



Springvale Water Treatment Project

State Significant Development 7592
Environmental Impact Statement
Volume 2 - Appendix D1

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EnergyAustralia



Centennial Coal

Appendix D Heritage



Cultural Heritage Impact Assessment

Springvale Water Treatment Project

For Springvale Coal Pty Limited

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Acknowledgements

Centennial Coal would like to acknowledge the Traditional Custodians of the Blue Mountains in which it operates. Centennial also recognises that the territorial boundary and extent of each Aboriginal group's interest and spiritual and cultural connection to the Country varies.

We acknowledge the importance of the Traditional Owners in the greater understanding of the area, and special acknowledgement is extended to the Elders (past, present and future) for they are the holders of knowledge, traditions, culture and aspirations of the Aboriginal people.

Document Status

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Executive Summary

Springvale Coal Pty Ltd (Springvale Coal), a subsidiary of Centennial Coal (Western Operations), commissioned RPS to prepare an Aboriginal and historic heritage Cultural Heritage Impact Assessment (CHIA) for the proposed Springvale Water Treatment Project (the Project). The Project Application Area (PAA) comprises a twenty-metre wide linear pipeline corridor with a ten-metre wide disturbance footprint within the corridor extending between the existing Gravity Tank on Newnes Plateau and the Water Treatment Plant (WTP) location within the Mount Piper Power Station (MPPS) site. This also includes a network of pipelines from the WTP to the Springvale Coal Services Site (SCSS) and the cooling towers water system at MPPS (**Figure 7**).

An improved environmental outcome is proposed in the Project through the transfer of water from existing underground mine-dewatering facilities for treatment within the WTP and subsequent reuse in the MPPS's cooling water system. Treated water that cannot be used at MPPS will be discharged into Wangcol Creek, within the upper catchment of the Cocks River.

The main components of the Project shown in **Figure 1** comprise the following:

- The Gravity Tank Compound on Newnes Plateau
- A transfer pipeline from the Gravity Tank Compound to a new water treatment plant to be located at the Mount Piper Power Station (MPPS) site;
- A water treatment plant incorporating desalination processes for the treatment of water prior to use in the cooling water system at MPPS, or discharge to Wangcol Creek;
- A network of pipelines from the new water treatment plant to:
 - The cooling water system at MPPS (the Cooling Water Pipeline);
 - A new licensed discharge point (LDP) within the Springvale Coal Services Site for discharge into Wangcol Creek (the Treated Water Discharge Pipeline);
 - The tailings dams within the Springvale Coal Services Site for the transfer of residuals (the Residuals Pipeline); and
- A crystalliser to provide further treatment of the additional salt load generated within the MPPS cooling tower blowdown system.

Staged survey works and consultation began in 2011 and continued until 2016. There are two pipeline alignments proposed on Newnes Plateau: a northern alignment (Northern Study Area) and a southern alignment (Southern Study Area) (**Figure 2** and **Figure 3**, respectively). The Northern and Southern Study Areas are collectively referred to as the Project's Study Area. Centennial Coal have advised that the disturbance footprint for the pipeline corridor will not exceed ten metres in width and is wholly located within the Northern Study Area surveyed in this assessment. The eastern portion of the Study Area is located approximately 10 kilometres (km) north of Lithgow, while the western portion of the Study Area is situated approximately 18 km northwest of Lithgow. Lithgow is located in the South Eastern Highlands of the Blue Mountains area and is approximately 140 km from Sydney, NSW. The Project involves the transfer of water from existing underground mine dewatering facilities at Springvale Mine and Angus Place Colliery for industrial reuse at the MPPS.

The Project is classified as a State Significant Development (SSD) under the *State Environmental Planning Policy (State and Regional Development) 2011* which requires consent for the Project under Part 4 Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project is located in the Lithgow Local Government Area (LGA).

Springvale Mine and Angus Place Colliery operate a water management scheme incorporating a series of dewatering bore facilities on the Newnes Plateau for the management of safe water levels in the underground workings. Mine water from these two mines is currently discharged to Coxs River via a licensed discharge point. EnergyAustralia owns and operates the MPPS. The power station has a high demand for make-up water for use in the cooling water system. Water is drawn from the Coxs River and Fish River water supply schemes. An improved environmental outcome is proposed through the transfer of mine water from existing underground mine dewatering facilities for treatment and reuse at the MPPS. Discharge of treated water to Wangcol Creek (within the upper Coxs River catchment) will only occur when MPPS is operating at a reduced capacity. The MPPS operates as a zero discharge site with no release water by-products from the cooling water system to receiving waters.

This report has been prepared for inclusion in the Environmental Impact Statement (EIS) prepared under Division 4.1 of Part 4 of the EP&A Act and has been prepared in accordance with the relevant legislation (**Appendix 1**). The aim of this document is to assist regulators in understanding the potential impacts to Aboriginal and historical heritage items resulting from the proposed Project.

The Aboriginal Cultural Heritage Consultation Requirements (ACHCRs) for proponents (DECCW 2010) have been followed in this Project. This report considers the environmental and archaeological context of the Study Area including results from a search of the Aboriginal Heritage Information Management System (AHIMS) database (**Appendix 2**) and the relevant Historic Heritage databases.

This CHIA has undertaken the necessary background research and visual inspections required to identify historic and Aboriginal heritage and assessed the potential impact of the proposed works in relation to the installation of the pipeline.

This assessment has identified that the curtilage of The Cottage (Item Number I191) on Lot 101, DP829410 Castlereagh Highway, a historic heritage item listed on the Lithgow LEP, extends into the Study Area; however, the heritage buildings associated with this item are located approximately 200 metres east of the Study Area (**Figure 4**). The Study Area encapsulates a 10 metre x 10 metre section of the western part of the curtilage. The proposed works will have minor visual impact on this heritage item, but will not harm any built heritage and thus satisfies Section 121S (2) of the EP&A Act. Works should be limited to the 10 metre x 10 metre area identified.

One unlisted heritage item the European Surveyor's Tree (EST JN1) abuts the Study Area. As such, this area should be clearly marked as a No Go Zone to prevent access during construction and thus prevent harm to the heritage item by the proposed works (**Figure 6**).

There are seven extant Aboriginal sites in proximity to the Study Area: AHIMS #45-1-0210, AHIMS #45-1-0218, AHIMS #45-1-0237 (artefact scatters), AHIMS #45-1-2721, #45-1-2723, #45-1-2724 (isolated finds) and AHIMS #45-1-2758 (scarred tree) (**Figure 5**). Due to their proximity to the Study Area each of these sites should be clearly marked as NO GO ZONE areas (**Figure 6**) to prevent access during construction and thereby prevent harm to the Aboriginal objects at these sites.

It should be noted that there are currently heritage management plans which have been prepared for Aboriginal and Historic heritage for Centennial Coal's Western operations: Centennial's *Western Holdings Aboriginal Cultural Heritage Management Plan 2014* (ACHMP) (Centennial Coal 2014) and Centennial's *Historic Heritage Management Plan Western Holdings 2014* (HHMP) (Centennial Coal 2016). These management plans will be updated with the current Project as required following approval.

Recommendation 1

The proposed works within the curtilage of The Cottage (1191) must be limited to the 10 metre x 10 metre section of the Project Application Area and not further encroach on the curtilage of this item (**Figure 4**).

Recommendation 2

The proposed works must be limited to the defined Project Application Area. NO GO ZONE areas should be marked prior to and during construction for: European Surveyor's Tree (EST JN1), AHIMS #45-1-0210, AHIMS #45-1-0218, AHIMS #45-1-0237 (artefact scatters), AHIMS #45-1-2721, #45-1-2723, #45-1-2724 (isolated finds) and AHIMS #45-1-2758 (scarred tree) (**Figure 6**).

Recommendation 3

If during works suspected Aboriginal or skeletal material is identified then procedures outlined in Centennial's *Western Holdings Aboriginal Cultural Heritage Management Plan 2014* (ACHMP) (Centennial Coal 2014) must be followed.

Recommendation 4

If during works suspected historic material is identified then procedures outlined in Centennial's *Historic Heritage Management Plan Western Holdings 2014* (HHMP) (Centennial Coal 2016) must be followed.

Terms, Definitions and Abbreviations

Abbreviation/Term	Meaning
Aboriginal Culturally Modified Tree/ Scarred Tree	“Means a tree that, before or concurrent with (or both) the occupation of the area in which the tree is located by persons of non-Aboriginal extraction, has been scarred, carved or modified by an Aboriginal person by: (a) the deliberate removal, by traditional methods, of bark or wood from the tree, or (b) the deliberate modification, by traditional methods, of the wood of the tree” NPW Regulation 80B (3). Culturally Modified trees are sometimes referred to as scarred trees.
Aboriginal Object	“Any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains” (DECCW 2010:18).
Aboriginal Place	“A place declared under s.84 of the NPW Act that, in the opinion of the Minister, is or was of special significance to Aboriginal culture” (DECCW 2010:18). Aboriginal places are gazetted by the minister.
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHCR	Aboriginal Cultural Heritage Consultation Requirements for Proponents.
ACHMP	Aboriginal Cultural Heritage Management Plan
Activity	A project, development, or work (this term is used in its ordinary meaning and is not restricted to an activity as defined by Part 5 EP&A Act 1979).
AHIMS	Aboriginal Heritage Information Management System.
BP	Years before present as determined by radiocarbon dating. Sometimes these dates are calibrated (cal. years BP) this indicates a radiocarbon date has been calibrated using the dendrochronology curves, making the date more accurate than an uncalibrated date.
CHIA	Cultural Heritage Impact Assessment
DECCW	Parts of the former Department of Environment, Climate Change and Water (is now the Office of Environment and Heritage – OEH).
Development area	“Area proposed to be impacted as part of a specified activity or development proposal” (OEH 2011:ii). This report has used proposed impact area to mean the same as development area.
DGRs	Director-General’s Requirements issued by DoPI.
Disturbed Land	“Land is disturbed if it has been the subject of a human activity that has changed the land’s surface, being changes that remain clear and observable.” (DECCW 2010:18).
DoPI	Department of Planning and Infrastructure (from April 2011) previously known as Department of Planning (DoP).
Due Diligence	“Taking reasonable and practical steps to determine whether a person’s actions will harm an Aboriginal object and, if so, what measures can be taken to avoid that harm” (DECCW 2010:18).
EIS	Environmental Impact Statement.
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i> .
GDA	Geodetic Datum Australia.
GIS	Geographic Information System.
GSE	Ground Surface Exposure.
GSV	Ground Surface Visibility.
GTC	Gravity Tank Compound
Harm	“Destroy, deface, damage an object, move an object from the land on which it is situated, cause or permit an object to be harmed.” (DECCW 2010:18).
LALC	Local Aboriginal Land Council.

Abbreviation/Term	Meaning
LDP	Licensed Discharge Point
LEP	Local Environmental Plan
LGA	Local Government Area.
ML	Mining Lease.
MPPS	Mount Piper Power Station
NPW Act	NSW <i>National Parks and Wildlife Act 1974</i> (administered by OEH).
NPW Regulation	NSW <i>National Parks and Wildlife Regulation 2009</i> (administered by OEH).
NPWS	National Parks and Wildlife Service.
OEH	Office of Environment and Heritage (formerly DECCW).
PAD	Potential Archaeological Deposit.
Project Application Area	A twenty-metre wide linear pipeline corridor with a ten-metre wide disturbance footprint within the corridor extending between the existing Gravity Tank on Newnes Plateau and the Water Treatment Plant (location within the Mount Piper Power Station and associated infrastructure)
The Project	Springvale Water Treatment Project
RAP	Registered Aboriginal Party
Springvale Coal	Springvale Coal Pty Ltd
SCSS	Springvale Coal Services Site
Study Area	"The area that is the subject of archaeological investigation. Ordinarily this would include the area that is being considered for development consent, inclusive of the proposed development footprint" (OEH 2011:ii).
WTP	Water Treatment Project

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1.0 Introduction

Springvale Coal Pty Ltd Limited, a subsidiary of Centennial Coal (Western Operations) requires an Aboriginal and historic heritage Cultural Heritage Impact Assessment (CHIA) that will be integrated along with other specialist assessments into an Environmental Impact Statement (EIS). This report is for the proposed Springvale Water Treatment Project (the Project) which involves the transfer of water from existing underground mine dewatering facilities at Springvale Mine and Angus Place Colliery for industrial reuse at the Mount Piper Power Station's (MPPS) cooling water system following treatment in a new water treatment plant. Treated water not able to be reused will be discharged to Wangcol Creek (**Figure 1**).

The Project is classified as a State Significant Development (SSD) under the *State Environmental Planning Policy (State and Regional Development) 2011* which requires consent for the Project under Part 4 Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project is located in the Lithgow Local Government Area (LGA).

The objectives of this CHIA are to provide an assessment of the Study Area for Aboriginal heritage values, to identify whether Aboriginal sites, objects or places would be impacted by the proposed works, and to provide appropriate mitigation and management recommendations, where required. This CHIA also identifies whether non-Indigenous heritage sites, objects or places would be impacted by the proposed works, and to provide appropriate mitigation and management recommendations, as required.

This Aboriginal and non-Indigenous CHIA report has been prepared in accordance with the following guidelines:

- *Aboriginal cultural heritage consultation requirements for proponents 2010* (NSW Department of Environment, Climate Change and Water [DECCW] 2010a) (the ACHCRs);
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b);
- *Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (NSW Office of Environment and Heritage [OEH] (2011);
- *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (NSW Department of Environment and Conservation [DEC] 2005);
- *Burra Charter* (Australia ICOMOS 2013)
- *Ask First; A Guide to Respecting Indigenous Heritage Places and Values* (Australian Heritage Commission 2002);
- *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010) ("Due Diligence Code");
- *NSW Minerals Industry Due Diligence Code of Practice for the Protection of Aboriginal Objects* (Minerals Council 2010) ("Minerals Due Diligence Code");
- *NSW Heritage Manual* (NSW Heritage Office 1996);
- *Statements of Heritage Impact* (Heritage Office and Department of Urban Affairs and Planning 2002).

1.1 Project Application Area

The Project Application Area (PAA) comprises a twenty metre wide linear pipeline corridor containing a ten metre wide disturbance footprint within that corridor. The PAA extends from the existing Gravity Tank on Newnes Plateau and the Water Treatment Plant location within the Mount Piper Power Station (MPPS) site.

Associated infrastructure including the existing Gravity Tank site compound, the water treatment plant location at MPPS and a network of pipelines from the water treatment plant to the Springvale Coal Services Site and the cooling water system at MPPS (**Figure 4**). This PAA corresponds to the Northern Study Area (Refer Section 1.3) and includes the northern pipeline alignment. This pipeline alignment has been selected due to a smaller disturbance or impact footprint (27.84 ha) compared to the southern pipeline alignment assessed in the Southern Study Area.

1.2 Project Description

The Water Treatment Project (WTP) will include the installation of a water transfer pipeline and associated infrastructure. The key elements of the Project include:

- A pipeline system to transfer up to 36 ML/day of dewatered mine water from the existing gravity tank forming a part of the Springvale Mine's approved dewatering facilities on the Newnes Plateau to a new water treatment plant at the MPPS site;
- A new water treatment plant at the MPPS incorporating the desalination processes to reduce the salinity in mine water to a standard suitable for either industrial reuse or environmental release;
- Transfer of treated water from the water treatment plant to the MPPS cooling water system (Cooling Water Pipeline) to contribute to the demand for make-up water;
- Transfer of any excess treated water via a pipeline to a new licensed discharge point (LDP) located in the Springvale Coal Services site (Western Coal Services Project, SSD 5579) for environmental release to Wangcol Creek (the Treated Water Discharge Pipeline);
- Transfer of the saline brine stream from water treatment plant to the MPPS cooling water blowdown system for integration with existing treatment and brine disposal practices (the Residuals Pipeline); and
- installation of a crystalliser to provide further treatment of the additional salt load generated within the MPPS cooling tower blowdown system.

