunter. A small post at the river mouth was also established during this time, though this settlement was short-lived due to mutiny. Another settlement was then established in 1804 as a penal colony. At this time the area was re-named Newcastle (Suters Architects 1997).

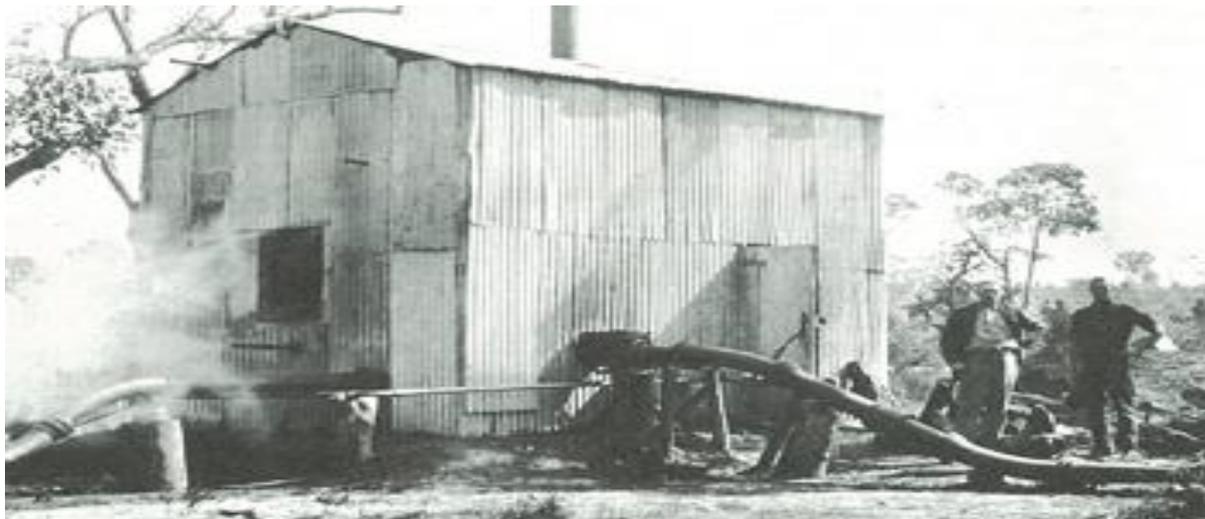
Newcastle remained a penal settlement for almost 20 years. In 1823, the penal colony ended and prisoners were sent to Port Macquarie. The settlement further developed with industries including coal mining, copper smelting, soap making and steelworks (Suters Architects 1997).

The Australian Agricultural Company (AA Co), established in London in 1824, initially took up a million acre land grant in NSW to raise merino sheep (Pemberton 1985). The AA Co also became involved in coal mining in the Newcastle region in 1826 with a 500 acres land grant in the area (RPS 2011). During the second half of the 19th century, the AA Co's coal mining activities at Newcastle gradually decreased, following the establishment of competitive coal mining rights in the Newcastle area.

3.1.3 *European History of the Tomago Area*

Early occupations for convicts in the Tomago area were oyster shell mining and lime burning, which was carried out along the Hunter River; coal mining, and subsistence farming also supported the penal settlement (Austral Archaeology 2011; Walsh 2010). Free settlement in the Tomago area began in the early 1820's and increased in the 1830s and 1840s and grazing and agricultural properties such as the well-known Tomago House were established at this time (Austral Archaeology 2011; National Trust n.d.; NSW Heritage Office 2008). A number of mineral leases were taken out in the 1880s. These mineral leases relate to exploitation of coal reserves associated with the Tomago Coal Measures, which was one of the four coal measures that comprise the Newcastle/Hunter Valley coalfields. Although commercial mining of the Tomago Measures ceased in the mid-1860s, exploratory work to locate further seams continued. Mining continued to be a major local industry through the 19th and 20th centuries.

The Tomago Sandbed Water Supply Scheme was established in 1939, following the investigation of the sandbeds (north of the Project Area) in 1915 and through the 1920s as a source of potable water for Newcastle (Hunter Water, n.d.). The system required the construction of a number of major pumping stations and a series of smaller bore pumping units (refer to Photograph 3.1). Pumping Station No. 7, now under the control of Hunter Water Corporation, continues in its original use today in Williamstown, approximately 6 km north-east of the Project Area (refer to Photograph 3.2).



Photograph 3.1 **The Hunter Water Pumping Station erected, c.1939 (Hunter Water, N.D)**



Photograph 3.2 Hunter Water Pumping Station (ERM 2017).

From the 1940s with the onset of World War II, Tomago developed as an industrial and manufacturing area (Austral Archaeology 2011). The Tomago Aluminium Smelter was established in the early 1980s at a site that had previously housed a coal mine, from the early 19th century, and later the Courtaulds Textile Factory, which operated until 1976 (NSW Heritage Office 2008). At the time that aluminium production began in 1983 it was the largest AP18 plant in the world; now expanded it remains the largest aluminium smelter in Australia (NSW Heritage Office 2008). The Tomago area is still primarily used for agricultural and industrial purposes today however it retains a small local population (Coffey 2011).

3.1.3.1 History of the Project Area

In 1829 the Project Area was part of a land grant of 1,920 acres to William Peppercorn, who named the property 'Kennington Park' (Willetts n.d.). William Peppercorn arrived in Australia as a free settler from London in 1828 (Willetts n.d.). He began planting wheat on his estate in the 1830s, however it is unclear if this planting occurred within the Project Area itself. In 1878, the Kennington Park estate was mentioned in the Newcastle Morning Herald (9 February 1878), the article stated that at this time a Mr William Bowden now owned the estate of "some 2000 acres of fine agricultural and grazing land".

The Project Area is located within Stockton Parish, and parish maps from 1915, 1923, 1933, and 1961 are available (refer to *Appendix A*). The maps show the development of the Project Area through the first half of the 20th century, with the construction of the transmission line and corridor between 1923 and 1933, and the resumption of land to construct the Pacific Motorway (M1) prior to 1961.

Historic aerial photographs sourced for the Project Area show that an early version of the M1 had in fact been constructed prior to 1954 (refer to *Figure 3.1*). The parish maps also show that the south-western section of the Project Area is part of a flood plain for the Hunter River (refer to *Figure FA.4*). Whether the entire Project Area was cleared during pastoral and agricultural activities in the mid-19th century is not shown in any available parish maps or other similar documentation (refer to *Appendix A*) and remains unclear, however the earliest available aerial photographs show that by at least the 1950s, areas of bushland had been allowed to regrow throughout the Project Area (refer to

Figures 3.1 to 3.3), it is possible that these areas were even left as remnant bush areas from before European settlement.