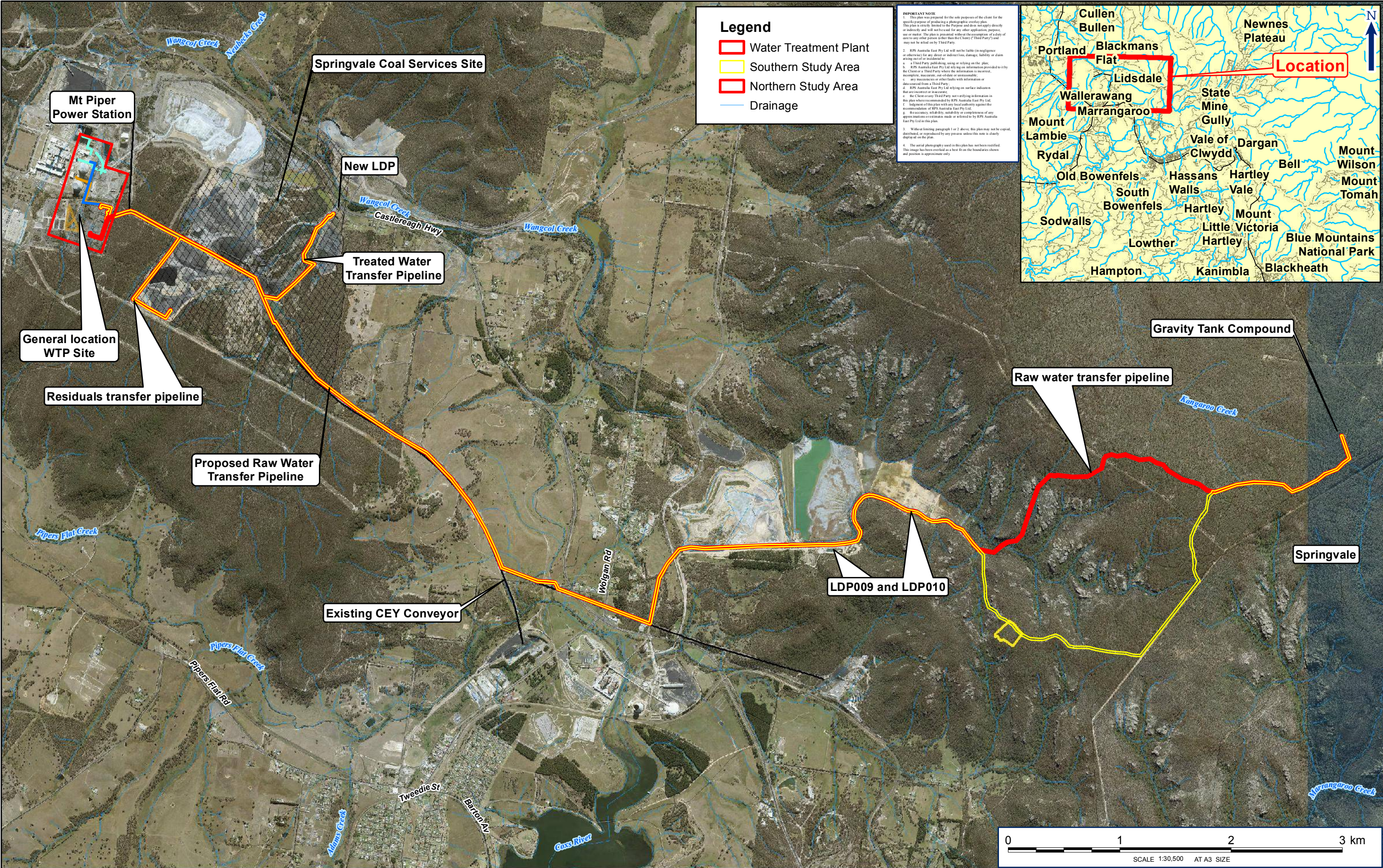
1.3 The Study Area

This impact assessment report has been prepared for the Project's Study Area (**Figure 1**) which comprises the Northern Study area and the Southern Study Area, corresponding to, respectively, a northern (**Figure 2**) and southern (**Figure 3**) alignment, which have both been investigated in this report. The Northern and Southern Project areas are collectively referred to as the Study area. The Study Area is located within the Lithgow Local Government Area (LGA).

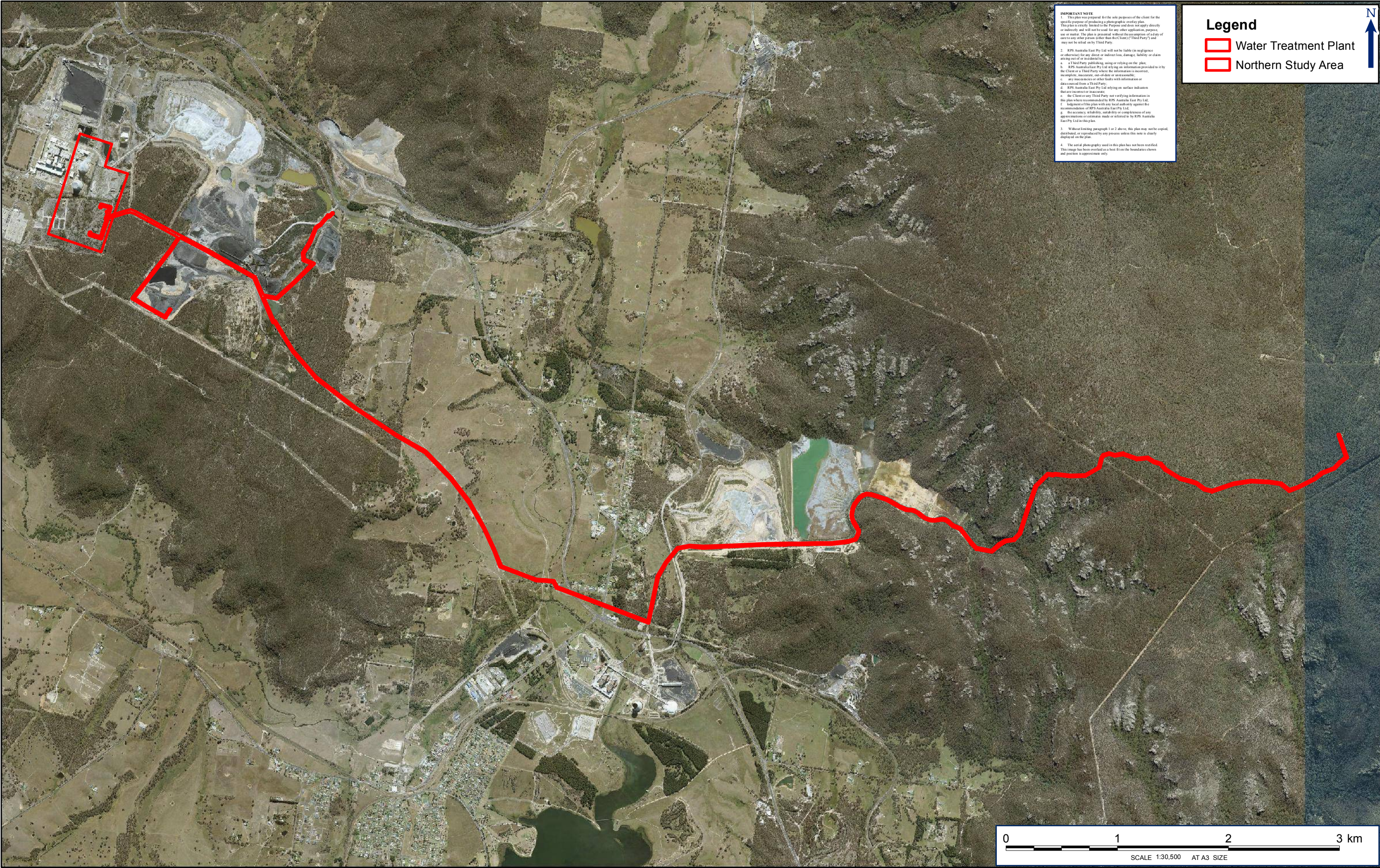
The western portion of the Study Area in the vicinity of MPPS is surrounded by industrial and agricultural lands accommodating infrastructure, cleared lands and road networks. The eastern portion of the Study Area is on the Newnes Plateau within Newnes State Forest managed by Forestry Corporation of NSW. The central portions of the Study Area are situated within Centennial owned lands, private lands and EnergyAustralia lands with uses such as mining, forestry, pastoral farming and energy resources. The impact or disturbance footprint is a linear 10 m wide easement located within the Study Area traversing from the Gravity Tank in the east to the MPPS in the west and includes the gravity tank compound, the cooling tower pipeline, the treated water discharge pipeline, the residuals transfer pipeline, the LDP, tailings dams and the water treatment plant footprint. The eastern end of the Study Area is located approximately 10 km north of Lithgow, with the western end situated approximately 18 km northwest of Lithgow. Lithgow is located in the South Eastern Highlands in the Blue Mountains and is approximately 140 km from Sydney, NSW.

I.4 Acknowledgments

The Aboriginal component of this report has been written by suitably qualified heritage professionals in accordance with s1.6 and r1 of the Code of Practice for Archaeological Investigation (DECCW 2010:4,20). RPS Senior Cultural Heritage Consultant Gillian Goode prepared this report assisted by RPS Cultural Heritage Consultant Jo Nelson. Newcastle Cultural Heritage Manager Tessa Boer-Mah reviewed the report.



TITLE : FIGURE 1: STUDY AREA	LOCATION : SPRINGVALE	DATUM:GDA 1994	DATE : 15/08/2016	VERSION (PLAN BY): B A3 (Natalie.Wood)
		PROJECTION: GDA 1994 MGA Zone 56	PURPOSE: HERITAGE	PATH: J:\OBS\Centennial\All Jobs\131758 JV Energy Australia Springvale\10 - Drafting\Arcgis Map Documents\Arch\Report Figures\131758 Figure 1 Location B A3 20160812.mxd



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Legend

Water Treatment Plant

Northern Study Area

N

TITLE : **FIGURE 2: NORTHERN STUDY AREA**

LOCATION : **SPRINGVALE**

DATUM:GDA 1994

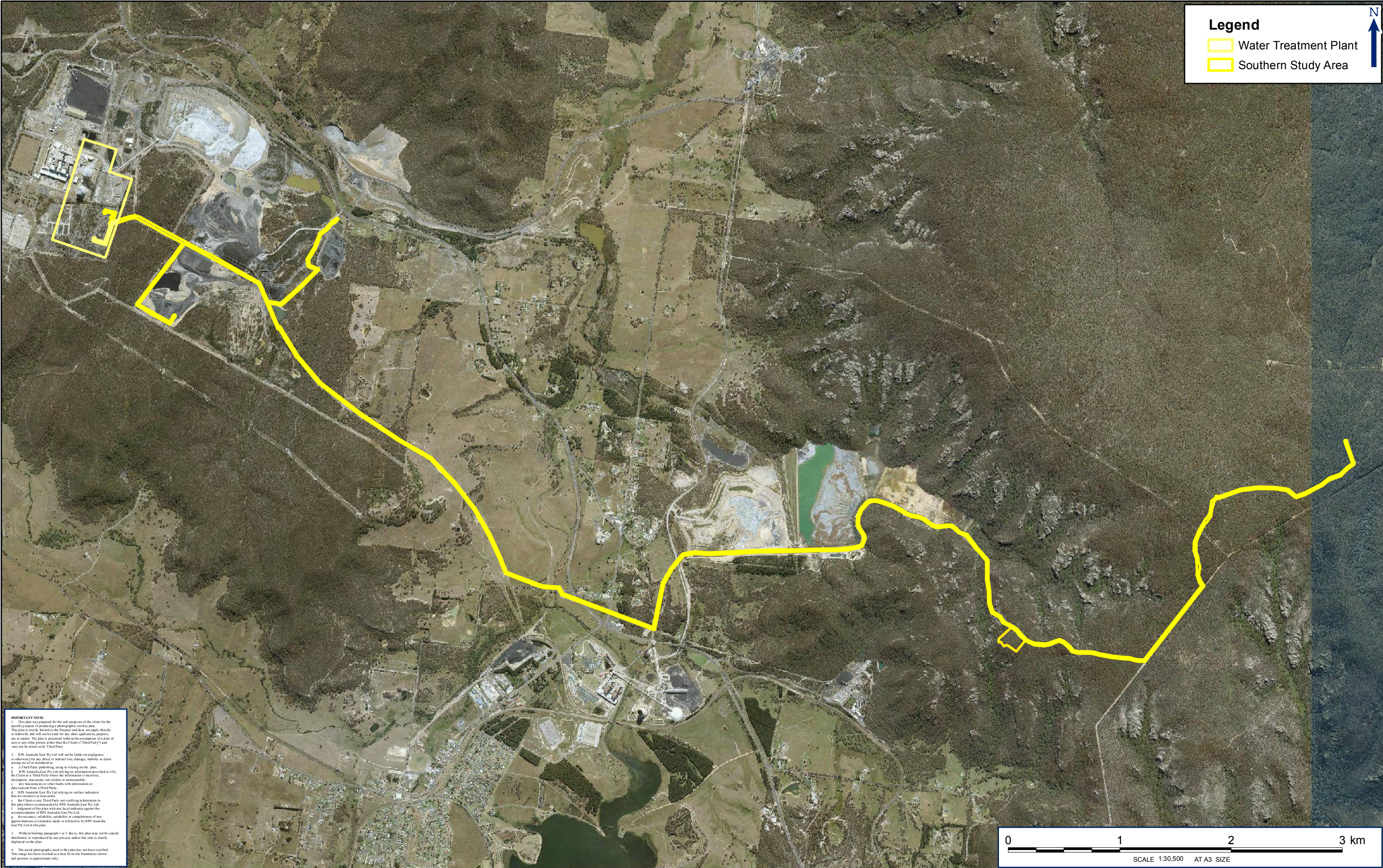
DATE : **15/08/2016**

VERSION (PLAN BY): AA3 (Natalie.Wood)

PROJECTION: GDA 1994 MGA Zone 56

PURPOSE: **HERITAGE**

PATH: J:\JOBS\Centennial\All Jobs\131758 JV Energy Australia Springvale\10 - Drafting\Arcgis Map Documents\Arch\Report Figures\131758 Figure 2 North B A3 20160812.mxd



TITLE : FIGURE 3: SOUTHERN STUDY AREA	LOCATION : SPRINGVALE	DATUM:GDA 1994	DATE : 15/08/2016	VERSION (PLAN BY): B A3 (Natalie.Wood)
PROJECTION: GDA 1994 MGA Zone 56		PURPOSE: HERITAGE		PATH: J:\OBS\Centennial\All Jobs\131758 JV Energy Australia Springvale\10 - Drafting\Arcgis Map Documents\Arch\Report Figures\131758 Figure 3 South B A3 20160812.mxd

2.0 Legislative Context

This project is being assessed primarily in accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act) and it is under this legislation that the Secretary's Environmental Assessment Requirements (SEARs) for the Project have been issued and addressed in this report. The legislation and regulations that protect Aboriginal heritage and historic heritage have also been outlined.

2.1 Environmental Planning and Assessment Act 1979

The EP&A Act regulates a system of environmental planning and assessment for New South Wales. Land use planning requires that environmental impacts are considered, including the impact on cultural heritage and specifically Aboriginal heritage. Within the EP&A Act, Parts 3, 4 and 5 relate to Aboriginal heritage.

Part 3 regulates the preparation of planning policies and plans. Part 4 governs the manner in which consent authorities determine development applications and outlines those that require an environmental impact statement. Part 5 regulates government agencies that act as determining authorities for activities conducted by that agency or by authority from the agency. The National Parks & Wildlife Service is a determining authority under Part 5 of the EP&A Act.

Under 4.1 of EP&A Act, a development may be declared a State Significant Development (SSD) if it meets specific criteria. The consent authority for a state significant development is the Minister, although under Section 23 the minister may delegate consent authority function to the Planning Assessment Commission, the Secretary or to any other public authority. An AHIP under section 90 of the NPW Act is not required for developments which have been declared a SSD in accordance with 89J (1)(d) of the EP&A Act. However, an EIS is still required for an SSD and SEARs typically issued will include provisions for the assessment and management of Aboriginal heritage, as well as Aboriginal consultation.