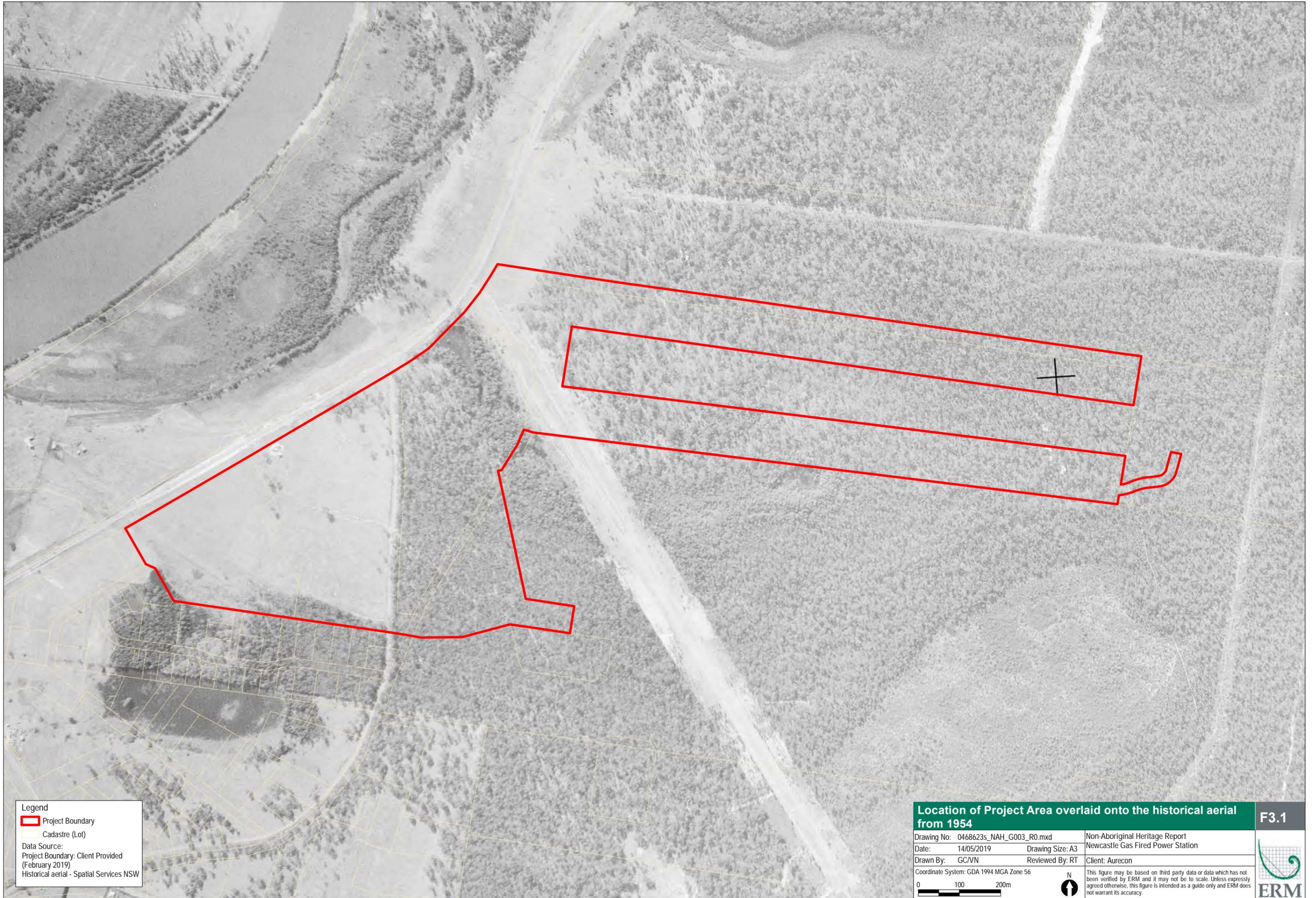
A house is located on the western boundary of the Project Area (refer to *Photograph 3.1*), from aerial photographs it appears to have been constructed prior to 1954 (refer to *Figures 3.1 to 3.3*). It faces onto the M1, and is thought to have been constructed sometime in the 1940s or early 1950s around the time the highway was constructed. The aerial photographs show development of sheds and other small buildings at the house site throughout the second half of the 20th century. The house and its yard are still extant today.



Photograph 3.3 House on western boundary of Project Area (ERM 2019).

3.1.3.2 *NGSF Cultural Heritage Assessment*

In 2011 AGL commissioned Coffey Natural Systems Pty Ltd (Coffey) to undertake an Environmental Assessment as part of the application process for the (then proposed) NGSF Project. The NGSF site, which is now operational, sits at the northern end of the Project Area. The Environmental Assessment included a Cultural Heritage Assessment (RPS 2011) that investigated potential impacts to both Aboriginal and historic heritage. These reports found, that while there were historic heritage sites within local proximity (refer to *Section 3.2*), none were located within the NGSF Project Area. The Cultural Heritage Assessment concluded that historic heritage sites of significance were unlikely to be found within the Project Area or impacted by the NGSF Project.



Legend

- Project Boundary
- Cadastre (Lot)

Data Source:
 Project Boundary: Client Provided (February 2019)
 Historical aerial - Spatial Services NSW

Location of Project Area overlaid onto the historical aerial from 1954		F3.1
Drawing No: 0468623s_NAH_G003_R0.mxd	Date: 14/05/2019	Drawing Size: A3
Drawn By: GC/VN	Reviewed By: RT	Client: Aurecon
Coordinate System: GDA 1994 MGA Zone 56		Non-Aboriginal Heritage Report Newcastle Gas Fired Power Station
0 100 200m	N ↑	This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
		ERM



Legend

- Project Boundary
- Cadastre (Lot)

Data Source:
 Project Boundary: Client Provided (February 2019)
 Historical aerial - Spatial Services NSW

Location of Project Area overlaid onto the historical aerial from 1976

Drawing No: 0468623s_NAH_G004_R0.mxd	Non-Aboriginal Heritage Report
Date: 14/05/2019	Newcastle Gas Fired Power Station
Drawn By: GC/VN	Reviewed By: RT
Client: Aurecon	

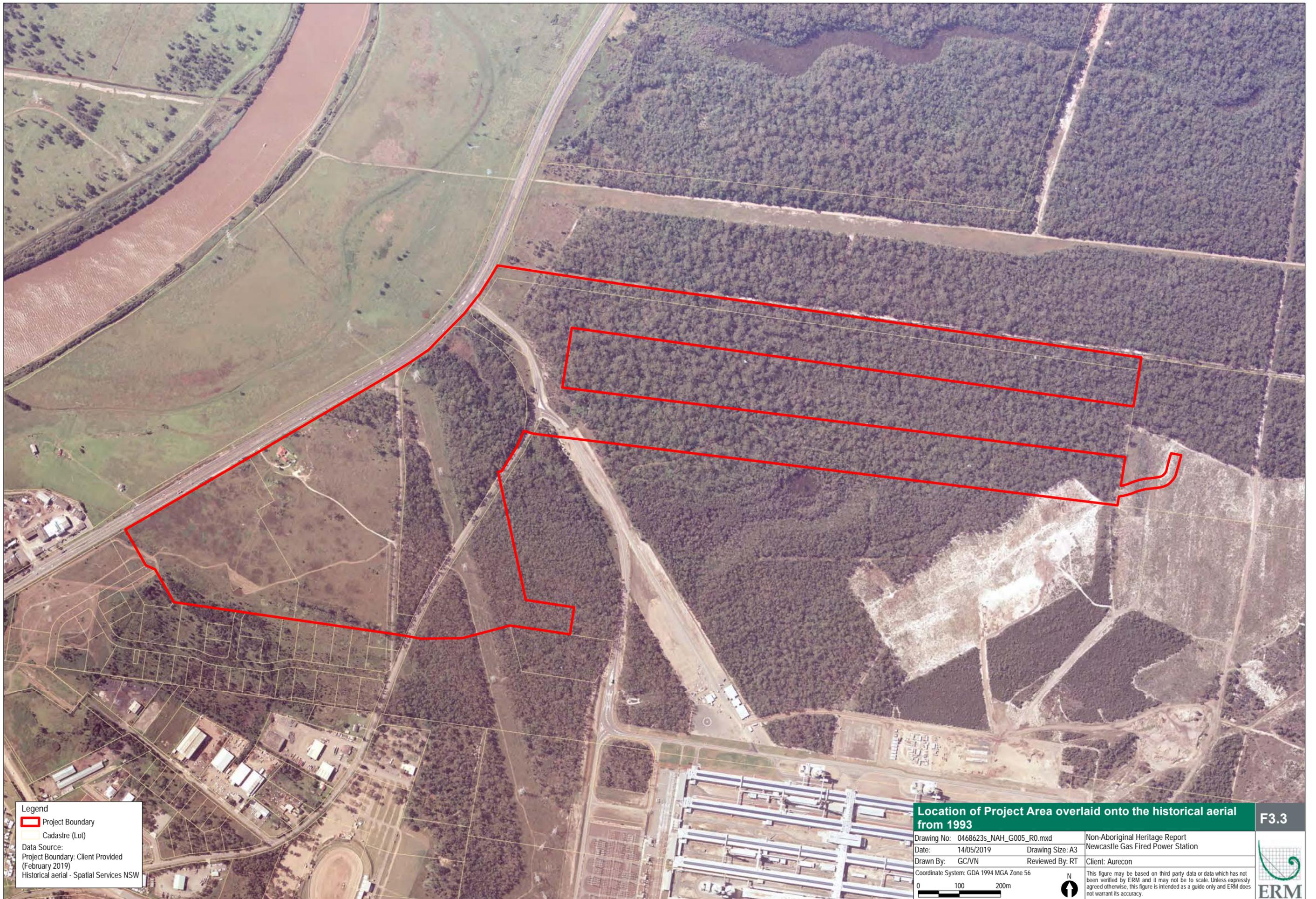
Coordinate System: GDA 1994 MGA Zone 56

0 100 200m

N

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

F3.2



Legend
 Project Boundary
 Cadastre (Lot)
 Data Source:
 Project Boundary: Client Provided
 (February 2019)
 Historical aerial - Spatial Services NSW

Location of Project Area overlaid onto the historical aerial from 1993

Drawing No: 0468623s_NAH_G005_R0.mxd	Non-Aboriginal Heritage Report
Date: 14/05/2019	Newcastle Gas Fired Power Station
Drawn By: GC/VN	Reviewed By: RT
Client: Aurecon	
Coordinate System: GDA 1994 MGA Zone 56	
0 100 200m	
	This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.



3.2 Historical Heritage Database Searches

A search of heritage databases was undertaken on 13 May 2019 to determine whether any historic (non-Aboriginal) heritage items have previously been recorded within the Project Area. The results are outlined in *Sections 3.2.1 to 3.2.3* below.

3.2.1 Australian Heritage Database

There are no places listed on the Commonwealth Heritage List, or National Heritage List, or within or near the Project Area. Two items in the local area are listed on the Register of the National Estate (non-statutory archive), however, both of which are located approximately 2.5 km SW of the Project Area, these are:

- Tomago House Chapel, Tomago Road, Tomago (Place ID 1325); and
- Tomago House, Grounds, Trees and Chapel, Tomago Road, Tomago (Place ID 1324).

3.2.2 State Heritage Inventory

A search of the State Heritage Inventory indicated that there are five place listed under the NSW Heritage Act (NSW State Heritage Register or s.170 NSW State Agency Heritage Register) near the Project Area: These are shown in *Table 3.2* below.

Table 3.1 State Listed Heritage Sites near Project Area

Site Name	LEP	Item # / Register	Location	Distance from Project Area
Tomago House and Tomago Chapel	Port Stephens	SHR #00207	421-3 Tomago Road	approximately 2.5 km SE
Hexham Bridge over Hunter River	Newcastle	s.170 register	Pacific Highway, Hexham	approximately 2 km SW
Tomago # 2 Spray Basin	Port Stephens	s.170 register	2034 Pacific Highway, Heatherbrae	approximately 1 km N
Tomago # 8 Vacuum Pumping Station	Port Stephens	s.170 register	2034 Pacific Highway, Heatherbrae	approximately 1 km N
Tomago Sands Scheme	Port Stephens	s.170 register	2034 Pacific Highway, Heatherbrae	approximately 1 km N

3.2.3 Local Environmental Plan

Three items that are close to the Project Area appear in the Schedule 5: Part 1 Heritage Items lists of the Port Stephens LEP (2013) and Newcastle LEP (2012). These are shown in *Table 3.2* below.

Further historic heritage items are located on the opposite side of the Hunter River to the west and south, include a railway station, hotel, factories and other industrial sites, a school, church, and other public buildings associated with early European settlement and industry. No listed historical heritage item will be impacted by the Project.

Table 3.2 LEP Listed Heritage Sites near Project Area

Site Name	LEP	Item #	Location	Distance from Project Area
Tomago House", including pinetum, pleasure garden and landscape setting	Port Stephens	I103	421 Tomago Road	approximately 2.5 km SE
Tomago House Chapel	Port Stephens	I104	423 Tomago Road	approximately 2.5 km SE
Hexham Bridge	Newcastle	I187	Pacific Highway, Hexham	approximately 2 km SW

3.3 Historical Heritage Predictive Model

There are no registered or known significant historic (non-Aboriginal) heritage sites in or near the Project Area. There may be evidence of early agricultural activities, timber harvesting, fence lines, tracks, evidence of rudimentary outbuildings, such as sheds in the Project Area. However, the historical background suggests that the Project Area was primarily used as grazing land. Given the long term pastoral grazing and ongoing site disturbance associated with the installation of and maintenance of the transmission lines through sections of the Project Area, it is unlikely that there will be substantial historical remains.

4. PHYSICAL ANALYSIS

This chapter provides an overview of the field surveys of the Project Area that were undertaken between 6 and 8 May 2019.

4.1 Field Survey Methodology

The non-Aboriginal heritage field survey was conducted in conjunction with the Aboriginal heritage survey and was carried out according to the survey methodology developed and sent to Representatives Aboriginal Parties (RAPs) on 4 April 2019. The survey was undertaken on foot where possible with all participants traversing in transects up to 5 m apart where vegetation growth permitted.. ERM Heritage consultant and archaeologist Katherine Deverson, ERM Consultant Phoebe Worth, and four RAPs, attended the field surveys. The results of the Aboriginal surveys are detailed in a separate Aboriginal Cultural Heritage Survey Report (ERM 2019). The archaeological survey aimed to assess the ground surface of the Project Area and targeted areas of soil exposures, ground visibility, and zones with low vegetation such as areas of erosion and any tracks or paths. All landform types and possible historical features and objects were also targeted.

During a survey ground visibility is essential to identify most historical features and objects. Visibility refers to the amount of ground upon which artefacts could be seen. The presence of vegetation, leaf litter and other variables can obscure visibility, which is expressed as a percentage. An exposure is defined as an area in which ground surface disturbance (usually in the form of erosion) results in the removal of ground cover and soils and permits the detection of archaeological material that was formerly contained within a surface or subsurface context. The level of exposure is determined as a percentage. As a descriptive tool, *Table 4.1* has been devised which indicates the level of ground surface visibility. It is a subjective method of assessment, but provides a useful tool when attempting to describe the level of ground surface visible during field surveys or inspection.

Table 4.1 Ground Surface Visibility Rating

	Description	GSV Rating %
Very Poor	Heavy vegetation, scrub foliage or debris cover, dense tree or scrub cover. Soil surface of the ground very difficult to see.	0-9%
Poor	Moderate level of vegetation, scrub, and / or tree cover. Some small patches of soil surface visible in the form of animal tracks, erosion, scalds, blowouts etc., in isolated patches. Soil surface visible in random patches.	10-29%
Fair	Moderate levels of vegetation, scrub and / or tree cover. Moderate sized patches of soil surface visible, possibly associated with animal, stock tracks, unsealed walking tracks, erosion, blow outs, etc. Soil surface visible as moderate to small patches across a larger section of the Project Area.	30-49%
Good	Moderate to low level of vegetation, tree or scrub cover. Greater amount of areas of soil surface visible in the form of erosion, scalds, blowouts, recent ploughing, grading or clearing.	50-59%
Very Good	Low levels of vegetation / scrub cover. Higher incidence of soil surface visible due to recent or past land-use practices such as ploughing, grading, mining, etc.	60-79%
Excellent	Very low to non-existent levels of vegetation/scrub cover. High incidence of soil surface visible due to past or recent land use practices, such as ploughing, grading, mining, etc.	80-100%

The field survey team surveyed each of the different landforms identified in the Project Area, which included gentle slopes and flats (refer to *Table 4.3*). Mature trees, erosion scours, and vehicle and animal access tracks were all inspected where accessible. In order to ensure the highest likelihood of finding non-Aboriginal sites, the field survey focussed on areas of highest ground visibility although it is noted that the ground surface visibility was very poor (0-9%) across the vast majority of the survey area. The Project Area generally consisted of two vegetation coverage types, remnant bushland and previously cleared areas covered in mostly grass and weed species. The previously cleared areas had not been recently slashed and were dominated by plant species such as blackberry and lantana; ground visibility was usually 0% except on some tracks and small isolated clearings. Due to the weed species, much of these areas were completely inaccessible. The remnant bushlands were generally densely vegetated areas with mature trees and dense ground covering plants and weeds, these areas were also mostly completely inaccessible.

4.2 Field Survey Results

The Project Area was surveyed over three days in May 2019 by Katherine Deverson, Phoebe Worth, and representatives of the RAPs as outlined in *Table 4.2*. The field survey methodology was adopted to pursue the discovery of new archaeological sites, ensure the accurate recording of such sites and provide sufficient information to provide an assessment of the Project Area's historic (non-Aboriginal) heritage significance.