The EP&A Act ensures that Aboriginal and historic heritage is properly assessed in land use planning and development.

2.2 Aboriginal Cultural Heritage

Although there are a number Acts and regulations protecting and managing cultural heritage in New South Wales (see **Appendix 1**); the primary ones which apply to this report include:

- *National Parks and Wildlife Act 1974* (as amended)
- *National Parks and Wildlife Regulation 2009*
- *Environmental Planning and Assessment Act 1979*

In brief, the *National Parks and Wildlife Act 1974* (as amended) protects Aboriginal heritage (places, sites and objects) within NSW; the *National Parks and Wildlife Regulation 2009* provides a framework for undertaking activities and exercising due diligence.

2.2.1 National Parks & Wildlife Act 1974 (as amended)

The *National Parks and Wildlife Act 1974* (as amended) (NPW Act) protects Aboriginal heritage (places, sites and objects) within NSW. Protection of Aboriginal heritage is outlined in s86 of the NPW Act, as follows:

- "A person must not harm or desecrate an object that the person knows is an Aboriginal object" s86(1),
- "A person must not harm an Aboriginal object" s86(2)

- “A person must not harm or desecrate an Aboriginal place” s86(4).

Penalties apply for harming an Aboriginal object or place. The penalty for knowingly harming an Aboriginal object (s86[1]) and/or an Aboriginal place (s86[4]) is up to \$550,000 for an individual and/or imprisonment for 2 years; and in the case of a corporation the penalty is up to \$1.1 million. The penalty for a strict liability offence (s86[2]) is up to \$110,000 for an individual and \$220,000 for a corporation.

Harm under the NPW Act is defined as any act that; destroys defaces or damages the object, moves the object from the land on which it has been situated, causes or permits the object to be harmed. However, it is a defence from prosecution if the proponent can demonstrate 1) that harm was authorised under an Aboriginal Heritage Impact Permit (AHIP) (and the permit was properly followed), or 2) that the proponent exercised due diligence in respect to Aboriginal heritage. The **‘due diligence’ defence (s87(2))**, declares that: if a person or company has exercised due diligence to ascertain that no Aboriginal object was likely to be harmed as a result of the activities proposed for the Project Area; then liability from prosecution under the NPW Act will be removed or mitigated if it later transpires that an Aboriginal object was harmed. If any Aboriginal objects are identified during the activity, then works should cease in that area and Office of Environment and Heritage (OEH) notified (DECCW 2010:13). The due diligence defence does not authorise continuing harm.

Notification of Aboriginal Objects

Under s89A of the NPW Act Aboriginal objects (and sites) must be reported to the Director-General of OEH within a reasonable time (unless it has previously been recorded and submitted to AHIMS). Penalties of \$11,000 for an individual and \$22,000 for a corporation may apply for each object not reported.

2.2.2 National Parks and Wildlife Regulation 2009

The *National Parks and Wildlife Regulation 2009* (NPW Regulation) provides a framework for undertaking activities and exercising due diligence in respect to Aboriginal heritage. The NPW Regulation outlines the recognised due diligence codes of practice which are relevant to this report, but it also outlines procedures for Aboriginal Heritage Impact Permit (AHIP) applications and Aboriginal Cultural Heritage Consultation Requirements (ACHCRs) (DECCW 2010); amongst other regulatory processes.

2.2.3 Native Title Act

The Commonwealth Government enacted the *Native Title Act (1993)* to formally recognise and protect native title rights in Australia following the decision of the High Court of Australia in *Mabo & Ors v Queensland* (No. 2) (1992) 175 CLR 1 (“Mabo”).

Although there is a presumption of native title in any area where an Aboriginal community or group can establish a traditional or customary connection with that area, there are a number of ways that native title is taken to have been extinguished. For example, land that was designated as having freehold title prior to 1 January 1994 extinguishes native title, as does any commercial, agricultural, pastoral or residential lease. Land that has been utilised for the construction or establishment of public works also extinguishes any native title rights and interests for as long as they are used for that purpose. Other land tenure, such as mining leases, may be subject to native title, depending on when the lease was granted.

2.2.4 Aboriginal Land Rights Act 1983

The purpose of this legislation is to provide land rights for Aboriginal people within NSW and to establish Local Aboriginal Land Councils (LALCs). The land able to be claimed by LALCs, on behalf of Aboriginal people, includes Crown Land that (s36):

- Is able to be lawfully sold, leased, reserved or dedicated;
- Is not lawfully used or occupied;
- Does not comprise lands which, in the opinion of the Crown Lands Minister, are needed or are likely to be needed for residential purposes;
- Are not needed, nor likely to be needed for an essential public purpose;
- Does not comprise land under determination by a claim for native title; and
- Is not the subject of an approved determination under Native Title.

Claims for land are by application to the Office of the Registrar, Aboriginal Land Rights Act (1983).

2.2.5 Guidelines

2.2.5.1 ICOMOS Burra Charter

The ICOMOS Burra Charter defines the basic principles and procedures to be followed in the conservation of cultural heritage in Australia. Article 2 declares “The aim of conservation is to retain the cultural significance of a place’ and must include provision for its security, its maintenance and its future.” The principles that are set out in the Burra Charter guide and inform the assessment of significance of a place. As noted above, Cultural Significance means aesthetic, historic, scientific, or social value for past, present or future generations. Significance assessments are a helpful tool in the management of cultural heritage resources through allowing managers to make informed decisions especially in land use issues. Definitions of these concepts of significance are (Australia ICOMOS 1999):

- Aesthetic value (visual aspects of site);
- Scientific value or research potential (rarity, quality and representativeness of site);
- Social value (spiritual, political and cultural aspects of site); and
- Historic value (aesthetic, scientific and social values combined).

Aesthetic value encompasses aspects of sensory perception including form, scale, colour, texture and material of the fabric. Scientific value is the importance of the item in relation into its rarity, quality or representativeness. Social value encompasses the spiritual, political, national or other associations to a majority or minority group. Historic value is the history of the place, its association with historic figure and/or its role in a historical event.

2.2.5.2 Ask First: A Guide to Respecting Indigenous Heritage Places and Values

Ask First (2002) was commissioned by the Australian Heritage Commission to help Australians protect different aspects of their natural and cultural heritage places, and is intended to be complementary to the Australia ICOMOS Burra Charter and the Australian Natural Heritage Charter. Ask First is a practical guide for land developers, land users and managers, cultural heritage professionals and others who may have an impact on Indigenous heritage. The main focus of the guidelines is to emphasise that consultation and negotiation with Indigenous stakeholders is the best means of addressing Indigenous heritage issues. The guidelines also emphasise the need to comply with relevant Territory and Commonwealth Indigenous cultural heritage legislation and statutory authorities.

Ask First states that in recognising the rights and interests of Indigenous peoples in their heritage, all parties concerned with identifying, conserving and managing this heritage should acknowledge, accept and act on the principles that Indigenous people:

- Are the primary source of information on the value of their heritage and how it is best conserved;
- Must have an active role in any Indigenous heritage planning process;
- Must have input into primary decision-making in relation to Indigenous heritage so that they can continue to fulfil their obligations towards this heritage; and
- Must control intellectual property and other information relating specifically to their heritage, as this may be an integral aspect of its heritage value.

2.3 Historic Heritage Legislative Framework

2.3.1 Commonwealth Heritage Protection

At the Commonwealth level, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides for the management and protection of Australia's heritage places, including World Heritage properties. It provides for the listing of natural, historic or Indigenous places that are of outstanding national heritage value to the Australian nation, as well as heritage places on Commonwealth lands and waters or under Australian Government control.

2.3.2 State Heritage Protection

Heritage protection and management in NSW is afforded under the *National Parks and Wildlife Act 1974* and the *Heritage Act 1977*. Under these Acts heritage permits are required for any works with the potential to impact on heritage, including built heritage and archaeological heritage. Historic heritage items are assessed in terms of level of significance, that is, they are of State level significance or of local significance.

Historical archaeological relics, buildings, structures, archaeological deposits and features with State heritage significance are protected under the *Heritage Act 1977* (and subsequent amendments) and may be identified on the SHR or by an active Interim Heritage Order (IHO). Approval must be gained from the NSW Heritage Council when making changes to a place listed on the SHR or a place covered by an IHO. That approval is sought through lodgement of a s.57 or a s.60 application prior to commencement of works.

Section 170 of the *Heritage Act 1977* requires each State Government agency to keep records of heritage items owned or operated by it. The management of s170 Register items needs to be in line with the *State Agency Heritage Guide* (2001) under the *Heritage Act 1977* s.170A (3), and for rail infrastructure, also the *Asset Management Strategy* (2011).

Approval from the NSW Heritage Division is required when excavating any land in NSW where there is potential of disturbing an archaeological relic (of non-Indigenous origin). Under the *Heritage Act 1977* a 'relic' is defined as any deposit, artefact, object or material evidence that:

- (a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and
- (b) is of State or local heritage significance

The application type required to gain approval is dependent on whether the site is of local or state significance. The following provides an overview.

2.3.3 Local Heritage Protection

The EP&A Act and its regulations, schedules and associated guidelines require that environmental impacts are considered in land use planning and development assessment. The EP&A Act defines 'environment' as '...all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her

social groupings.’ The environment therefore includes cultural heritage. Heritage items and places are described in LEPs and shown on the heritage maps which accompany the LEP. All LEPs contain clauses dealing with heritage conservation. Under the EP&A Act all local governments in NSW are required to maintain a register of heritage places as Schedule 5 under their LEP.

The proposed works would be carried out under the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP). This legislation is intended to facilitate the delivery of infrastructure across NSW. The proposed works are development that is permissible without consent, however a requirement of the EP&A Act is that assessment be conducted under Part 5 (environmental assessment).

Under the Infrastructure SEPP, a public authority or a person acting on behalf of a public authority, must not carry out development that would impact on a heritage item unless the authority or the person has:

- (a) had an assessment of the impact prepared, and
- (b) given written notice of the intention to carry out the development, with a copy of the assessment, to the council for the area in which the heritage item or heritage conservation area (or the relevant part of such an area) is located, and
- (c) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.

3.0 Aboriginal Consultation

Aboriginal consultation has been undertaken in accordance with the Aboriginal Cultural Heritage Consultation Requirements (DECCW 2010). The Aboriginal consultation has been undertaken over a number of years and is summarised in **Table 1** and the Registered Aboriginal Party (RAP) list compiled in **Table 2**. The RAPs have been consulted in relation to survey methodologies (**Table 3**), with the majority having participated in the surveys (Table 4).

A gap analysis identified areas along the pipeline route that required visual inspection. The majority of the Study Area for the Project was previously surveyed by RPS with representatives from the RAPs. Due diligence visual inspection of parts of the Study Area was also undertaken with an invite to the groups to participate.

Table 1 Summary of main stages of the ACHCRs for each Project

ACHCRs Due Dates for each component per Project					
Stage	Component	Western Coal Services CHIA	Lidsdale Siding CHIA	Water Treatment Project CHIA	Springvale Mine Extension Project CHIA
1	Newspaper Job Advert	22/11/2011	06/10/2011	06/10/2011	06/10/2011
	Expression of Interest Letters	23/11/2011	20/10/2011	20/10/2011	20/10/2011
2 & 3	Response to Survey Methodology	20/11/2012	06/12/2011	13/01/2016	23/12/2011
	Invite to Site/Survey	13/01/2012	16/12/2011	28-29/01/2016	30/05/2013
4	Feedback of Draft Report	24/19/2012	16/08/2012	See Note 1 below	27/04/2012 & 10/07/2013

Feedback received from the RAPs for the Western Coal Services CHIA, Lidsdale Siding CHIA and Springvale Mine Extension Project CHIA Reports.

Table 2 Registered Aboriginal Parties

Registered Aboriginal Parties
Warrabinga Native Title Claimants Aboriginal Corporation
North-East Wiradjuri
Bathurst Local Aboriginal Land Council
Gundungurra Tribal Council Aboriginal Corporation
Mingaan Aboriginal Corporation
Mooka Traditional Owners
Wiray-dyuraa Ngumnbaay-dyil
Wiray-dyuraa Maying-gu
Wiradjuri Council of Elders
Gundungurra Tribal Council Aboriginal Corporation Native Title Claimants
Wiray-dyuraa Ngambaay-dyil and Wiray-dyuraa Maying-gu
Warrabinga/Wiradjuri People Native Title Claimants

The Survey Methodology and Information Gathering Letter Reports were provided to each of the RAPs that had registered an interest at Stage 1 of the OEH ACHCR process for each of the Study Areas. Both hardcopy and electronic copies were provided to each of the Aboriginal stakeholder groups for the purpose of obtaining comments or feedback. **Table 3** lists those groups who responded to the request for comment or feedback to the methodology contained within the report.

Table 3 Aboriginal Stakeholder responses to survey methodology for each previous project

Western Coal Services CHIA	Lidsdale Siding CHIA	Water Treatment Project ACHAR	Springvale Mine Extension Project CHIA
Warrabinga Native Title Claimants Aboriginal Corporation	Warrabinga Native Title Claimants Aboriginal Corporation	Mingaan Aboriginal Corporation	Mingaan Aboriginal Corporation
North-East Wiradjuri	North-East Wiradjuri	Warrabinga Native Title Claimants Aboriginal Corporation	Warrabinga Native Title Claimants Aboriginal Corporation
Bathurst Local Aboriginal Land Council	Bathurst Local Aboriginal Land Council	Wiray-dyuraa Ngambaay-dyil	Wiray-dyuraa Ngambaay-dyil and Wiray-dyuraa Maying-gu
Gundungurra Tribal Council Aboriginal Corporation	Gundungurra Tribal Council Aboriginal Corporation	Wiray-dyuraa Maying-gu	Gundungurra Tribal Council Aboriginal Corporation
Mingaan Aboriginal Corporation	Mingaan Aboriginal Corporation	Gundungurra Tribal Council Aboriginal Corporation	North East Wiradjuri Company Ltd
Mooka Traditional Owners	Wiray-dyuraa Ngumbaa-dyil	North East Wiradjuri Aboriginal Corporation	Bathurst Local Aboriginal Land Council
Wiray-dyuraa Ngumbaa-dyil		Bathurst Local Aboriginal Land Council	
Wiray-dyuraa Maying-gu			
Wiradjuri Council of Elders			

Representatives from the following RAP Groups participated in the visual inspection of the Study Area (**Table 4**).

Table 4 Field survey participants for each previous project

Western Coal Services CHIA	Lidsdale Siding CHIA	Water Treatment Project ACHAR	Springvale Mine Extension Project CHIA
	North-East Wiradjuri	North East Wiradjuri Aboriginal Corporation	Gundungurra Tribal Council Aboriginal Corporation
Warrabinga Native Title Claimants Aboriginal Corporation	Bathurst Local Aboriginal Land Council	Gundungurra Tribal Council Aboriginal Corporation Native Title Claimants	Warrabinga Native Title Claimants Aboriginal Corporation
North-East Wiradjuri	Gundungurra Tribal Council Aboriginal Corporation	Mingaan Aboriginal Corporation	North East Wiradjuri Company Ltd.
Bathurst Local Aboriginal Land Council		Warrabinga/Wiradjuri People Native Title Claimants	Mingaan Aboriginal Corporation
Gundungurra Tribal Council Aboriginal Corporation			Bathurst Land Council
Mingaan Aboriginal Corporation			Wiraydyuraa Ngambaay-dyil & Wiray-dyuraa Maying-gu

Western Coal Services CHIA	Lidsdale Siding CHIA	Water Treatment Project ACHAR	Springvale Mine Extension Project CHIA
Mooka Traditional Owners			
Wiray-dyuraa Ngumbaa-dyil			
Wiray-dyuraa Maying-gu			
Wiradjuri Council of Elders			

Copies of the reports were provided to each of the RAPs that had registered an interest at Stage 1 of the OEH ACHCR process for each section of the Project. Both hardcopy and electronic copies were provided to each of the Aboriginal stakeholder groups in **Table 3** for the purpose of obtaining comments/feedback about the report.