Table 4.2 Field Survey Attendees

Name	Organisation
Katherine Deverson	ERM
Phoebe Worth	ERM
Caitlyn Moran	Nur-Run-Gee Pty Ltd
Bec Young	Mur-Roo-Ma Inc.
Luke Knight	Worimi Traditional Owners Indigenous Corporation
Brendan Lilley	Worimi Local Aboriginal Land Council

4.2.1 Description of the Project Area

The Project Area generally consisted of grazing paddocks with dense grass and weeds traversing lower and mid slope, and flat landforms (refer to *Table 4.3* and *Photographs 4.1* and *4.2*). There was generally a very poor level of ground surface visibility with some ground exposures along tracks. Disturbances observed include the development of fencing, tracks and roads, transmission infrastructure, and vegetation clearance. Several bush areas were also located in the Project Area (refer to *Photograph 4.3*). Exposures associated with tracks and other disturbances were examined for artefacts and features.

Soils across the Project Area range from alluvial soils adjacent to watercourses with thin sandy-silty Aeolian soil grey/brown in colour, to a white sand, particular to the north. Disturbance to the soil profile has occurred during past episodes of vegetation clearance.

Table 4.3 Landform Summary

Landform	% of landform effectively surveyed	Number of Sites
Mid slope	0.01%	0
Lower slope	0.015%	0
Flat	1.7%	0



Photograph 4.1 Western section of Project Area, view to NW (ERM 2019)



Photograph 4.2 Central transmission line, view to north (ERM 2019)



Photograph 4.3 Remnant or mature regrowth bush area in SU3, view to west from Old Punt Road (ERM 2019)

4.2.2 Survey Coverage

The Project Area was examined in six survey units, based on fenced areas and accessibility for ease of recording and analysis. These survey units are identified as Survey Unit (SU) 1 to SU6. The location of these survey units is shown in *Figure 4.1* and detailed in *Table 4.4*. The Project Area had not been slashed recently and was covered in dense grass and weed vegetation and as a result ground visibility was very low. The effective coverage shown in *Table 4.4* indicates the percentage of ground surface that the survey team was able to view.

Table 4.4 Survey Coverage

Survey Unit	Landform	Visibility %	Exposure %	Effective Coverage %	Number of Sites
SU1	Mid slope	Very Poor 0-5%	1%	0.01%	0
SU2	Mid slope	Very Poor 0-5%	1%	0.01%	0
SU3	Lower slope	Very Poor 0-5%	1%	0.01%	0
SU4	Lower slope	Very Poor 0-5%	2%	0.02%	0
SU5	Flat/Lower Slope	Poor 12%	10%	1.2%	0
SU6	Flat/Lower Slope	Poor 15%	15%	2%	0



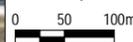
Legend

- Project Boundary
- Cadastre (Lot)

Survey Units

- SU1
- SU2
- SU3
- SU4
- SU5
- SU6

Data Source:
 Project Boundary: Client Provided (February 2019)
 Nearmap Imagery January 2019

Survey Units		F4.1
Drawing No: 0468623s_NAH_G006_R0.mxd	Non-Aboriginal Heritage Report	
Date: 14/05/2019	Drawing Size: A3	
Drawn By: VN	Reviewed By: RT	
Client: Aurecon		
Coordinate System: GDA 1994 MGA Zone 56		<small>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</small>
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>0 50 100m</p>  </div> <div style="text-align: center;"> <p>N</p>  </div> </div>		

4.2.3 Survey Results

4.2.3.1 Survey Unit 1

Survey Unit 1 (SU1) is bordered by mature bush areas along its eastern and southern borders. The majority of SU1 has previously been cleared but has not been recently slashed (refer to *Photograph 4.4*). The vast majority of SU1 has 0% ground visibility and is covered by grass and weed species, such as lantana and blackberry (refer to *Photograph 4.5*). An old unused road (the original Pacific Highway, refer to *Figures FA.1* and *FA.2*) runs from north to south just west of the eastern bush area and tracks run from this to a large circular track in the western portion of SU1. The tracks also generally had little or no ground visibility, but were generally free of vegetation except for grass plants, some small sections of track were clear of vegetation (refer to *Photographs 4.6* and *4.7*). A track leads from the circular track to the house which falls within the Project Area. The house is currently occupied and was not surveyed in May 2019. When visible the soil appears to be a brown/grey sandy soil.

No historic (non-Aboriginal) heritage features or items were identified in SU1.



Photograph 4.4 SU1, view to SE
(ERM 2019)



Photograph 4.5 Vegetation in SU1
(ERM 2019)



Photograph 4.6 Ground visibility on
tracks, SU1 (ERM 2019)



Photograph 4.7 Section of track
clear of vegetation, SU1 (ERM 2019)

4.2.3.2 Survey Unit 2

Survey Unit 2 (SU2) is bordered by mature bush areas along its eastern border (refer to *Photograph 4.8*). The majority of SU2 has previously been cleared but has not been recently slashed (refer to *Photograph 4.9*). The vast majority of SU2 has 0% ground visibility and is covered by grass and weed species, such as lantana and blackberry (refer to *Photograph 4.10*). An old unused sealed road (the original Pacific Highway, refer to *Figures FA.1* and *FA.2*) runs from north to south just west of the south-eastern bush area and a track run from this to the house which falls within the Project Area to the west (refer to *Photograph 4.11*). The house is currently occupied and was not surveyed in May 2019. Another old unused road, that runs from the north to the SE, sits to the west of the eastern bush area (refer to *Photograph 4.8*). The tracks also have little or no ground visibility, but are generally free of vegetation except for grass plants. When visible the soil appears to be a brown/grey sandy soil.

No historic (non-Aboriginal) heritage features or items were identified in SU2.



Photograph 4.8 Bush area and sealed road in SU2 (ERM 2019)



Photograph 4.9 SU2, view to west (ERM 2019)



Photograph 4.10 Vegetation in SU2 (ERM 2019)



Photograph 4.11 Ground visibility on tracks, SU2 (ERM 2019)

4.2.3.3 Survey Unit 3

Survey Unit 3 (SU3) consists of a large remnant or mature regrowth bush area in the north and a transmission corridor running from north to SSW in the southern section of the survey unit (refer to *Photograph 4.12*). The transmission corridor has not been recently slashed, and grass and weed species, such as lantana and blackberry as well as prickly pear, dominate (refer to *Photograph 4.13*). SU3 has almost 0% ground visibility. Four large transmission towers are located in this area, as well as drainage areas and notable areas of fill material (refer to *Photograph 4.14*). An old maintenance gravel track runs along and is associated with the transmission line (refer to *Photograph 4.15*). The northern bush area is inaccessible due to dense vegetation, and has 0% ground visibility (refer to *Photograph 4.3*). When visible the soil appears to be a brown/grey sandy soil.

No historic (non-Aboriginal) heritage features or items were identified in SU3.



Photograph 4.12 Transmission corridor, SU3 (ERM 2019)



Photograph 4.13 Vegetation and ground visibility, SU3 (ERM 2019)



Photograph 4.14 Drainage line, SU3, view to west (ERM 2019)



Photograph 4.15 Transmission line maintenance track, SU3, view to east (ERM 2019)

4.2.3.4 Survey Unit 4

Survey Unit 4 (SU4) consists of two areas of remnant or mature regrowth bush area in the north and south and a transmission corridor running from north to SSW in the central section of the survey unit (refer to *Photograph 4.16*). The transmission corridor has not been slashed for some time, and grass and weed species, such as lantana and blackberry and other weeds, dominate. SU4 has almost 0% ground visibility. Two large transmission towers are located in this area, as well as drainage areas and areas of fill material. Ecological replenishment activities have taken place in the form of nesting boxes and plantings have been undertaken in the south-eastern corner of the survey unit (refer to *Photographs 4.17* and *4.18*). A substation is located to the SE of SU4 outside the Project Area (refer to *Photograph 4.19*). An old unused track runs along the transmission line. The northern and southern bush areas are inaccessible due to dense vegetation, and have 0% ground visibility. When visible the soil appears to be a brown/grey sandy soil.

No historic (non-Aboriginal) heritage features or items were identified in SU4.



Photograph 4.16 SU4, view to east from SU3 (ERM 2019)



Photograph 4.17 Vegetation planting, SU4 (ERM 2019)



Photograph 4.18 SU4, northern bush area and nesting boxes (ERM 2019)



Photograph 4.19 SE corner of SU4 (ERM 2019)

4.2.3.5 Survey Unit 5

Survey Unit 5 (SU5) consists of a new sealed road, running east to west from the gas station entrance to the gas station, grassed road shoulders, and areas of remnant or mature regrowth bush area running to the north and south of the road (refer to *Photograph 4.20*). The road shoulder areas are largely covered in fill material and grass, however some areas of ground visibility show sand and brown/grey sandy soils (refer to *Photograph 4.21*). The northern and southern bush areas are inaccessible due to dense vegetation, and have 0% ground visibility.

No historic (non-Aboriginal) heritage features or items were identified in SU5.



Photograph 4.20 SU6, view to west
(ERM 2019)



Photograph 4.21 Sand at eastern end
of SU5, view to east (ERM 2019)

4.2.3.6 Survey Unit 6

Survey Unit 6 (SU6) consists of an old sealed road, running east to west, grasses road shoulders, and an area of remnant or mature regrowth bush area running to the south of the road (refer to *Photograph 4.22*). From the historic aerial photographs the older sealed road in this survey unit was constructed after 1993, and was likely the original road leading to the NGSF, a new road is now used to the south in SU5. The road shoulder areas are largely covered in fill material, however areas of ground visibility show sand and brown/grey sandy soils (refer to *Photograph 4.23*). The southern bush area is inaccessible due to dense vegetation, and has 0% ground visibility (refer to *Photograph 4.24*). Several fire trails run through the dense bush area between SU5 and SU6, the tracks are generally overgrown and not maintained (refer to *Photograph 4.25*).

No historic (non-Aboriginal) heritage features or items were identified in SU6.



Photograph 4.22 SU6, view to west from eastern end (ERM 2019)



Photograph 4.23 SU6, view to east from western end (ERM 2019)



Photograph 4.24 View to south along transmission corridor at western end of SU6 (ERM 2019)



Photograph 4.25 Tomago Fire Trail 4, view to north (ERM 2019)

5. ASSESSMENT OF HERITAGE SIGNIFICANCE AND IMPACT ASSESSMENT

5.1 Assessment of Heritage Significance

No historic (non-Aboriginal) heritage items were identified and no evidence for structures or subsurface expressions were identified during the survey. The desktop review did not identify any known historic heritage elements at the Project Area and, given its historic land use, it is considered unlikely that the Project Area contains historic heritage values that reach the threshold for local or State historic heritage significance. The historical archaeological potential of the Project Area is very low.

5.2 Impact Assessment

5.2.1 Description of Proposed Activities

AGL proposes to construct and operate a dual-fuel (gas/diesel) power station and associated infrastructure. The Project involves the construction and operation of approximately 250-megawatt (MW) dual-fuel power station and associated infrastructure including gas supply and electricity transmission connections. Impact Assessment

Considering the primary historical land-use of the Project Area was grazing, no previous historic heritage sites have been identified, and no historic heritage items or sites were identified during the site survey in May 2019, it is very unlikely that the Project will have any impact on non-Aboriginal heritage (built or archaeological).

6. CONCLUSIONS AND RECOMMENDATIONS

No historic (non-Aboriginal) heritage items or values were identified within the Project Area during the site survey and given the desktop review it is considered unlikely that historic heritage sites or items will be impacted by the Project. In the unlikely event that historic heritage items are located an unexpected find protocol is detailed below.

6.1 Unexpected Historic Heritage Finds Procedure

If any heritage objects and/or relics, such as glass, ceramic, metal, building footings and material etc., as protected under NSW legislation, are uncovered during the Project, then the following steps should be followed:

- all activity in the immediate area should cease immediately, and:
 - the project manager should be notified;
 - flagging/fencing erected to demarcate and protect the area; and
 - all site personnel and visitors advised to avoid the area until further notice;
- an appropriately qualified heritage professional should be consulted to confirm if the object/s is a heritage item or relic;
- OEHL should be immediately contacted; and
- an appropriately qualified heritage professional should record the location and attributes of the site and determine the significance of the find.

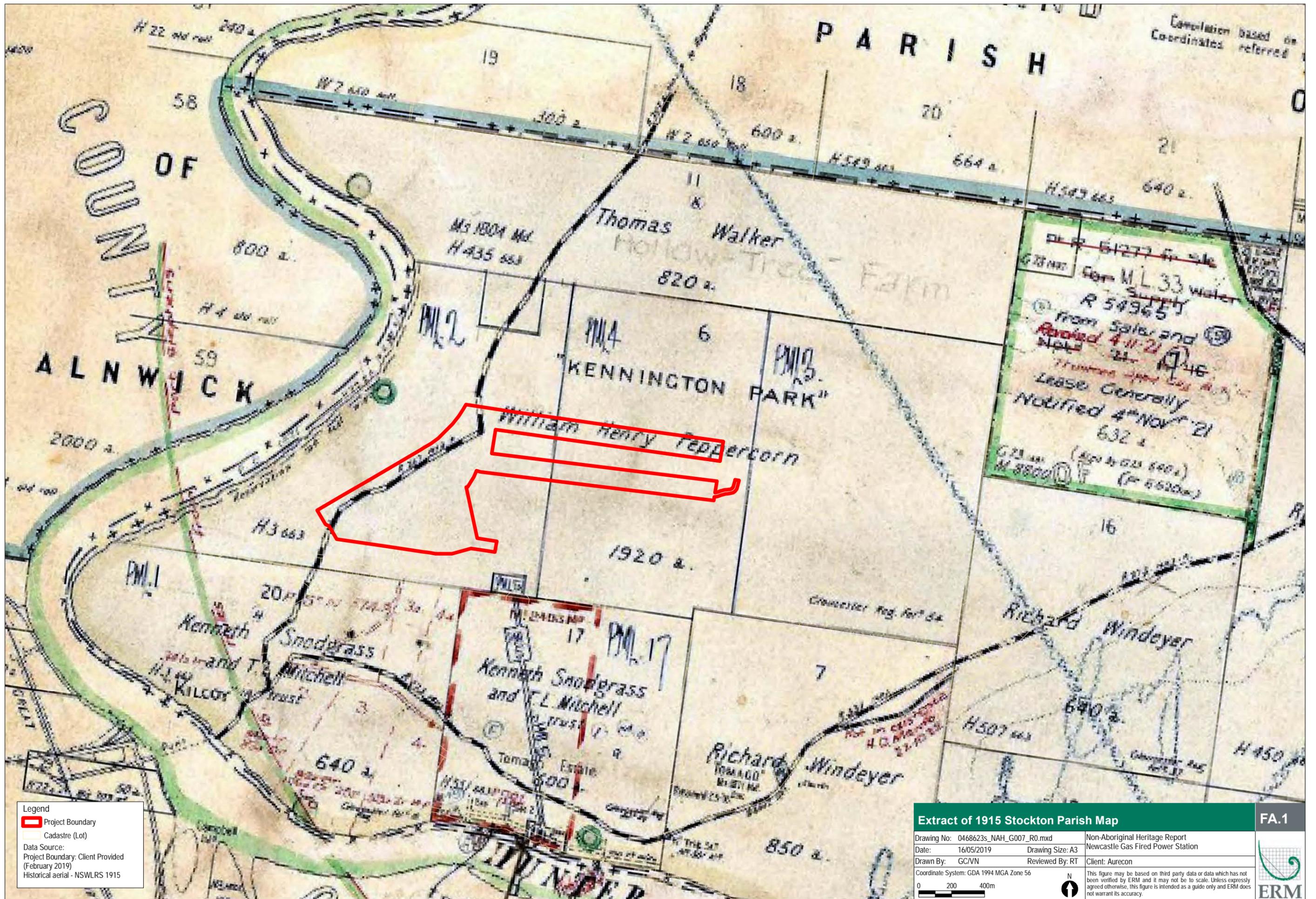
In the event of the discovery of human skeletal material (or suspected human skeletal material) during project activities in the Project Area the following steps should be followed:

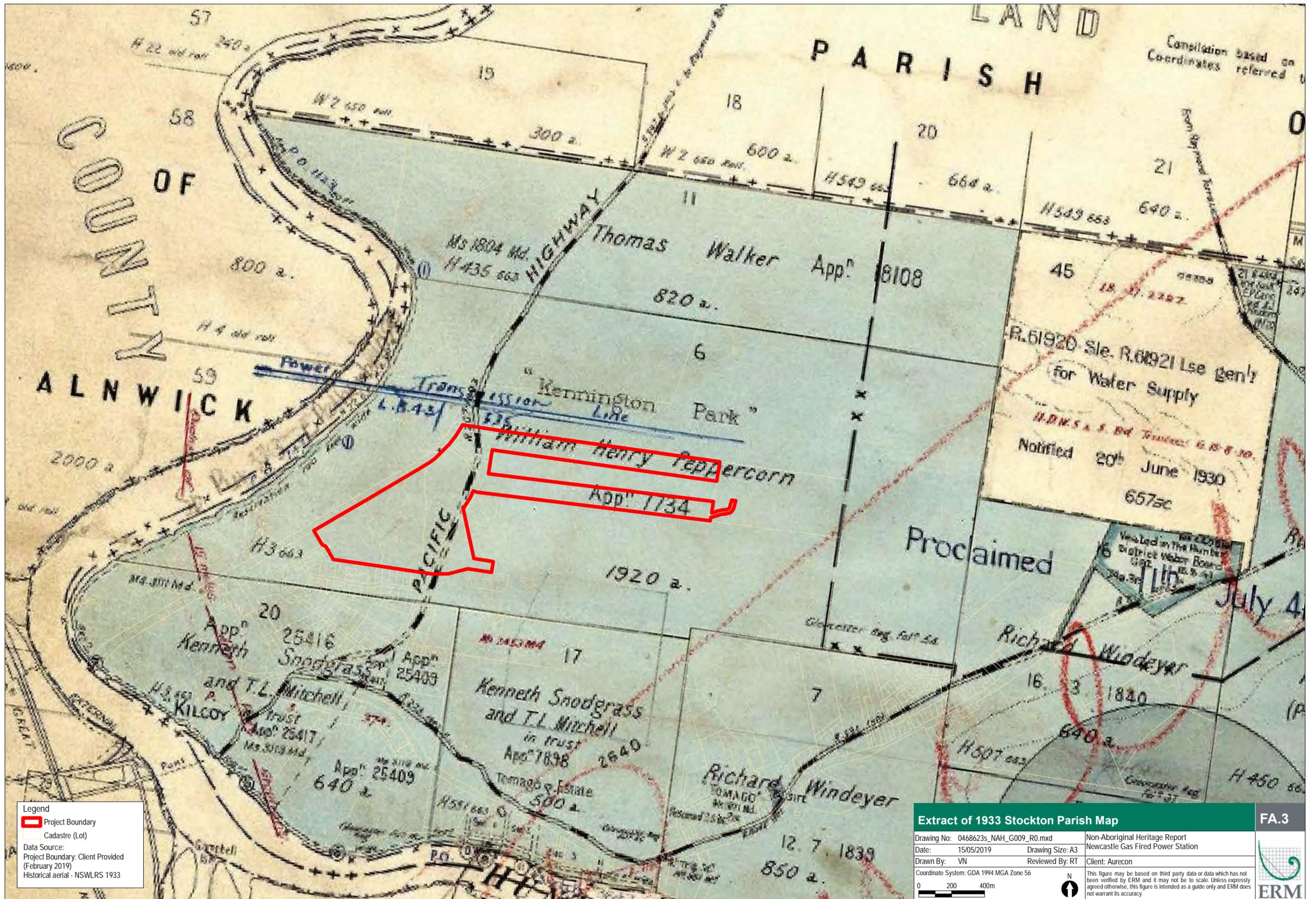
- all activities and/or works in the immediate area must cease;
- the NSW Police must be immediately contacted along with the Project Manager and OEHL;
- flagging/fencing erected to demarcate and protect the area;
- all site personnel and visitors advised to avoid the area until further notice; and
- any sand/soils removed from the near vicinity of the find must be identified and set aside for assessment by the investigating authorities.

REFERENCES

- AMBS (2005) **Aboriginal Heritage Study: Newcastle Local Government Area**. Newcastle City Council.
- Austral Archaeology. 2011. **Northbank Enterprise Hub, Tomago, Historical Archaeological Desktop Assessment and Sensitivity Mapping**. A report for EJE Heritage.
- Australia ICOMOS, **Burra Charter – The Australia ICOMOS Charter for Places of Cultural Significance 2013**
- Coffey Natural Systems Pty Ltd (Coffey). 2011. **Environmental Assessment Newcastle Gas Storage Facility Project; Major Project Application Number 10-0133**. A report for AGL.
- Environmental Resources Management Australia Pty Ltd (ERM) 2005 **Fern Bay Estate Master plan Study Aboriginal Heritage Assessment Report**. Report to Winton (20) Pty Ltd and Continental Venture Capital Limited.
- ERM 2019 **Newcastle Power Station Aboriginal Archaeological Survey Report** (draft). An unpublished report for Aurecon on behalf of AGL.
- Gunson, N. (ed) (1974) **Australian Reminiscences and Papers of L. E. Threlkeld. Missionary to the Aborigines 1824 to 1859**. Institute of Aboriginal Studies. Canberra.
- Hunter Water (n.d) **Tomago Sandbeds Provide Drinking Water**. Retrieved from <https://www.hunterwater.com.au/About-Us/Our-Organisation/Our-History--Heritage/Timeline-Items/Tomago-Sandbeds-Provide-Drinking-Water.aspx>
- National Trust, n.d. **Tomago House**. Retrieved from <https://www.nationaltrust.org.au/places/tomago-house/>
- NSW Department of Planning, Heritage Branch. 2009. **Assessing Significance for Historical Archaeological Sites and 'Relics'**
- NSW Heritage Office. 2001. **Assessing Heritage Significance**
- NSW Heritage Office. 2002. **Statements of Heritage Impact**
- NSW Heritage Office. 2008. **State Heritage Register. Tomago House & Tomago Chapel**. Retrieved from <https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045718>
- Pemberton, P. (1985) **Australian Agricultural Company Peel River Land & Mineral Company**. Obtained online from the Australian National University Archives (<http://archives.anu.edu.au/>).
- RPS. 2011. **Cultural Heritage Assessment Newcastle Gas Storage Facility Project**. A report for Coffey on behalf of AGL.
- Shortland, J. (1798) **Extract of a Letter from Lieut. John Shortland of H.M.S. Reliance, to his Father...', 10 September 1798** (SLNSW CY3008 154)
- Suters Architects (1997) **Newcastle City Wide Heritage Study**. Report to Newcastle City Council.
- Tindale, N.B. 1974. **Aboriginal Tribes of Australia**. University of California Press: Berkeley.
- Walsh, B. 2010. **Was Newcastle the Colony's first place of secondary punishment?** Hunter Living Histories. Retrieved from <https://hunterlivinghistories.com/2010/11/11/was-newcastle-the-colonys-first-place-of-secondary-punishment/>
- Willetts, J. n.d. **Hunter Valley Settler, William Peppercorn**. Retrieved from https://www.jenwilletts.com/william_peppercorn.htm