A total of 28 days is provided to the representatives for responses and comments to each of the reports, as stated in Section 4.4, subsection 4.4.3 of the OEH ACHCRs. Reminders were issued to the Aboriginal Stakeholder groups one day prior to the closing date for receiving comments and feedback. The detailed consultation log for these previous projects is located in **Appendix 3** of this report.

4.0 Historic Heritage Context

The heritage items are selected on the basis of how they demonstrate the history of the Wallerawang and Lithgow region. This overview contextualises what is listed in the Project Area and its heritage significance.

4.1 Historical Overview

Lithgow Valley's first European settlers arrived in 1824 and the town was named in 1827 by Hamilton Hume, in honour of William Lithgow, Governor Brisbane's private secretary (Leslie, 1988:6). By 1860, only four more families had settled in the valley. When the western railway line was extended to Lithgow in 1869 the town began to thrive (Leslie 1988:20).

Construction of a railway line into the Lithgow Valley began in 1866. When it was completed in 1869, the Zig Zag Railway was acclaimed as a major engineering feat. (Leslie 1988:19). Furthermore, it enabled the industrialisation of Lithgow by making the exportation of coal commercially viable. Thomas Brown commenced Lithgow's first commercial coal mine (Leslie 1988:21). Brown commenced the first commercial coalmine the year the railway arrived.

Lithgow was declared a city in 1945. By that time much of the heavy industry was gone, although light industry continued to prosper and the population peaked in the years just after World War II (Leslie 1988:22).

4.1.1 Coal Mining in the Lithgow District

In 1838, Andrew Brown of "Cooerwull" wrote in his diary 'getting coal' (Cremin and Jack 1987:3). This is the first written record of coal in the Lithgow Valley. In 1868, the construction of the railway line through the Valley spread workmen who built their campsites close to the cuttings, embankments and viaducts throughout the length of the valley. To supply their needs for cooking fires and for heating during the cold winter, a Mr. Poole in 1868 opened the Hermitage Colliery as the first commercial mine to engage in mining and selling coal. By 1874, there were four mines producing - Eskbank Colliery (at the eastern end of Main Street near the present Hoskins Church), the Lithgow Valley Colliery, Vale of Clywdd Colliery and the Hermitage Colliery. The owners of the Lithgow Valley Colliery secured contracts to supply coal to the Railways to run their locomotives.

4.1.2 Coal Measures of NSW in 1908 Source; Carne, J. Geological Survey of NSW, 1908. Wallerawang District Collieries

The nature of coal as a high volume resource necessitates that it is able to be delivered in bulk or to be located near to established transport infrastructure. In NSW, especially in the Western Coalfields region, it meant that railway networks needed to be developed. The failure of several coal mines in the Cullen Bullen region prior to the development of the Wallerawang-Mudgee railway line is testament to the importance of developing bulk haulage networks for coal (Christison 2003:7).

The railway reached Wallerawang in 1870. The Cobb and Co Coach Service provided transport between the station at Wallerawang and Bathurst and Mudgee, using the route approximating the current Castlereagh Highway. The exploitation of coal reserves began in Wallerawang around 1873 with a number of mines being opened on the Lithgow seam at Mount Piper, mid-way between Wallerawang and Lidsdale. Completion of the Wallerawang – Mudgee railway branch line in the 1880s coincided with the rapid growth of the coal mining industry in the Western Coalfields. The Lithgow coal seam outcropping was variable in nature between Lidsdale and Portland where it was predominantly expressed in clay shales. The seam became workable once again at Irondale (Carne 1908:201). The mines in the Wallerawang district generally followed the railway line and included Irondale Colliery (1883), Ivanhoe Colliery (1893) and the

Commonwealth Colliery (1895), which became the first open cut mine in NSW during World War II (1940). In addition were the Cullen Bullen and Invincible coal mines nearby. The Lithgow coal seam quality was best in its lowest portions, which at Cullen Bullen exhibited an average thickness of four feet, but at both Irondale and Ivanhoe had little more than one foot that was workable (Carne 1908:201).

The accessibility of the Lithgow coal seam at various localities in the region dictated that mines and mining communities developed in close proximity to one another. The best example is at Lithgow, where colliery headworks were located within 100-200 metres of one another (Christison 2003:9). Generally speaking, coal mines between the years 1831-1946 were worked using manual labour using a large number of workers mostly employed on contract or piecework arrangements. Miners normally would walk, ride a horse or push bike to their work place and were expected to provide their own mining tools and equipment (Christison 2003:29).

4.1.3 Oil Shale Mining in the Region

The first shale oil deposits in NSW were discovered in 1815, and full-scale mining in the area had begun within the next decade. During the 1860s and 1870s, production was at its peak at the Mount Kembla, Joadja, Katoomba, and Hartley Vale mines. Gradually, however, production at these older mines waned, and by the 1890s mine lease holders were actively seeking alternate mining sites. Rich coal seams were identified near Capertee, and in 1896 the mining leases at Genowlan and Airly Mountains were acquired by the Australian Kerosene Oil and Mineral Company (of the Joadja and Katoomba mines) and the Hartley Vale Company (NSW Shale and Oil Company) (Mills 1998: 9).

The Airly mine was renamed by the Hartley Vale Company as the 'New Hartley Shale Mine'. Shale from this area required more complex processing than the shale that had been extracted from the old Hartley Vale mine. Consequently, a new retort design was developed and plans to construct the Torbane Retort Complex and an associated private railway were underway by 1898.

In 1913, following several tumultuous years of poor export demand, multiple strikes, disputes between the management and mine workers, and a steady decline in the supply of shale and mine productivity, the New Hartley Shale Mine and Torbane Retort Complex were shut down. In the early 1920s, salvageable items from the mine were removed and relocated to more productive mines at nearby Newnes.

The Newnes mine, located in a remote area of the Wolgan Valley, was established in 1906 and provided a readily accessible source of shale. After an initial investment of \$800 into the development of these mines by Sir George Newnes of the Commonwealth Oil Corporation, the mines and the town of Newnes flourished, with the mines producing almost 70,000 tonnes of shale per year by 1912. Operations were suspended in 1912 due to increasing financial difficulties, and ownership of the mines was taken up by John Fell and Company. Production was revived, and continued successfully under Fell until the early 1920s. At this time, shale mining in the area decreased dramatically due to the high cost of shale production and continuing labour problems (Mills 1998: 9). Firebricks from the Newnes mines were relocated to the Clyde Refinery at Duck Creek, and the retorts and engines were moved to the Glen Davis mine in 1939 (Mills 1998: 10).

4.1.4 Newnes

The township of Newnes was established in association with the commencement of mining in the area. During the early operational years of the Commonwealth Oil Corporation, the population of Newnes grew rapidly and numbered just over 1600 in 1911.

As the production of the mines increased in the first decade of the 1900s, a major period of development and construction occurred at Newnes. 1907 was a particularly busy year, and saw the construction of a general

store, newsagency, hairdressing salon, school, two butcher shops, a livery stable, a hop saloon, a billiard hall, a primary school and the local police station and post office (Taylor 1987:30-31).

With the liquidation of the Commonwealth Oil Company, the population of Newnes decreased dramatically; only around 200 citizens remained by 1914. A population revival occurred following the outbreak of World War I and the oil works were re-opened, but this was short lived; the town declined again following the cessation of mining operations in 1923, and by 1926 most of the mine workers and their families had left the area. The town's telephone services were removed in 1928, and the train service was discontinued in 1926 (Taylor 1987: 43).

During the 1930s and depression years, the Newnes township was largely dismantled for re-erection in nearby communities including Rylstone, Kandos and Lithgow. Mining operations ended permanently by 1939 and in the 1950s and 60s, the structural remnants of the Newnes Township were demolished.

4.2 Analysis of Physical and Documentary Research

A number of searches were undertaken of both State and Federal heritage databases to confirm if there were any known heritage items that may be affected by the proposed works.

4.2.1 World Heritage List

A search of the World Heritage List was undertaken. There are no world heritage items in the Study Area; however, although outside of the Study Area, the Greater Blue Mountains is listed on the World Heritage register.

4.2.2 Commonwealth Heritage List

The Commonwealth Heritage List is a list of natural, Indigenous and historic heritage places owned or controlled by the Australian Government. These include places connected to defence, communications, customs and other government activities that also reflect Australia's development as a nation. A search of the Commonwealth Heritage List indicated that there are no items listed in the Study Area.

4.2.3 NSW State Heritage Register

The NSW State Heritage Register contains listings for heritage items of state significance. There are no items of state heritage significance in the Study Area.

4.2.4 Lithgow Local Environmental Plan Heritage

Items of significance at the local government level are included in the Local Environmental Plan (LEP) as Heritage Schedules. These are a list of European and some Aboriginal items that are listed with a council as having heritage value.

4.2.4.1 The Cottage – Item I191 on Lot 101, DP829410 Castlereagh Highway

A search of the Lithgow LEP 2014 Schedule 5 has indicated that the Study Area overlaps a small portion of the curtilage of a historic heritage item listed on the Lithgow LEP Item I191 "The Cottage" which is on Lot 101, DP829410 Castlereagh Highway) (**Table 5**). The heritage buildings associated with this item are located approximately 200 metres east of the Study Area. The Study Area encapsulates a 10 metre x 10 metre section of the curtilage.

Table 5 Heritage Item on the Lithgow Local Environmental Plan 2014

Name of Item	Address	Suburb	Heritage Significance	Item Number
The Cottage	Lot 101, DP 829410, Castlereagh Highway	Lidsdale	Local	I191

4.3 Unlisted Heritage Items

One European Surveyor's Tree abuts the Study Area (**Table 6**) used as a surveying marker. The tree is marked with two blazes.

Table 6 Heritage Item - Unlisted

Name	Type	Zone 56 GDA Easting	Zone 56 GDA Northing
ES JN1	European Surveyor's Tree with two blazes	224430	6304465

4.4 Summary

The Study Area extends 10 metres into the heritage curtilage of "The Cottage," but does not extend to the built heritage items. There is one European Surveyor's Tree (EST JN1) which abuts the Project Area.

5.0 Environmental Context

An understanding of environmental context is important for the predictive modelling and interpretation of Aboriginal sites. The local environment provided natural resources for Aboriginal people, such as stone (for manufacturing stone tools), food and medicines, wood and bark (for implements such as shields, spears, canoes, bowls, shelters, amongst others), as well as areas for camping and other activities. The nature of Aboriginal occupation and resource procurement is inextricably linked to the local environment and, therefore, needs to be considered as part of the cultural heritage assessment process. A summary of the environmental context needs to be undertaken as per the guidelines (DECCW 2010:8&9; OEH 2011:5).

The majority of the Study Area incorporating the water treatment plant and associated infrastructure at MPPS, the new licensed discharge point (LDP) in the vicinity of the existing LDP006, the tailings dams and residual transfer pipeline, the pipeline corridor alongside the overland conveyor, the Gravity Tank Compound and the Existing Water Transfer Pipeline (**Figure 1**) areas are extremely modified. There are some areas of natural vegetation with the potential for intact soils in the area directly to the east of the existing conveyor belt, and in the eastern portion of the Study Area in the valley below the Newnes Plateau and atop the Newnes Plateau. Walking trails, logging routes and access tracks along the northern route have also been subject to moderate to high levels of disturbance. There are some areas that have not been previously cleared but the majority of the Study Area is in a highly disturbed context. It is considered unlikely that there will be extensive areas with intact A horizon soils. If subsurface artefacts are present; it is anticipated that they would be restricted to topsoil layers with sufficient depth (10 to 30 cm) and that they would not be present in clay layers. Generally soils in these areas are highly disturbed with little evidence of intact A horizon soils and therefore little likelihood of *in situ* deposit. The eastern part of the Study Area extends up a steep sided valley to the Newnes Plateau above. Due to water runoff and the nature of the steep terrain, there are no areas within the disturbance footprint for the Study Area that are likely to exhibit features that are indicative of a Potential Archaeological Deposit (PAD) or *in situ* deposit. The valley floor is subject to the effects of inundation and flooding, the cliff sides are precipitous and no rockshelters have been previously identified in this area.

5.1 Local Environment

Aboriginal people often made stone tools using siliceous, metamorphic or igneous rocks and, therefore, understanding the local geology can provide important information regarding resources in a study area. The nature of stone exploitation by Aboriginal people depends on the characteristics of the source, for example whether it outcrops on the surface (a primary source), or whether it occurs as gravels (a secondary source) (Doelman, Torrence et al. 2008).

5.1.1 Geology and Soils

The Study Area extends from Mount Piper Power Station near Blackmans Flat in the west to the Newnes Plateau in the east in the Blue Mountains. The Newnes Plateau surface is gently to moderately inclined and is covered by friable Narrabeen Group sandstones and pagoda rock formations on the plateau margins. Vertical sandstone cliffs descend from the edge of the plateau in the eastern part of the Project Area. The western part of the Study Area is characterised by gently undulating to rolling hills on the Permian and Devonian sedimentary sequences and minor Carboniferous granites (King 1993: 2-3). Much of the Study Area is in disturbed terrain.

The geology for the Study Area is primarily an undifferentiated mix of sandstone, shale and tuff, formed from the Clifton Subgroup of the Narrabeen Group, laid down in the Triassic period characterised by undifferentiated sandstone, shale and tuff. This is bounded by nearby deposits of the Illawarra Coal

Measures (Pi) laid down in the Permian period, comprising shale, sandstone, conglomerate and chert, with coal and seams of torbanite and a quaternary alluvium of gravel, sand, silt and clay, found mainly along watercourses (Bryan, McElroy et al. 1966). The presence of sandstone in the Study Area is an important in owing to its necessity in the manufacture and maintenance of stone tools. Rockshelters may be suitable for occupation and can provide for protection from adverse weather. Flat lying fine-grained sandstone near to a water source can be useful sharpening stone artefacts or may be used for grinding ochre or seeds.

Soil landscapes in the Study Area are described in King 1993 (King 1993). A variety of soil types dominate the landscape (King 1993):

- Disturbed Terrain (xxz) is characterised by land that has been disturbed by human activity to a depth of at least 100cm. This is evident in the western part of the Study Area at the Mt Piper Power Station in the area of the proposed WTP site and across much of the central part of the pipeline route;
- Hassans Walls colluvial soil landscape (hwz) is characterised by cliffs derived from the Narrabeen Group sandstones and steep colluvial talus sideslopes developed over the Permian Illawarra Coal Measures and the Shoalhaven Group with a local relief of >100m. This soil landscape occurs in the western extent close to MPPS, in the central part of the Study Area and in the valley where the northern and southern alternative routes meet in the eastern part of the Study Area. These stony and sandy soils are generally shallow to moderately deep;
- Lithgow residual soil landscape (liz) has flat to undulating rises and broad valley floors on the Permian Illawarra Coal Measures and the Berry Formation and occurs in the western and central parts of the Study Area and is characterised by shallow topsoils. Topsoils (li1, li2, li3) in this landscape are generally 0-30cm in depth and then transition to clay subsoils from 30cm (li4). Topsoils (li1: 0-11cm) comprise dull yellowish brown sandy clay loam; dark reddish brown clay loam (li2: 0-10cm) and/or hardsetting bleached massive fine sandy clay loam (li3: 0-30cm);
- Cullen Bullen erosional soil landscape (cbz) is the dominant soil landscape in the western and central part of the Study Area characterised by shallow to moderately deep topsoils in rolling hills and rises on Illawarra Coal Measures and the Berry Formation. Topsoils (cb1 and cb2) in this landscape are generally up to 50cm in depth and then transition to clay subsoils (cb3). Topsoils comprise dark reddish brown sandy clay loam (cb1: 0-21cm) and are underlain by hardsetting bleached massive fine sandy clay loam (cb2: 21-50cm);
- Pipers Flat alluvial landscape (pfz) has high watertables and seasonal waterlogging and occurs in level to very gently undulating drainage depressions and floodplains on recent alluvium overlying the Berry Formation and Illawarra Coal Measures. Soils are moderately deep to deep (>100cm) and this soil landscape only occurs in a small part of the central part of the Study Area;
- Long Swamp soil landscape (lsz) is characterised by level to very gently inclined closed sedgeland and closed heath with open forest on swamp margins that occur on recent alluvium overlying the Permian Illawarra Coal Measures. Soils are moderately deep (>100cm). This soil landscape is evident at the junction of the northern and southern alternative route options;
- The Wollangambe erosional soil landscape is characterised by the erosive action of running water with localised rock outcrops, broken scarps and small rock ledges and cliffs which occur at the edges of the swamps, with shallow soils on crests (<30cm), moderately deep soils on slopes (<100cm) and shallow sands over rock and occurs alongside the valley along the southern alternative route in the south of the Study Area;
- The Medlow Bath (mbz) residual soil landscape occurs on the narrow crests and inclined sideslopes on the Narrabeen Group sandstones and is characterised by localised rock outcrops with shallow (<40cm deep) organic rich sands over bedrock, earthy well drained sands (<80cm) on crestal ridges and moderately deep yellow earths and earth sands on side slopes;
- Newnes Plateau soil landscape (npz) in the eastern part of the Study Area is characterised by level to

gently undulating wide crests and ridges on plateau surfaces of Triassic Grose Sandstone at elevations generally of >1000m with some rock outcrop; soils are shallow (<50cm deep) on rocky crests; moderately deep (up to 150cm) on inclined sideslopes and in association with shale/ironstone lenses; and deep (>200cm) on deeply weathered friable sandstone;

- The Deanes Creek Swamp soil landscape (dcza) is characterised by narrow gently inclined elongated swamps of closed heath and sedgeland with waterlogged humic gleys and sandstone bedrock; soils are generally shallow comprising sandy loam and clay loams and the hard setting bleached sandy loam. Angular blocky clay is the dominant subsoil, which is characterised by a reddish-brown to bright yellowish-brown colour. Texturally, the subsoil is clayey and forms massive angular blocks when wet. Soil fertility can be low whilst the hard-setting topsoil restricts deep root penetration and in terms of shrink-swell capacity, the shrinkage can reach depths of up to 35 cm.