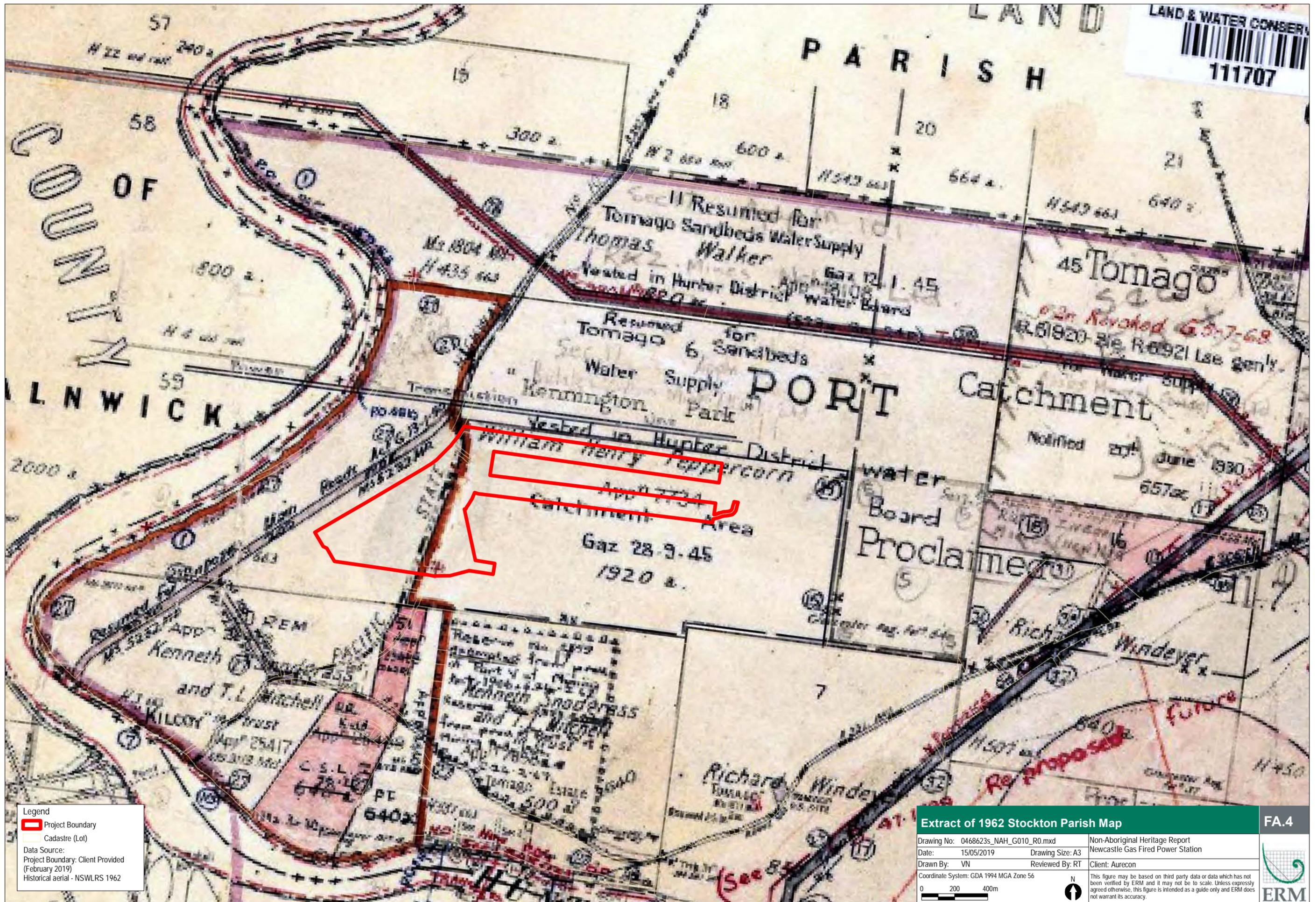
APPENDIX A STOCKTON PARISH MAPS





Legend
 [Red Outline] Project Boundary
 [Yellow Outline] Cadastral (Lot)
 Data Source:
 Project Boundary: Client Provided
 (February 2019)
 Historical aerial - NSWLRS 1933

Extract of 1933 Stockton Parish Map		FA.3
Drawing No: 0468623s_NAH_G009_R0.mxd	Non-Aboriginal Heritage Report	
Date: 15/05/2019	Drawing Size: A3	Newcastle Gas Fired Power Station
Drawn By: VN	Reviewed By: RT	Client: Aurecon
Coordinate System: GDA 1994 MGA Zone 56		This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
0 200 400m 		



Legend

- ▭ Project Boundary
- Cadastral (Lot)

Data Source:
 Project Boundary: Client Provided (February 2019)
 Historical aerial - NSWLRS 1962

Extract of 1962 Stockton Parish Map		FA.4
Drawing No: 0468623s_NAH_G010_R0.mxd	Non-Aboriginal Heritage Report	
Date: 15/05/2019	Drawing Size: A3	Newcastle Gas Fired Power Station
Drawn By: VN	Reviewed By: RT	Client: Aurecon
Coordinate System: GDA 1994 MGA Zone 56		<small>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</small>

APPENDIX B SEARS

Planning Secretary's Environmental Assessment Requirements

Section 5.16 of the *Environmental Planning and Assessment Act 1979*

Application Number	SSI 9837
Project	The Newcastle Gas Fired Power Station Project which includes: <ul style="list-style-type: none"> • the construction and operation of a gas fired power station; and • ancillary infrastructure including connection to gas supply, gas compression facilities, fuel storage tanks, water management facilities and grid connection.
Location	Tomago, north of Newcastle, in the Port Stephens local government area.
Proponent	AGL Energy Limited
Date of Issue	18 February 2019
General Requirements	<p>The Environmental Impact Statement (EIS) must comply with the requirements in Schedule 2 of the <i>Environmental Planning and Assessment Regulation 2000</i> (EP&A Regulation).</p> <p>In particular, the EIS must include, but not necessarily be limited to, the following:</p> <ul style="list-style-type: none"> • a stand-alone executive summary; • a full description of the project, including: <ul style="list-style-type: none"> - all components, materials and activities required to construct the project (including any infrastructure that would be required for the project, but the subject of a separate approvals process); - site plans and maps at an adequate scale showing: <ul style="list-style-type: none"> - the location and dimensions of all project components; and - existing infrastructure, land use, and environmental features in the vicinity of the project (including any other existing, approved or proposed infrastructure in the region); - likely staging or sequencing of the project, including construction and rehabilitation; - the likely interactions between the project and any other existing, approved or proposed major projects in the vicinity of the site (including the Newcastle Gas Storage Facility, Tomago Aluminium Smelter, and M1 to Raymond Terrace Motorway Project); • a justification for the proposed project as opposed to other alternatives; • statutory context for the project, including: <ul style="list-style-type: none"> - how the project meets the provisions and objectives of the <i>Environmental Planning and Assessment Act 1979</i> (EP&A Act) and EP&A Regulation; - consideration of the project against all relevant environmental planning instruments; - any approvals that must be obtained before the project can commence; and • an assessment of the likely impacts of the project on the environment, focusing on the specific issues identified below, including:

	<ul style="list-style-type: none"> - a description of the existing environment likely to be affected by the project using sufficient baseline data; - a description of how the project has been designed to avoid and minimise impacts (including selection of gas connection option); and - an assessment of the potential impacts of the project, including any cumulative impacts, and taking into consideration relevant guidelines, policies, plans and industry codes of practice; <ul style="list-style-type: none"> • a consolidated summary of all the proposed environmental management and monitoring measures, identifying all the commitments in the EIS; and • an evaluation of the project as a whole having regard to: <ul style="list-style-type: none"> - relevant matters for consideration under the EP&A Act including ecologically sustainable development; - the strategic need and justification for the project having regard to energy security and reliability in NSW and the broader National Electricity Market; and - the biophysical, economic and social costs and benefits of the project. <p>While not exhaustive, Attachment 1 contains a list of some of the environmental planning instruments, guidelines, policies, and plans that may be relevant to the environmental assessment of the project.</p>
<p>Key issues</p>	<p>The level of assessment of likely impacts should be commensurate with the significance or degree or extent of impact within the context of the proposed location and surrounding environment, and having regard to applicable NSW Government policies and guidelines.</p> <p>In particular, the EIS must address the following matters:</p> <ul style="list-style-type: none"> • Biodiversity – including: <ul style="list-style-type: none"> - an assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with the NSW <i>Biodiversity Conservation Act 2016</i>, the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR); and - the BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM; • Heritage – including: <ul style="list-style-type: none"> - an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the project, including adequate consultation with Aboriginal stakeholders having regard to the <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents</i> (OEH, 2010); • Hazards and Risks – including: <ul style="list-style-type: none"> - a Preliminary Hazard Analysis (PHA), covering all aspects of the project which may impose public risks, to be prepared consistent with <i>Hazardous Industry Planning Advisory Paper No. 6 – Guidelines of Hazard Analysis</i> (DPE, 2011) and <i>Multi-level Risk Assessment</i>. The PHA must: <ul style="list-style-type: none"> ▪ include a pipeline risk assessment to estimate the risks from the pipeline to the surrounding land uses, with reference to Australian Standards <i>AS2885 Pipelines – Gas and Liquid Petroleum, Operation and Maintenance</i>; ▪ Demonstrate that the risks from the project comply with the criteria set out in <i>Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning</i> (DPE, 2011); and