If subsurface artefacts are present, it is anticipated that they would be restricted to topsoil layers with sufficient depth (10 to 30cm) and that they would not be present in clay layers. The effects of water erosion removing topsoils may mean that there is a low potential for subsurface *in situ* material to be present.

5.1.2 Topography and Hydrology

The purpose of the following summary is to provide an indication of drinkable water which may have been available to Aboriginal people in the past. It does not replace more detailed surface water and groundwater studies. The hydrology of the Study Area incorporates the Wangcol Creek and Coxs River catchments. These high order watercourses and their tributaries traverse the area that would have been accessible as drinkable water for Aboriginal groups moving through the area. As such, there was enough water in the area to sustain at least seasonal habitation and these resource zones were probably large enough to provide reliable water for most of the year.

The landscape in this region ranges from flat to gently inclined rises and broad valley floors in the western part of the Study Area. There are steep sided cliffs in the eastern part of the Study Area before the Study Area ascends to the gently to moderately inclined Newnes Plateau in the eastern part of the Study Area (King 1993).

Due to water runoff from rainfall, topsoils in the area may be affected by sheet erosion washing A horizon soils down slope thereby exposing the clayey B horizon. Thus, where B Horizon soils are exposed, they are generally severely eroded and have been affected by water runoff and sheet wash erosion. The presence of potential stratified archaeological material is possible in areas where A horizon soils occur in undisturbed landscapes. A horizon soils can also be re-deposited on a previously eroded B horizon. Artefacts may occur *in situ* within A horizon soils or atop the exposed B Horizon.

5.1.3 Flora and Fauna

The purpose of the following summary is to provide an indication of the types of flora and fauna which may have been available to Aboriginal people in the past for sustenance and raw material resources; it does not replace more detailed ecological studies.

The vegetation communities in the Study Area are likely to have provided habitat for a variety of animals and which could be potential food and raw material sources for Aboriginal people. Typical animals that could have been hunted by Aboriginal people include kangaroos, wallabies, sugar gliders, possums, echidnas, a variety of lizards and snakes, birds, as well as rats and mice. The bones of such animals have been recovered from excavations of Aboriginal sites suggesting that they were sources of food (Attenbrow 2003:70-76), although the hides, bones and teeth of some of the larger mammals may have been used for Aboriginal clothing, ornamentation, or other implements.

5.1.4 Climate

Approximately 18,000 years ago climatic conditions began to change, affecting the movement and behaviour of past human populations in their environments. During this time, notably at the start of the Holocene (11,477 years ago), the melting of the ice sheets in the Northern Hemisphere and Antarctica caused sea levels to rise, with a corresponding increase in rainfall and temperature. The change in climatic conditions reached its peak about 6,000 years ago (Short 2000:19-21; Lambeck, Yokoyama et al. 2002). Up until 1,500 years ago, temperatures decreased slightly before stabilising, about 1,000 years ago, at a point similar to the temperature currently experienced. Consequently, the climate in the locality of the Study Area for the past 1,000 years would likely have been similar to the present day, providing a year round habitable environment.

According to the Bureau of Meteorology (2012) from the weather station at Lidsdale the region generally experiences greater rainfall in January with a mean average of 108.5 mm, while the month of July is driest with a mean average of 52.2 mm recorded between 1938 -1978. The temperature in this region generally remains moderate to cool throughout the year. The highest temperature generally occurs in January where a mean average of 24.6°C has been documented. During the month of July, the Study Area experiences a cold temperature change which can drop below 0°C.

5.1.5 Synthesis

The majority of the Study Area for the Springvale Water Treatment Project is extremely modified with high levels of ground surface disturbance although there are some areas that have not been cleared. Natural vegetation with the potential for intact soils in the area lie directly to the east of the existing conveyor belt, and in the eastern portion of the Study Area in the valley below the Newnes Plateau and atop the Newnes Plateau. Walking trails, logging routes and access tracks along the northern route have also been subject to disturbance. It is considered unlikely that there will be extensive areas with intact A horizon soils. If subsurface artefacts are present, it is anticipated that they would be restricted to topsoil layers with sufficient depth (10 to 30 cm) and that they would not be present in clay layers.

Soils in these areas are highly disturbed with little evidence of intact A horizon soils and therefore little likelihood of *in situ* deposit. The eastern part of the Study Area extends up a steep sided valley to the Newnes Plateau above. Due to water runoff and the nature of the steep terrain, there were no areas identified within the disturbance footprint for the Study Area that exhibited features that were indicative of a Potential Archaeological Deposit (PAD) or *in situ* deposit. The valley floor showed evidence of inundation and flooding and the cliff sides were precipitous and there were sheer sided rock faces with no overhangs or crevices. The Newnes Plateau above also contained no areas within the footprint of the Study Area that exhibited the features for a PAD.

The presence of sandstone in the Study Area is important as it may provide for suitable shelter for past Aboriginal communities and may have been used in the manufacture and maintenance of stone tools. The available sources of water and the possibilities of shelter in the nearby pagodas and cliff faces in the faces in the eastern part of the Study Area suggest that this part of the Study Area may be suitable for habitation by past Aboriginal communities. None of the rock faces within the Study Area contained rockshelters or grinding grooves. The flora and fauna in the Study Area indicates that there was a rich and diverse range of food and other resources available for exploitation by past Aboriginal communities. The acidity of the soil would appear to preclude the presence of artefacts of organic matter, leaving stone tools as the most likely artefacts to be recorded in the Study Area. However, the soils' susceptibility to water erosion may mean that there is a low potential for subsurface *in situ* material to be present. There are no previously recorded rockshelters or grinding grooves within the Study Area although there are a number of previously recorded stone artefact sites and a scar tree site in proximity to the Study Area.

6.0 Aboriginal Heritage Context

The Aboriginal heritage assessment process requires review of previous archaeological and heritage reports.

6.1 Historic Records of Aboriginal Occupation

It is important that Aboriginal sites are contextualised within the local and regional landscape in order to inform the assessment of significance and to develop a predictive model of Aboriginal sites in the Study Area. Historical information provides further information for the interpretation of archaeological sites.

6.1.1 Ethnography

The ethnographic information used to interpret the archaeological record is often biased and may be deeply prejudiced particularly in relation to lifestyle, social practices, community interactions, religion and other facets of Aboriginal life (L'Oste-Brown, Godwin et al. 1998). It is important to recognise the possible bias when using early European accounts that describe the lifestyles of Aboriginal people, particularly the interpretation of their daily life and beliefs. Nonetheless, some ethnographic records can provide important information and insight on local Aboriginal customs and cultural materials evidenced during the early years of European settlement.

6.1.2 The Traditional Owners and Aboriginal History after European Contact

A number of distinct Aboriginal groups were identified as occupying the Sydney Basin area when the First Fleet arrived in 1788. The Blue Mountains region was home to three large language groups: the Dharug, the Wiradjuri and the Gundungurra. Initial contact between the European settlers and the Dharuk people occurred in 1791 when Phillip's party arrived at the banks of the Hawkesbury and greetings were exchanged with the natives, peacefully sharing their campfire on the river bank at Pitt Town. Tench and Dawes made plans to explore the Blue Mountains and were ferried across the river by Aborigines in bark canoes (Fitzhardinge 1964 cited in Mid Mountains Historical Society 2007).

In 1794, 22 settlers obtained land along the shorelines of the Hawkesbury-Nepean. Within a year there were 546 people occupying the banks of the river which accounted for the main source of the colony's food supply. This area was also an important source of food for the Dharuk people (Mid Mountains Historical Society 2007).

Initially, when white explorers entered the Blue Mountains they did not record any large groups of 'Aborigines' being in residence. Aboriginal presence was noted by Blaxland in 1814 in the valleys where he heard people calling (Gollan 1987). However, an earlier expedition by Barrallier in 1802, who met and observed Aborigines in the Wollondilly Valley, were escorted out of the Blue Mountains by an Aboriginal guide who had knowledge of the tracks leading to the coast. This first contact record and contemporary opinion suggests that the identity of the mountain people adjacent to the Cumberland Plain were the Dharug (Gollan 1987).

Three Frenchmen; Quoy, Gaudichaud and Pellion travelled across the Blue Mountains to Bathurst where they encountered Aborigines in the Springwood area. Pellion made drawings of the natives, including Karadra a sick old man lying on kangaroo skins near a fire and being looked after by a younger man. It was recorded that a local native man was peacefully disposed towards the explorers (Mid Mountains Historical Society 2007).

Windradyne (c.1800-1829), was an Aboriginal resistance leader, he was also known as “Saturday”. Windradyne was a northern Wiradjuri man of the upper Macquarie River region in central-western New South Wales (First Australians ND).

On arrival of the first settlers, Windradyne attempted to peacefully communicate with the European counterparts. Windradyne had Wiradjuri people befriend the new settlers and assist them with areas to camp. However, when the Europeans began to clear the land it became obvious to the Aborigines that their arrival to Australia was not on a temporary basis. The settlers started destroying the environment and places that were sacred to the natives. Windradyne was determined to not let these people destroy local families and their society. After the conflict many of the Wiradjuri surrendered to the British, but Windradyne was able to elude capture, and later in 1824 Windradyne and 130 Wiradjuri warriors walked for 17 days from Bathurst across the Blue Mountains and into the settlement of Paramatta to attend the annual native feast. On arrival to the feast Windradyne had the word peace stuck in his hat (First Australians ND). He was accepted by the British as a result of this encounter.

According to Tindale (1974) the area falls within the limits of the land occupied by the Wiradjuri group. However, due to the location of the Study Area at the foothills of the Blue Mountains, it was often referred to as a zone of interaction between different Aboriginal groups residing in the vicinity of the Study Area, such as the Gundungurra, Wiradjuri and Darung people (Comber 2009). Early records of Aboriginal occupation in the Blue Mountains is quite scarce, largely relying on the few references made to Aboriginal subsistence strategies in the diaries of early settlers in the region.

6.2 Local Archaeological Heritage Context

The local Aboriginal heritage context provides a review of previous archaeological work conducted in the local landscape, determines whether Aboriginal sites have been previously identified (AHIMS search) in the Study Area and informs the predictive model of Aboriginal sites for the area. The review of previous archaeological work includes relevant local research publications and archaeological consultancy reports.

Two types of archaeological investigations are generally undertaken: excavations and surveys. Archaeological excavations can provide high-resolution data regarding specific sites, such as the dates or chronology of Aboriginal occupation and information on stone tool technology (reduction sequences, raw material use, tool production, usewear and retouch). Archaeological surveys generally cover wider areas than excavations and can provide important information on the spatial distribution of sites.

The detection of sites during survey can be influenced by the degree of disturbance or erosion present. As such, sensitivity mapping is sometimes required to interpret survey results. The local Aboriginal heritage context also provides a context for assessing archaeological significance of sites.

6.2.1 Aboriginal Heritage Information Management System (AHIMS)

A search of the AHIMS on 3 May 2016 covering the Study Area (Appendix 2) revealed that there are no Aboriginal sites in the Study Area; however, as discussed below, there are seven extant sites within 30 metres of the Study Area.

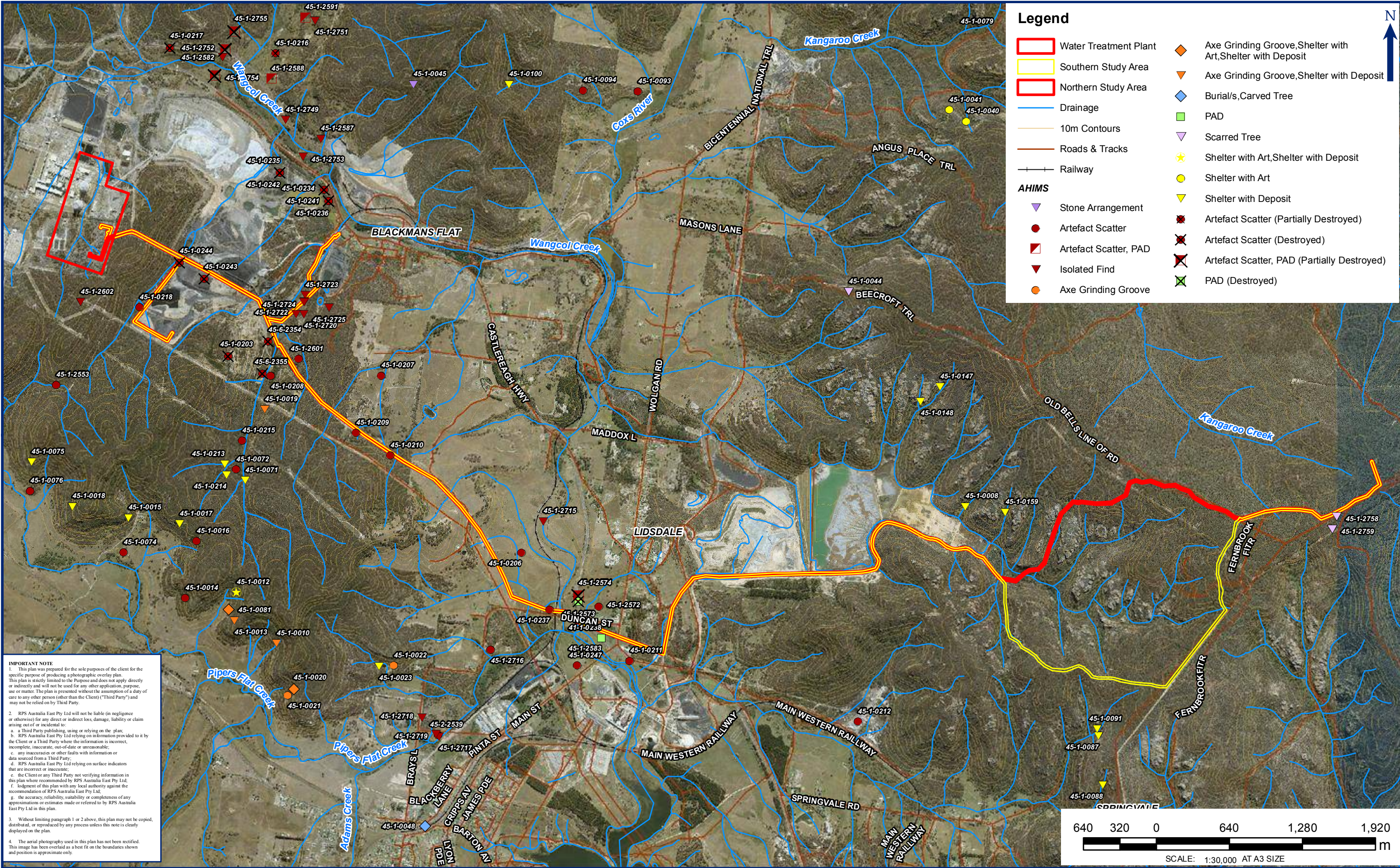
The AHIMS results show 94 previously recorded sites in the local area (after adjustments were made due to errors on the AHIMS database and duplication of recorded sites).

There were 51 artefact sites (artefact scatters and isolated finds) of which 11 were no longer extant and two were partially destroyed; of the six artefact scatters with PAD two were still extant and four had been partially destroyed; and of the three PADs one had been destroyed. Rockshelter sites (n=27) were the second most common site and included rockshelter sites with art, with deposit and with grooves, all of which were extant. There were two grinding groove sites, three scarred tree sites, one stone arrangement and one burial with carved tree site all of which were extant. **Table 7** summarises the frequency of site type with percentages representing occurrence for each site type within the Study Area.

Table 7 Summary of AHIMS Sites within the searched co-ordinates

Site Type	Frequency	Percent
Study Area	(Count)	%
Artefact Scatter	35	37.23
Isolated Finds	16	17.02
Artefact Scatter with PAD	6	6.38
PAD	3	3.20
Rockshelter with Deposit	18	19.15
Rockshelter with Art	2	2.13
Rockshelter with Art and Deposit	1	1.06
Rockshelter with Deposit and Grinding Grooves	4	4.25
Rockshelter with Art, Deposit and Grinding Grooves	2	2.13
Grinding Grooves	2	2.13
Scarred Trees	3	3.20
Burial and Carved Tree	1	1.06
Stone Arrangement	1	1.06
Total Sites within Study Area	94	100

Source: AHIMS Search 3 May 2016



There are 11 Aboriginal sites previously recorded within 30 metres of the Study Area (**Table 8**) of which seven were found to be extant (valid). One of these had only been partially salvaged under a Consent to Salvage Permit (AHIMS Site #45-1-0237). Four of the previously recorded sites had been previously salvaged under Consent to Destroy/ Consent to Salvage Permits issued by the OEH and were no longer valid (**Table 8**).

Table 8 Previously recorded AHIMS Sites within 30 metres of the Study Area

AHIMS Site Number	Name	Zone 56 MGA Easting	Zone 56 MGA Northing	Site Type	Site Type
45-1-0209	S4; Wallerawang	226405	6302740	Artefact Scatter	Not Valid
45-1-0210	S3; Wallerawang	226705	6302540	Artefact Scatter	Valid
45-1-0218	57 Blackmans Flat	224505	6303840	Artefact Scatter	Valid
45-1-0237	Springvale Colliery	228105	6301190	Artefact Scatter	Valid – Partially Salvaged
45-1-0243	S13; Springvale Colliery	224970	6303900	Artefact Scatter	Not Valid
45-1-0244	S13; Springvale Colliery	224855	6304230	Artefact Scatter	Not Valid
45-1-2721	CS SU4 – A4	225953	6303887	Isolated Find	Valid
45-1-2723	CS SU4 – A2	225959	6303943	Isolated Find	Valid
45-1-2724	CS SU4 – A1	225946	6303882	Isolated Find	Valid
45-1-2758	RPS SV ST1	235004	6302002	Scar Tree	Valid
45-6-2354	Lamberts Creek 6	225530	6303350	Artefact Scatter	Not Valid

The results of the AHIMS searches showed that seven sites remained extant within 30 metres of the Study Area **Table 7**. It is important that none of these extant sites are harmed by the proposed development works.

Table 9 Extant sites within 30 metres of the Study Area

AHIMS Site #	Name	Type	Zone 56 GDA Easting	Zone 56 GDA Northing	Site Status
45-1-0210	S3;Wallerawang	Artefact Scatter	226705	6302540	Valid
45-1-0218	57 Blackmans Flat	Artefact Scatter	224505	6303840	Valid
45-1-0237	Springvale Colliery	Artefact Scatter	228105	6301190	Partially Salvaged - Valid
45-1-2721	CS SU4 – A4	Isolated Find	225953	6303887	Valid
45-1-2723	CS SU4 – A2	Isolated Find	225959	6303943	Valid
45-1-2724	CS SU4 – A1	Isolated Find	225946	6303882	Valid
45-1-2758	RPS SV ST1	Scar Tree	235004	6302002	Valid

6.3 Review of Previous Archaeological Studies

Gorecki, P.P (1983) Archaeological Survey Kariwara Colliery Lease, Lithgow NSW.

A field survey was undertaken in January 1983 commissioned by Longworth and McKenzie Pty Limited. The survey was conducted on the Newnes Plateau approximately nine kilometres north of Lithgow in the Newnes State Forest. The survey aimed to locate and establish archaeological significance of Aboriginal relics and provide recommendations regarding protective measures for them. A previous assessment of Gorecki covered an area immediately east of the current Study area. The survey area in the study was divided into four environmental zones based upon geology, topography, vegetation cover and ground cover visibility. The archaeological potential of these zones were assessed. The four zones incorporated: lagoon paddock, valley floors including Sawyers Swamp Creek, Kangaroo Creek and Wolgan River, escarpments and plateaux.

The results of the survey found five archaeological sites and 19 potential occupation sites. Potential occupation sites were overhangs or covered areas which may have been used for shelter in the past, but had no deposit at all. Gorecki also considered that some may have had the potential to contain relics. Common sites found were a combination of shelters with art and deposit consisting of quartz, chert, indurated mudstone, quartzite and fine grained igneous inclusions (Gorecki 1983).

Electricity Commission of New South Wales [McIntyre, S] (1990) Archaeological Survey of the Proposed Kariwara Longwall Coal Mine

Newcom Collieries proposed to construct a new longwall coal mine in the Newnes Plateau in an area abutting the existing Angus Place mine. The aim of the archaeological investigation was to locate all archaeological sites likely to be affected by mine subsidence. The field survey was undertaken over a six week period in 1986. Test excavations were also carried out to determine whether PADs were Aboriginal sites (Electricity Commission of New South Wales 1990).

Rich and Gorman (1992) Proposed Springvale Colliery and Conveyor, Wallerawang: Archaeological Survey for Aboriginal Sites.

An archaeological assessment was conducted for the proposed Springvale Colliery and related facilities located near Wallerawang (Rich and Gorman 1992). The survey was divided into four locations; Springvale Pit Top Area 500m x 350m, Proposed Springvale Longwall Mine Area 7.5km x 5km, Proposed Conveyor Route measuring less than 10m wide and approximately 10km long and the Proposed Washery covering an area of 1km x 500m, including the reject emplacements and dams.

The field survey uncovered 11 artefact scatter sites, an isolated find, two possible site locations, and three shelters with PAD (Potential Archaeological Deposit).

The artefact scatters were generally located on well exposed areas containing several artefacts with dominant raw materials of quartz, quartzite and mudstone. Shelters were predominantly composed of sandstone pagodas which are typical for the regional landscape and commonly located along tributary lines. Two of the shelters contained evidence of rock art. Archaeological test excavations were recommended to be carried out at the two potential site locations.

Rich (1993) Springvale Coal Project, Wallerawang, NSW: Archaeological Inspection of Aboriginal Sites affected by Construction Works.

This report was undertaken by Rich subsequent to the 1992 archaeological assessment undertaken by Rich and Gorman (1992). An assessment was made of existing recorded sites that had been, or were likely to be, affected by development works.

Several recommendations were made additional to those outlined in the 1992 report. These included the updating of existing recorded site cards where necessary (Rich 1993).

Oz Ark (2005) Flora/Fauna and Heritage Assessment: Open Cut Mine Expansion Mining Lease 1448

OzArk was commissioned by Centennial Coal to undertake an archaeological assessment within Mining Lease 1448 as part of an EIS. This area was to the west of Mt Piper Power Station and incorporated a section of the existing conveyor from Mt Piper Power Station through Western Main Colliery Holdings. The conveyor connected to Lidsdale Siding and to Springvale Pit Top. Ozark noted that this area had been surveyed previously by Rich and Gorman (1992) and that archaeological test excavation at two sites had been undertaken by Haglund in 1992 in Lamberts Gully.

The proposed project was an extension to the existing Lamberts Gully Open Cut Coal Mine. The report involved a desk top study of previously recorded sites in the vicinity of the Study Area, which identified that eight Aboriginal sites had previously been recorded within Mining Lease 1448. Of these eight sites, five were open sites, two were initially potential archaeological deposits (PAD) later assessed to be open sites and a single isolated find. The field team attempted to relocate the previously recorded sites with varying degrees of success. The assessment identified three sites that were directly in the area of impact. As a result, it was recommended that the proponent apply to the Director-General of OEH for a Section 90 permit to impact these sites (Ozark 2005).

RPS HSO (2009) Lidsdale Siding Loading Facility Project, Ivanhoe Coal Pty Ltd

In 2009, Centennial Coal engaged RPS (formally RPS HSO) to undertake an archaeological investigation for the proposed upgrade to the Lidsdale Siding loading facility. The field survey was undertaken in two parts: the existing coal loading operations and the existing rail siding. The survey of the existing coal loading operations was undertaken for the purpose of investigating impact to potential Aboriginal and European heritage material items. No evidence of Aboriginal cultural heritage was identified despite excellent visibility. Survey of the rail siding yielded the same result with no Aboriginal cultural material identified.

RPS (2012) Springvale Colliery Aboriginal Archaeological Due Diligence Assessment

RPS was engaged by Springvale Coal Pty Ltd (Springvale) to prepare a Cultural Heritage Due Diligence Assessment for the proposal to drill eight boreholes and associated access tracks in the Newnes State Forest on the Newnes Plateau as part of an ongoing exploration drilling programme by Springvale for testing coal quality in order to refine the existing geological model.

The survey identified two new sites both of which were in close proximity to proposed drilling locations. The report recommended these drilling locations be adjusted to prevent impact to the Aboriginal sites, and that proposed works proceed accordingly.

RPS (2012) Lidsdale Siding Loading Facility Project, Ivanhoe Coal Pty Ltd

RPS was commissioned by Lidsdale Siding, a subsidiary of Centennial Coal (Western Operations) and managed by Ivanhoe Coal Pty Ltd, to prepare a Cultural Heritage Assessment for the proposed upgrade to the existing Lidsdale Siding Rail Loading Facility (automation of the train loading facility) under Part 3A Section 75F Major Projects of the EP&A Act. This CHA report formed part of the Environmental Assessment (EA) for the project.

Areas of archaeological sensitivity pertaining to Aboriginal Heritage were identified in the Study Area. The sites were all confined to clearings created for access tracks. There was one previously recorded site and artefact scatter (# 45-7-0237).

RPS (2013) Angus Place Mine Extension Project Cultural Heritage Impact Assessment

RPS was engaged by Centennial Angus Place to prepare a Cultural Heritage Impact Assessment for the proposed extension of mining operations within the mine's current mining lease as part of the Angus Place Mine Extension Project. The Project Application Area is located in the Lithgow LGA at the Angus Place Pit Top and a large area on Newnes Plateau (LGA).

The overall Project Application Area encompassed four study areas, comprising 29 survey units in total, which covered an area of 5030.5 hectares (ha). The largest of these study areas was located on the Newnes Plateau to the east of the pit top area and contained 21 survey units. The remaining three study areas were smaller, and were partially located in a valley area composed of paddocks and pastoral land to the immediate north (three survey units), south (three survey units), and east (two survey units) of the pit top area.

The objective of the Cultural Heritage Impact Assessment was to identify all archaeological (Aboriginal and historical) sites (potential and actual) within the Project Application Area to formulate mitigation and management strategies necessary for inclusion in an Environmental Impact Statement. It was considered that three sites within the Project Application boundary were at risk of mine subsidence and no sites would be affected by proposed surface works. No new Aboriginal objects or places were identified as part of this investigation.

RPS (2013) Western Coal Services Project, NSW, Cultural Heritage Impact Assessment

RPS was commissioned by Coal Services, a subsidiary of Centennial Coal (Western Operations), to prepare a Cultural Heritage Impact Assessment for the proposed Western Coal Services Project-Blackmans Flat. This Cultural Heritage Impact Assessment was to be integrated into an overall Environmental Impact Statement in support of an application for Development Approval under Division 4.1 of Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act 1979).

The objective of the Cultural Heritage Impact Assessment was to identify all Aboriginal and historical archaeological sites and potential for sites within the lease/licensed areas to formulate mitigation and management strategies necessary for inclusion into an. The Project Application Area was divided into six survey units. Of the 14 previously registered AHIMS sites within the Project Application Area boundary, it was considered that three were at potential risk of harm from mine subsidence and would be managed as part of a monitoring program prescribed with the report. A total of six new Aboriginal sites were recorded during the survey, all of which consisted of isolated finds. A total of ten sites were previously recorded by other cultural heritage consultants – seven had been salvaged under a S90 AHIP leaving three extant sites. No constraints were placed on non-Aboriginal heritage in the local area as the Project Area was well removed from any listed heritage items.

RPS (2013) Springvale Mine Extension NSW, Cultural Heritage Impact Assessment

RPS was engaged by Springvale Coal Pty Limited (Springvale Coal) to prepare a Cultural Heritage Impact Assessment as part of an Environment Impact Statement for the Springvale Mine Extension Project. The Project Application Area was within the Springvale mining lease within the Lithgow LGA. The components of Springvale Mine's existing operations were an underground longwall mine accessed via the Springvale pit top, supporting surface infrastructure within the pit top area, and an area on Newnes Plateau within the Newnes State Forest. It should be noted that this assessment considered the duplication of Springvale Delta Water Transfer Scheme footprint which follows the same alignment to LDP 009.

Targeted site inspections were conducted in 2012 within the Project Application Area. Additional field survey was also conducted in May 2013. The survey area was divided into 36 survey units. Thirty previously registered sites were identified within the Project Application Area and four new sites were identified by RPS during the site survey. Nineteen were inside the Project Application Area and the remaining eleven in the 50 metre boundary just outside it. A further four sites were identified by RPS during the field survey. Of these 34 sites, three were identified as being at risk of being impacted by subsidence. The impact avoidance and minimisation mitigation measures were directed entirely at these three sites. No historic heritage sites were recorded and none were listed in any heritage register inside the Project Application Area. As such no historic heritage items need to be managed for the proposed works.

6.4 Predictive Model

The following predictive model aims to provide testable statements about the nature and distribution of evidence of Aboriginal occupation on the basis of environmental information, as well as the review of relevant archaeological and heritage reports. The predictive model is necessary for the formulation of appropriate field methodologies and to provide information for the assessment of archaeological significance.

According to the AHIMS database search coupled with past Aboriginal heritage assessments conducted in the local region, the most common site types were surface artefact sites, rockshelters, PADs, grinding grooves and scarred trees.

Surface artefact sites and PADs have been identified, primarily, on the valley floors (creek flats, hillocks and lower slopes). This patterning is likely attributable to the higher order water courses available in this landform suite which made it an ideal location for Aboriginal campsites.

Rockshelters and grinding grooves have been identified on ridgelines and slopes. This distribution is influenced by the nature of outcropping sandstone, whereby rockshelters can only be formed on suitably large outcropping sandstone cliffs, boulders, or shelves and grinding grooves require high quality sandstone and a water source (to assist in grinding implements).

Scarred Trees are the remaining evidence of the utilisation of bark, which was commonly used for shields, shelter, various bark containers and sometimes water craft. Ethnographic evidence suggests that bark was a commonly used material by Aboriginal people. However, logging and other land uses by Europeans have removed much of the trees both historically and in more recent times, as such, much of the evidence for scarred trees has been removed. Scarred Trees have been identified infrequently in the local area and where present have been found in remote, difficult to access locations such as ridgelines and slopes.