	<ul style="list-style-type: none"> - a plume rise impact assessment prepared in accordance with CASA's guidelines for conducting plume rise assessments; • Land and Contamination – including: <ul style="list-style-type: none"> - an assessment of impacts of the project on soils, land capability and geotechnical stability of the site and surrounds; - an assessment of the extent and nature of any contaminated materials or acid sulphate soils on site or in dredged material; - an assessment of potential risks to human health and the receiving environment; and - a description of the measures that would be implemented to avoid or mitigate impacts; • Water – including: <ul style="list-style-type: none"> - an assessment of the impacts of the project on groundwater aquifers and groundwater dependent ecosystems having regard to the <i>NSW Aquifer Interference Policy</i> and relevant <i>Water Sharing Plans</i>; - a detailed site water balance for the project, including water supply and wastewater disposal arrangements; - an assessment of the flood impacts of the project; and - a description of the erosion and sediment control measures that would be implemented to mitigate any impacts during construction; • Air Quality – including: <ul style="list-style-type: none"> - an assessment of the likely air quality impacts of the project in accordance with the <i>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW</i> (EPA, 2016); - ability to comply with the relevant regulatory framework, specifically the <i>Protection of the Environment Operations Act 1997</i> and the <i>Protection of the Environment Operations (Clean Air) Regulation 2010</i>; and - an assessment of the likely greenhouse gas impacts of the project; • Noise and Vibration – including: <ul style="list-style-type: none"> - assessment of the likely construction noise impacts of the project under the <i>Interim Construction Noise Guideline</i> (DECCW, 2009); - an assessment of the likely operational noise impacts of the project under the <i>NSW Noise Policy for Industry</i> (EPA, 2017); - an assessment of the likely road noise impacts of the project under the <i>NSW Road Noise Policy</i> (EPA, 2011); and - an assessment of the likely vibration amenity and structural impacts of the project under <i>Assessing Vibration: A Technical Guideline</i> (DEC, 2006) and <i>German Standard DIN 4150-3 Structural Vibration – effects of vibration on structures</i>; • Transport – including: <ul style="list-style-type: none"> - an assessment of the transport impacts of the project on the capacity, condition, safety and efficiency of the local and State road network including consideration of the future M1 Motorway extension to Raymond Terrace; - an assessment of the site access point and rail safety issues; - a description of the measures that would be implemented to mitigate any impacts during construction; and - a description of any proposed road upgrades developed in consultation with the relevant road authorities (if required); • Visual – including an assessment of the likely visual impacts of the project on the amenity of the surrounding area and private residences in the vicinity of the project;
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<ul style="list-style-type: none"> • Socio-Economic – including an assessment of the likely impacts on the local community, demands on Council infrastructure and consideration of the construction workforce accommodation; and • Waste – identify, quantify and classify the likely waste stream to be generated during construction and operation, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste.
Consultation	<p>During the preparation of the EIS, you must consult with the relevant local, State and Commonwealth Government authorities, infrastructure and service providers, community groups and affected landowners.</p> <p>The EIS must describe the consultation that was carried out, identify the issues raised during this consultation, and explain how these have been considered and addressed.</p>
Further consultation after 2 years	<p>If EIS for the project is not lodged within 2 years of the issue date of these Environmental Assessment Requirements, the Applicant must consult further with the Secretary in relation to the preparation of the EIS.</p>

ATTACHMENT 1

Environmental Planning Instruments, Policies, Guidelines & Plans

Water	
Groundwater	NSW State Groundwater Policy Framework Document and component policies (DPI)
	Relevant Water Sharing Plans
	NSW Aquifer Interference Policy 2012 (DPI)
Surface Water	National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC)
	Guidelines for Development in the Drinking Water catchments (Hunter Water, 2017)
	NSW State Rivers and Estuary Policy (DPI Water)
	NSW Government Water Quality and River Flow Objectives at http://www.environment.nsw.gov.au/ieo/
	Using the ANZECC Guideline and Water Quality Objectives in NSW (DEC, 2006)
	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG)
	Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DECC, 2008)
Contamination	Managing Urban Stormwater: Soils & Construction (Landcom)
	Technical Guidelines: Bunding & Spill Management (EPA)
	NSW Guidelines for Controlled Activities (various) (DPI)
	State Environmental Planning Policy No. 55 – Remediation of Land
Land and Soils	Managing Land Contamination – Planning Guidelines SEPP 55 – Remediation of Land (EPA)
	Guidelines for Consultants Reporting on Contaminated Sites (EPA)
	Contaminated Sites Sampling Design Guidelines 1995 (EPA)
	Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC)
	National Environment Protection (Assessment of Site Contamination) Measure 1999 (with amendment April 2013)
	Acid Sulfate Soils Manual (OEH)
	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (EPA)
	Managing Urban Stormwater: Soils & Construction (Landcom)
	Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC & NHMRC)
	National Environment Protection (Assessment of Site Contamination) Measure 1999 (with amendment April 2013)
Guidelines for developments adjoining land and water managed by the Department of Environment, Climate Change and Water (DECCW, 2010)	
The land and soil capability assessment scheme: Second approximation (OEH)	
Guidelines for Surveying Soil and Land Resources (CSIRO)	
Australian Soil and Land Survey Handbook (CSIRO)	
Soil and Landscape Issues in Environmental Impact Assessment (DPI)	

Biodiversity	<p>Biodiversity Assessment Method 2017 (OEH)</p> <p>Threatened Species Assessment Guidelines - Assessment of Significance (OEH)</p> <p>Biosecurity Act 2015</p> <p>Policy and Guidelines for Fish Habitat Conservation and Management – Update (DPI, 2013)</p> <p>NSW State Groundwater Dependent Ecosystem Policy (DPI Water)</p> <p>Risk Assessment Guidelines for Groundwater Dependent Ecosystems (DPI Water)</p> <p>Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (DPI)</p> <p>Fisheries Management Act 1994</p>
Heritage	<p>The Burra Charter (The Australia ICOMOS charter for places of cultural significance) Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH, 2011)</p> <p>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW, 2010)</p> <p>Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (OEH)</p> <p>NSW Heritage Manual (Heritage Office and Department of Urban Affairs and Planning, 1994)</p> <p>Assessing Heritage Significance (NSW Heritage Office, 2001)</p> <p>Statements of Heritage Impact (Heritage Office and Department of Urban Affairs and Planning, 2002)</p>
Air	<p>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA 2016)</p> <p>Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC, 2005)</p> <p>Technical Framework – Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006)</p> <p>National Greenhouse Accounts Factors (Commonwealth)</p>
Noise, Vibration and Blasting	<p>NSW Noise Policy for Industry (EPA)</p> <p>NSW Road Noise Policy and associated Application Notes (EPA)</p> <p>Interim Construction Noise Guideline (DECCW, 2009)</p> <p>Assessing Vibration: a Technical Guideline (DEC, 2006)</p> <p>German Standard DIN 4150-3: Structural Vibration – effects of vibration on structures</p> <p>Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZECC, 1990)</p>
Transport	<p>Guide to Traffic Generating Projects (RMS)</p> <p>Road Design Guide (RMS) & relevant Austroads Standards</p> <p>Austroads Guide to Traffic Management Part 12: Traffic Impacts of Project</p>
Hazards and Risks	<p>State Environmental Planning Policy No. 33 – Hazardous and Offensive Project</p> <p>Hazardous and Offensive Project Application Guidelines – Applying SEPP 33</p> <p>Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning</p> <p>Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis</p> <p>Hazardous Industry Planning Advisory Paper No. 11 – Route Selection</p>

AS2885 Pipelines – Gas and Liquid Petroleum, Operation and Maintenance

Planning for Bushfire Protection (NSW RFS)

Advisory Circular AC 139-05 v3.0 Plume Rise Assessments (CASA)

Visual

AS4282-1997 Control of the obtrusive effects of outdoor lighting

Waste

Waste Classification Guidelines (EPA)

Environmental Planning Instruments – General

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Three Ports) 2013

State Environmental Planning Policy (Coastal Management) 2018

Port Stephens Local Environmental Plan 2013

Relevant Water Sharing Plans (available at <https://www.industry.nsw.gov.au/water>)

ERM has over 160 offices across the following countries and territories worldwide

Argentina	New Zealand
Australia	Panama
Belgium	Peru
Brazil	Poland
Canada	Portugal
China	Puerto Rico
Colombia	Romania
France	Russia
Germany	Singapore
Hong Kong	South Africa
Hungary	South Korea
India	Spain
Indonesia	Sweden
Ireland	Taiwan
Italy	Thailand
Japan	UAE
Kazakhstan	UK
Kenya	US
Malaysia	Vietnam
Mexico	
The Netherlands	

ERM Sydney

Level 15
309 Kent Street
Sydney NSW 2000

T: +61 2 8584 8888

F: +61 2 9299 7502

www.erm.com