The Study Area crosses all of the landforms where Aboriginal sites occur. However, the density of Aboriginal sites is not high across the local area, with many of the sites occurring in areas which are difficult to access (as is the case for rockshelters, grinding grooves and scarred trees). The valley floors are also highly disturbed which reduces the likelihood of in-situ artefacts.

Due to the extent of previous archaeological investigations and the extensive disturbance and modifications to the majority of the Study Area: previous ash plant at Mt Piper, installation of previous infrastructure including conveyor belt, conveyor tunnel and bridges, desalination plant, powerlines, access roads and pipelines, it is considered that the likelihood of finding additional Aboriginal sites is very low.

6.5 Summary of the Aboriginal Heritage Context

Many archaeological assessments have been undertaken within the Study Area. Common site types are artefact sites (artefact scatters, isolated finds and PADs), scar trees, stone arrangements, rockshelters in the surround high country and grinding grooves in the creek beds. Due to the pipeline being placed in an existing conveyor belt and pipeline disturbance envelope, high rates of water runoff and extensive modifications within the Study Area, it is considered unlikely that additional sites will be found.

7.0 Aboriginal Heritage Survey and Field Results

7.1 Survey Methodology

The Study Area was surveyed in accordance with the requirements set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010) and the Guide for Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011).

7.1.1 Survey Aims

The purpose of the survey was to inspect visible ground surfaces, observe exposed soil profiles, sample all landform types in the Study Area and record any material evidence for Aboriginal occupation. The survey also aimed to record any cultural sites or Aboriginal landscapes, if identified by the Aboriginal stakeholders.

This heritage assessment has been undertaken in accordance with best practice guidelines for survey reporting and included the following components:

- Documentation of survey coverage;
- Documentation of results; and
- Documentation of significance of sites/areas to the Aboriginal community.
- The survey methodology aimed to provide adequate coverage of the Study Area, sample coverage of all landforms, areas of exposure, as well as, vegetated areas. The locations of previously recorded sites were also inspected.

Each survey area was described, detailing the level of exposure and ground surface visibility. The purpose of describing the survey units is to ensure comparability of results between different areas of the local landscape. Areas with high visibility and exposure generally have high levels of land surface disturbance, which can expose high quantities of archaeological material (particularly stone artefacts). Conversely, areas of low visibility and exposure are generally more intact (undisturbed) landscapes, where the likelihood of identifying sites (particularly artefact scatters) is generally lower. Areas of low visibility however, usually provide a higher potential for locating intact archaeological deposits which have been protected by vegetation coverage.

In accordance with OEH guidelines photographic recording was undertaken of landforms, survey units, Aboriginal cultural material, areas of archaeological or cultural sensitivity, levels of disturbance, as well as, other areas/items of interest. Photographs were scaled, as appropriate.

Field notes incorporated details including the size, location, contents and condition of Aboriginal heritage in the area and survey units. Size was recorded, either by GPS or tape measure. Location was recorded using differential GPS. The conditions of Aboriginal sites/areas of sensitivity were recorded providing detailed descriptions of the levels and cause of disturbances, erosion, land clearing and similar factors.

The Aboriginal stakeholder(s) participating in the survey were asked about the cultural significance of the survey area and where applicable and/or appropriate, about the significance of Aboriginal sites and/or areas of archaeological sensitivity. An opportunity to comment on cultural significance was also provided in the survey preparation documentation and post survey reporting.

7.2 Archaeological Field Survey Results

The Study Area includes previously modified and disturbed areas. Staged survey works have been undertaken since consultation was begun in 2011 and have continued until 2016. Individual survey coverage results can be found in the following reports:

- Lidsdale Siding Project (RPS 2012),
- Western Coal Services Project (RPS 2013),
- Springvale Mine Extension Project (RPS 2013),
- Coal Stockpile Expansion, Springvale (RPS 2016), and
- Booster Station & Borehole to Gravity Tank Electrical Route, Springvale (RPS 2016).

The current Study Area incorporates a highly modified and disturbed landscape: the proposed Water Treatment Plant location at the MPPS site, the Treated Water Pipeline route and the Residuals Transfer Pipeline from the water treatment plant to the new licensed discharge point and the reject emplacement area within the Springvale Coal Services Site, existing southern pipeline route, specifically the DN450 section, the existing above-ground pipelines from LDP009 to Skelly Road in the vicinity of the now decommissioned Wallerawang Power Station, the pipeline route along the overland conveyor from Skelly Road all the way to MPPS and the Gravity Tank Compound on Newnes Plateau.

Natural vegetation does occur in a part of the Study Area. This vegetation occurs in the eastern part of both alternative routes (the Northern and the Southern Study Areas) extending across the escarpment onto the Newnes Plateau.

7.2.1 Mt Piper Power Station

The proposed Water Treatment Plant location and the previous stockpile and laydown area at MPPS were extremely modified with numerous tracks covered by imported fill, concrete hardstand area, drainage culverts, cyclone fencing and part of the conveyor system (Plate 1 to Plate 4). There were banded with some regrowth vegetation evident but with no mature trees present. Cyclone fencing surrounds the area with access via locked gates and tracks covered with imported gravels. Some areas were landscaped and grassed. There was a large concrete culvert system with metal bridges crossing the culverts across much of this part of the Study Area. A conveyor belt was located on the eastern side of the survey unit and there are stockpiles of gravel and soil nearby. Ground surface visibility (GSV) was 75% and ground surface exposure (GSE) was 80%.

▲ No Aboriginal cultural material or items of historical significance occur in this area.

7.2.2 Vegetated Area and Footprint adjacent to the European Surveyor's Tree ESJN1

This area, located within the central portion of the Study Area, was predominantly natural or regrowth vegetation although there were dilapidated wire fences, access tracks and felled trees in this area. This included a vegetated area between the MPPS and vegetated area adjacent to the coal conveyor belt in the western part of this area (Plate 5 & Plate 6). Soils were predominantly A and B horizon soils in the undisturbed areas, and exposed B horizon in the disturbed areas along access tracks, fencelines, conveyor belt and cleared areas. Ground surface visibility (GSV) was 70% and ground surface exposure (GSE) was 50%.

Mature trees in this area were inspected and a European Surveyor's Tree ESJN1 was identified. The tree had two blazes on the southern face of the tree (Plate 7 to Plate 10). No Aboriginal Scarred Trees or other

sites were identified. The European Surveyor's Tree, EST JN1, was identified within 30 metres of the Study Area (**Table 10**) close to an access track. The area was heavily modified (Plate 11 to Plate 14). The area around the tree will be marked as a NO GO ZONE during ground surface disturbance works to prevent harm to the tree.

Table 10 European Surveyor's Tree

Name	Type	Zone 56 GDA Easting	Zone 56 GDA Northing
EST JN1	European Surveyor's Tree	224430	6304465

▲ No Aboriginal cultural material or items were identified in this area; one European Surveyor's Tree (EST JN1) was identified and a NO GO ZONE area will be clearly marked around the tree to prevent harm to the tree.

7.2.3 Residuals Transfer Pipeline and Treated Water Discharge Pipeline

This section of the Springvale Water Pipeline was initially surveyed as part of the Western Services Coal Project (RPS 2013b). Additional due diligence visual inspection of the amended disturbance footprint for the residuals transfer pipeline and treated water discharge pipeline was undertaken by RPS in May 2016. This part of the Study Area extended across Castlereagh Highway to the north of LDP006 to a newly proposed licensed discharge point. Several previously recorded sites are extant in proximity to the Study Area but none within the proposed disturbance footprint for the infrastructure in this area. There were no areas of natural vegetation evident in the footprint for the residuals transfer pipeline or treated water discharge pipeline sections and the area was heavily modified. The areas around the artefact sites will be marked as NO GO ZONE areas during ground surface disturbance works. GSV was 90% and GSE 90%.

A number of previously recorded AHIMS Sites remain extant: #45-1-0218, #45-1-2721, #45-1-2723 and #45-1-2724 and were found to be within 30 metres of the Study Area but none of the sites occur within the disturbance footprint of the Study Area.

Previously recorded sites AHIMS #45-1-0243, #45-1-0244 and #45-6-2354 were no longer extant. The sites were re-inspected to ensure that no further artefacts remained at this site. No artefacts were present at these and the sites are therefore not valid.

▲ Four extant AHIMS Sites #45-1-0218, #45-1-2721, #45-1-2723 and #45-1-2724 were within 30 metres of the disturbance footprint. NO GO ZONE areas will be clearly marked around the artefact sites to prevent harm to the artefacts at the sites.

7.2.4 Existing Overland Conveyor Footprint

There were no areas of natural vegetation evident in that portion of the Study Area that included the overland conveyor. There were extensive sections of cleared land and some areas with regrowth planting evident. The area is highly modified (Plate 15 to Plate 27). Part of the conveyor is underground in a tunnel in the Duncan Road to Wolgan Road area (Plate 28 & Plate 29). The pipeline alignment then passes between Wolgan Road and Skellys Road before passing uphill towards the area known as LDP009. GSV was 80% and GSE 85%.

There were three previously recorded Aboriginal sites, AHIMS #45-1-0209, #45-1-0210 and #45-1-0237 close to the disturbance footprint for the proposed pipeline. According to the AHIMS database, AHIMS #45-1-0209 was located underneath the existing conveyor belt. This site area was inspected and no artefacts were identified. It is considered that this is no longer a site and should be deregistered. The areas around the artefact sites will be marked as NO GO ZONE areas during ground surface disturbance works.

The curtilage of “The Cottage” (I191) a historic heritage listed item extends into the Study Area; however the heritage buildings associated with this item are located approximately 200 metres east of the Study Area. The Study Area encapsulates a 10 x 10 metre section of the western part of the curtilage. The proposed works will have minor visual impact on this heritage item, but will not impact any built heritage and thus satisfies Section 121S (2) of the EP&A Act. Works should be limited to the 10 metre x 10 metre area identified.

▲ Three extant AHIMS Sites #45-1-0209, #45-1-0210 and #45-1-0237 were within 30 metres of the disturbance footprint. NO GO ZONE areas will be clearly marked around the artefact sites to prevent harm to the artefacts at the sites.

7.2.5 Pipeline

An area to the east Skellys Road covering the mid sloped portion of the pipeline had been surveyed previously. This area was re-inspected and the pipeline and defined track were cleared of vegetation and well maintained (Plate 30 to 36). The pipeline and access track measuring approximately 15 metres in width is flanked by open woodland vegetation with an understorey of shrubs and leaf litter. Ground surface visibility on either side of the pipeline and track was deemed low (≈5% - 20%) with visibility increasing to approximately 90% on the exposed track. This area is highly modified with no remnant vegetation and the clay B horizon evident within the disturbance footprint. GSV was 90% and GSE 90%. This portion of the pipeline footprint is set on a moderate gradient (≈30 degrees), gradually becoming steeper toward the top of the hill. Some sections had been paved with concrete and formed part of existing drainage culverts. An electrical pump station is located on the hill toward the most westerly portion of the pipeline route. The area also showed signs of extensive disturbance with road side litter, bitumen fragments and rubbish dumping and access for the nearby desalination and revegetation area.

▲ No Aboriginal cultural material or items of historical significance were identified within the proposed disturbance footprint for this part of the Study Area.

7.2.6 Alternative Southern Pipeline Route

The Southern Study area incorporated a 750 metre stretch of track located within the Newnes Plateau above the cliffline. A large proportion of this area (Beecroft Track) had been previously inspected for archaeological objects during the Springvale Extension of Mine Project. The track has been well maintained and is flanked on either side by juvenile and mature eucalyptus sp. trees with an understorey of shrubs and leaf litter. Ground surface visibility along the length of the east-west trending route was excellent (≈80%), and was used for vehicle access. The unnamed track extension that trended south of Beecroft Track offered higher surface visibility (≈60%) and was devoid of vegetation regrowth. GSV was 50% and GSE 35%. Cliffclines were inspected for evidence of rockshelters but none were found (Plate 37 to 42). The valley below the cliffline was predominantly natural or regrowth vegetation in areas where the access tracks, power line or pipelines were evident. There were formed drainage channels and numerous felled trees in this area in the lower slopes. There was evidence of inundation and uprooted trees in the drainage line. Mature trees in this area were inspected but no culturally modified trees were identified. Soils were predominantly A and B horizon soils in the undisturbed areas and exposed B horizon in the disturbed areas along access tracks and in cleared areas.

▲ No Aboriginal cultural material or items of historical significance were identified within the proposed disturbance footprint for this part of the Study Area.

7.2.7 Alternative Northern Pipeline Route

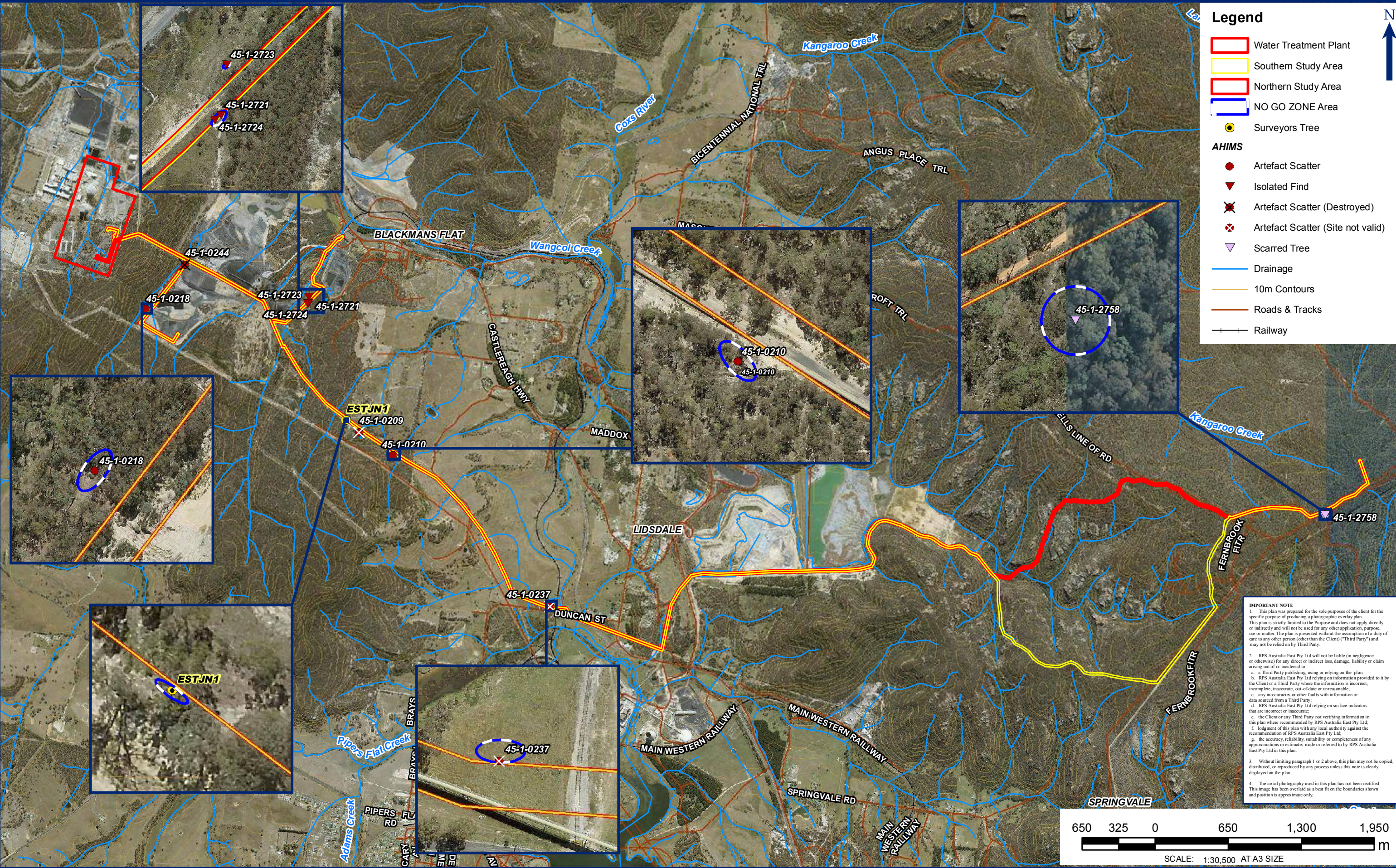
This area was predominantly natural or regrowth vegetation although there were formed drainage channels access tracks and numerous felled trees in this area. There was evidence of inundation and uprooted trees in the drainage line. Soils were predominantly A and B horizon soils in the undisturbed areas and exposed B horizon in the disturbed areas along access tracks and in cleared areas (Plate 43 to 48). GSV was 50% and GSE 35%. The unnamed track extension north of Beecroft Track offered lower GSV ($\approx 20\%$) as it had been unused for a period of time and vegetation rejuvenation had taken place. Mature trees in this area were inspected but no culturally modified trees were identified. No other sites were identified.

▲ No Aboriginal cultural material or items of historical significance were identified within the proposed disturbance footprint for this part of the Study Area.

7.2.8 Gravity Tank Compound

The Gravity Tank Compound was adjacent to the Beecroft Track and was cleared of vegetation. The surrounding area is flanked on either side by juvenile and mature eucalyptus sp. trees with an understorey of shrubs and leaf litter. Ground surface visibility along the length of the east-west trending route was excellent ($\approx 80\%$), and was used for vehicle access. This area was is predominantly natural or regrowth vegetation although there were formed drainage channels access tracks and numerous felled trees in this area. Soils were predominantly A and B horizon soils in the undisturbed areas and exposed B horizon in the disturbed areas at the Gravity Tank Compound. GSV was 30% and GSE 35%. There was evidence of inundation and uprooted trees in the drainage line. Mature trees in this area were inspected but no culturally modified trees were identified. No other sites were identified.

▲ No Aboriginal cultural material or items of historical significance were identified within the proposed disturbance footprint for this part of the Study Area. However there was scar tree #45-1-2758, located approximately 28 metres from the Study Area boundary, and not within the disturbance footprint.



TITLE : FIGURE 6: NO GO ZONE AREAS AROUND ABORIGINAL AND HISTORIC HERITAGE SITES	LOCATION : SPRINGVALE	DATUM:GDA 1994	DATE : 15/08/2016	VERSION (PLAN BY): BA3 (Natalie.Wood)
		PROJECTION: GDA 1994 MGA Zone 56	PURPOSE: HERITAGE	PATH: J:\JOBS\Centennial\All Jobs\131758 JV Energy Australia Springvale\10 - Drafting\Arcgis Map Documents\Arch\Report Figures\131758 Figure 6 NGZ B A3 20160812.mxd

7.3 Summary

There were no new Aboriginal sites identified during the survey. There were eleven previously recorded sites of which four are no longer extant (**Table 11**).

Table 11 Previously recorded sites in vicinity of Study Area.

AHIMS Site Number		Zone 56 MGA Easting	Zone 56 MGA Northing	Site Type	Site Type	Survey Area
45-1-0209	S4; Wallerawang	226405	6302740	Artefact Scatter	Not Valid	Overland Conveyor
45-1-0210	S3; Wallerawang	226705	6302540	Artefact Scatter	Valid	Overland Conveyor
45-1-0218	57 Blackmans Flat	224505	6303840	Artefact Scatter	Valid	Residuals Transfer Pipeline
45-1-0237	Springvale Colliery	228105	6301190	Artefact Scatter	Valid – Partially Salvaged	Overland Conveyor
45-1-0243	S13; Springvale Colliery	224970	6303900	Artefact Scatter	Not Valid	Overland Conveyor
45-1-0244	S13; Springvale Colliery	224855	6304230	Artefact Scatter	Not Valid	Overland Conveyor
45-1-2721	CS SU4 – A4	225953	6303887	Isolated Find	Valid	New Treated Water Pipeline
45-1-2723	CS SU4 – A2	225959	6303943	Isolated Find	Valid	New Treated Water Pipeline
45-1-2724	CS SU4 – A1	225946	6303882	Isolated Find	Valid	New Treated Water Pipeline
45-1-2758	RPS SV ST1	235004	6302002	Scar Tree	Valid	Newnes Plateau
45-6-2354	Lamberts Creek 6	225530	6303350	Artefact Scatter	Not Valid	Overland Conveyor

7.4 Interpretation of Survey Results

While artefact sites have previously been identified in close proximity to the Study Area, the compilation of previous survey data and recent surveys has not identified additional artefact sites. These results are consistent with the predictive model. The Newnes Plateau above also contained no areas that exhibited the features for a PAD within the twenty metre survey area and ten metre footprint.

The survey coverage table is required as part of OEH requirements (DECCW 2010) and its purpose is to give an indication of the level of probable detection of artefact sites.

Table 12 Survey coverage data of proposed surface impact footprint (PSIF)

Survey Unit (SU)	Landform	Centennial Proposed Modification	Survey Unit Area (Square metres)	Exposure (%)	Visibility (%)	Auto calculated Effective Coverage (square metres)	Enter Effective Coverage (percent)
SU 1	Modified Slope	Mt Piper Power Station	435,709 m ²	80%	75%	217855	50
SU2	Modified Slope	Northern Study Area	356898 m ²	50%	75%	285518	80
SU 3	Steep Slope	Southern Study Area	76250 m ²	35%	50%	15250	20

8.0 Heritage Significance Assessment

8.1 Aboriginal Heritage Significance

In order to develop appropriate heritage management outcomes, it is necessary for the significance of Aboriginal sites or areas of archaeological sensitivity to be assessed. Aboriginal heritage sites can have a number of values that make them significant. Four values for identification and assessment of significance have been outlined in the Burra charter (Australia ICOMOS 1999) and have been used for this assessment according to the guidelines (OEH 2011). The four values outlined in the Burra charter are: scientific, social, historical and aesthetic. Scientific value, also referred to as archaeological value, has been assessed by RPS archaeologists (**Table 13**).

8.1.1 Scientific (Archaeological) Significance Criteria

Scientific significance, also referred to as archaeological significance, is determined by assessing an Aboriginal heritage site or area according to archaeological criteria. The assessment of archaeological significance is used to develop appropriate heritage management and impact mitigation strategies. Criteria for archaeological significance have been developed in accordance OEH guidelines (OEH 2011).

Table 13 Archaeological significance criteria.

Criteria	Description
Research Potential	This criterion is used to identify whether a site has the potential to contribute new information to the interpretation of Aboriginal occupation.
Rarity	This criterion examines the frequency of the identified site types with others previously recorded in the local or regional landscape.
Representativeness	All sites are representative of a site type, however, some sites may be in better condition, or demonstrate more clearly a particular site type. Representativeness is based on the understanding of extant sites in the local or regional landscape and the purpose of this criterion is to ensure a representative sample of sites is conserved for future generations.
Education Potential	This refers to whether the site has the potential to contribute to the public understanding of Aboriginal cultural heritage. These sites are often well preserved and have recognisable features which would assist in teaching.

The archaeological significance criteria are usually assessed on two scales: local and regional; in exceptional circumstances, however, state significance may also be identified. Archaeological significance criteria is assessed in three levels to which scores are assigned; low (score=1), moderate (score=2) and high (score=3).

A combination of these scores then enables an overall significance ranking of the site to be determined.

- Low significance 3-6
- Moderate significance 7-9
- High significance 10-12

8.1.2 Assessment of Archaeological Significance

The archaeological significance of the identified Aboriginal site(s) has been assessed and is summarised in **Table 14**.

Table 14 Assessed levels of significance (Scientific) for Aboriginal Sites

Site	Site Type	Significance scale	Research Potential	Representativeness	Rarity	Education Potential	Rank (Total Score)	Overall Archaeological Significance
#45-1-0210	Artefact Scatter	Local	1	1	1	1	4	Low
		Regional	1	1	1	1	4	Low
#45-1-0218	Artefact Scatter	Local	1	1	1	1	4	Low
		Regional	1	1	1	1	4	Low
#45-1-0237	Artefact Scatter	Local	1	1	1	1	4	Low
		Regional	1	1	1	1	4	Low
#45-1-2721	Artefact Scatter	Local	1	1	1	1	4	Low
		Regional	1	1	1	1	4	Low
#45-1-2723	Artefact Scatter	Local	1	1	1	1	4	Low
		Regional	1	1	1	1	4	Low
#45-1-2724	Artefact Scatter	Local	1	1	1	1	4	Low
		Regional	1	1	1	1	4	Low
#45-1-2758	Scarred Tree	Local	1	2	1	1	5	Low
		Regional	1	1	1	1	4	Low

8.1.3 Cultural (Aboriginal) Significance Criteria

The Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011:3) recognises that Aboriginal cultural heritage significance is equal in importance to the context in which the object or place was found. The registered Aboriginal parties for this Project were given the opportunity to consider the sites in terms of the following values:

- Social Values (spiritual, political and cultural aspects of the site);
- Aesthetic Values (visual aspect of the site); and
- Historic Values (aesthetic and social value combined).

Social value encompasses the spiritual, political, national or other associations to a majority or minority group. Aesthetic value encompasses aspects of sensory perception including form, scale, colour, texture and material of the fabric. Historic value is the history of the place, its association with historic figure and/or its role in a historical event.

8.2 Historic Heritage Significance

There are two historic heritage items identified in or abutting the Study Area: “the Cottage” (I191) and the European Surveyor’s Tree (EST JN1).

The Cottage (I191) has been identified as having local significance listed in the Lithgow LEP.

The European Surveyor’s Tree (EST JN1) while representing past surveying activity in the region is not unique and there are other examples of this kind of marking elsewhere in the region. It does not meet the heritage criteria for local listing.

9.0 Impact Assessment

The proposed works is the installation of a water transfer pipeline. This will include construction, limited vegetation clearance and track clearance and as a result there will be some ground surface disturbance.

The curtilage of one historic item, the Cottage (I191) extends into the Study Area, but the built heritage items associated with this listing are not in the Study Area. One unlisted historic heritage item abuts the Study Area, European Surveyor's Tree (EST JN1).

There are seven extant Aboriginal AHIMS sites which are within 30 metres of the Study Area. These areas will need to be marked as No Go Zones to prevent harm to the Aboriginal objects at the sites.

9.1 The Cottage (I191)

The built heritage associated with the item does not extend into the Study Area. The Study Area encapsulates a 10 x 10 metre section of the curtilage. The proposed works will have minor visual impact on this heritage item, but will not impact any built heritage. Works should be limited to the 10 metre x 10 metre area identified, but no additional mitigation measures required.

9.2 European Surveyor's Tree (EST JN1)

This unlisted heritage item abuts the Study Area and thus is unlikely to be directly impacted by works. This area will need to be marked as a NO GO ZONE to prevent harm to the item and to prevent access during construction.

9.3 AHIMS Sites (AHIMS #45-I-0210, AHIMS #45-I-0218, AHIMS #45-I-0237, #45-I-2721, 45-I-2723, #45-I-2724, AHIMS #45-I-2758)

AHIMS #45-1-0210, AHIMS #45-1-0218, AHIMS #45-1-0237 are artefact scatters, #45-1-2721, #45-1-2723, #45-1-2724 are isolated finds and AHIMS #45-1-2758 is a scarred tree. None are in the Study Area, but are within 30 metres of the disturbance footprint and Study Area boundary. Prior to any works being undertaken in these areas the sites should be protected and clearly marked as NO GO ZONES to prevent harm to the artefacts at these sites.

10.0 Conclusions and Recommendations

This CHIA has undertaken the necessary background research and visual inspections required to identify historic and Aboriginal heritage and assessed the potential impact of the proposed works in relation to the installation of the pipeline.

This assessment has identified that the curtilage of The Cottage (Item Number I191) on Lot 101, DP829410 Castlereagh Highway, a historic heritage item listed on the Lithgow LEP, extends into the Study Area, but the heritage buildings associated with this item are located approximately 200 metres east of the Study Area. The Study Area encapsulates a 10 metre x 10 metre section of the curtilage. The proposed works will have minor visual impact on this heritage item, but will not harm any built heritage and thus satisfies the Section 121S (2) of the EP&A Act 1979. Works should be limited to the 10 metre x 10 metre area identified.

One unlisted heritage item, European Surveyor's Tree (EST JN1) abuts the Study Area. As such, this area should be clearly marked as a NO GO ZONE to prevent access during construction and thus prevent harm to the heritage item by the proposed works.

There are seven extant Aboriginal sites: AHIMS #45-1-0210, AHIMS #45-1-0218, AHIMS #45-1-0237 are artefact scatters, #45-1-2721, #45-1-2723, #45-1-2724 are isolated finds and AHIMS #45-1-2758 is a scarred tree. None of these Aboriginal sites are in the Study Area, but are within 30 metres of the Study Area boundary. These areas should be clearly marked as NO GO ZONES to prevent access during construction works.

Recommendation 1

The proposed works within the curtilage of The Cottage (I191) must be limited to the 10 metre x 10 metre section of the Project Application Area and not further encroach on the curtilage of this item (**Figure 4**).

Recommendation 2

The proposed works must be limited to the defined Project Application Area. NO GO ZONE areas should be marked prior to and during construction for: European Surveyor's Tree (EST JN1), AHIMS #45-1-0210, AHIMS #45-1-0218, AHIMS #45-1-0237 (artefact scatters), AHIMS #45-1-2721, #45-1-2723, #45-1-2724 (isolated finds) and AHIMS #45-1-2758 (scarred tree) (**Figure 6**).

Recommendation 3

If during works suspected Aboriginal or skeletal material is identified then procedures outlined in Centennial's *Western Holdings Aboriginal Cultural Heritage Management Plan 2014* (ACHMP) (Centennial Coal 2014) must be followed.

Recommendation 4

If during works suspected historic material is identified then procedures outlined in Centennial's *Historic Heritage Management Plan Western Holdings 2014* (HHMP) (Centennial Coal 2016) must be followed.

11.0 References

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12.0 Plates



Plate 1 MPPS - view to north



Plate 2 View north west showing culvert



Plate 3 Formed roads in MPPS - view to west



Plate 4 Modified mid slope area at MPPS



Plate 5 View east close to conveyor belt



Plate 6 Vegetation to east of MPPS



Plate 7 View east to Surveyor's Tree EST JN1



Plate 8 Scars on Surveyor's Tree EST JN1



Plate 9 Top scar



Plate 10 Modified mid slope area at MPPS



Plate 11 Track close to conveyor - view to east



Plate 12 Modified area to south of conveyor



Plate 13 View to east along overland conveyor



Plate 14 Cleared area adjacent to conveyor



Plate 15 Track adjacent to conveyor view to east



Plate 16 View south -clearing mid slope area



Plate 17 View north - treed area close to track



Plate 18 Conveyor area view south



Table 15 Clearing to north of overland conveyor



Plate 19 View to south to overland conveyor



Plate 20 Access track to north of conveyor



Plate 21 Track to east of overland conveyor



Plate 22 Paddock to north east of conveyor



Plate 23 Overland conveyor area view east



Plate 24 Modified land surface near conveyor



Plate 25 View north east from conveyor



Plate 26 Track to west of overland conveyor



Plate 27 View west along top of conveyor tunnel



Plate 28 Conveyor Tunnel – view north



Plate 29 Conveyor area - view east



Plate 30 View east near Wolgan Road



Plate 31 Conveyor near Wolgan & Skelly Roads



Plate 32 Existing pipeline Skelly Rd view north



Plate 33 Existing pipeline Skelly Rd view north



Plate 34 West of LDP009 pipeline & access road



Plate 35 Modified pipeline area view north



Plate 36 Track Southern Route view east



Plate 37 Vegetation mid slope view south



Plate 38 Rock outcrop below Newnes Plateau



Plate 39 Rock outcrop south of Newnes Plateau



Plate 40 Southern Route view north east



Plate 41 View east along Southern Route



Plate 42 Track Northern Route view north east



Plate 43 View north - vegetation Northern Route



Plate 44 View along North Route modified area



Plate 45 Rock outcrop to north of North Route



Plate 46 Cliffs to north of Northern Route



Plate 47 Creekline to north of Northern Route