Lidsdale Siding Upgrade Project

Environmental Assessment

Prepared by:

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Approval for Issue

Name	Signature	Date
Rob Dwyer		31 Aug 2012

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STATEMENT OF CERTIFICATION

As author of the Environmental Assessment, I confirm that the information contained in this Environmental Assessment is considered to be a true and accurate reflection of the Lidsdale Siding Upgrade Project and is not considered to be either false or misleading.

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RPS Australia East Pty Ltd

ABBREVIATIONS

Abbreviation	Meaning
AADT	Annual Average Daily Traffic
ACHMP	Aboriginal Cultural Heritage Management Plan
AEMR	Annual Environmental Management Report
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information System
ALS	Australian Laboratories Services Environmental
ANZECC	Australian and New Zealand Environment Conservation Council
CCL	Consolidated Coal Lease
CO_2	Carbon dioxide
DA	Development Application
DECCW	Department of Environment, Climate Change and Water (NSW) (now known as Office of Environment and Heritage)
DEWHA	Department of the Environment, Water, Heritage and the Arts (Commonwealth) (now known as SEWPaC)
DGRs	Director General's Requirements
DII	Department of Industry and Investment (NSW) (now under Department of Trade & Investment, Regional Infrastructure and Services)
DoPI	Department of Planning and Infrastructure (NSW)
DTIRIS	Department of Trade & Investment, Regional Infrastructure and Services (NSW)
DUAP	Department of Urban Affairs and Planning (now DoPI)
DWE	Department of Water and Energy
EA	Environmental Assessment
EEC	Endangered Ecological Community
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
FEL	Front-end-loader
FMA	New South Wales Fisheries Management Act 1994
GDE	Groundwater Dependant Ecosystem
GHG	Greenhouse Gas
HNCMA	Hawkesbury-Nepean Catchment Management Authority
ILUA	Indigenous Land Use Agreement
KTP	Key Threatening Process
LDP	Licensed Discharge Point
LEP	Local Environmental Plan
LPMA	Land and Property Management Authority
Ml	Megalitres
ML	Mining Lease
MSDS's	Material Safety Data Sheets
Mtpa	Million tonnes per annum
MW	Monitoring wells
NGER	National Greenhouse and Energy Reporting Act 2007
NOW	NSW Office of Water
NorBE	Neutral or Beneficial Effect
OEH	Office of Environment and Heritage
OL	Overland conveyor
PAD	Potential Archaeological Deposit
PB	Production Bore
PEA	Preliminary Environmental Assessment
PRP	Pollution Reduction Program
PSNLs	Project Specific Noise Levels
Ri-Ro	Run-in/run-out

Abbreviation	Meaning
RMS	NSW Roads and Maritime Services
ROM	Run of mine (coal yield)
RTA	NSW Roads and Traffic Authority (now RMS)
SCA	Sydney Catchment Authority
SEPP	State Environmental Planning Policy
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Commonwealth)
SHR	State Heritage Register
SLP	Safe Load Program
SWMP	Site Water Management Plan
TSC Act	Threatened Species Conservation Act 1995

Executive Summary

Introduction

Ivanhoe Coal Pty Ltd (Centennial) operates the Lidsdale Siding rail loading facility, located approximately 12 kilometres northwest from the city of Lithgow south of the western coalfields of NSW. Lidsdale Siding is situated approximately 150 kilometres west of Sydney adjacent to the township of Wallerawang. The principal components of the existing Lidsdale Siding are a rail siding, an overland conveyor which delivers coal from the Centennial Coal Western Coal Services site, coal stockpiles, workshop, office and pollution control dams.

On behalf of Centennial, RPS Australia East Pty Ltd (RPS) have prepared this Environmental Assessment (EA) to support an application for Project Approval under Section 75H of Part 3A of the EP&A Act. The purpose of the application is to obtain approval for the Lidsdale Siding Upgrade Project.

The Proposal

The Project will upgrade the Lidsdale Siding facility to improve its operational efficiency and increase its throughput capacity to approximately 6.3 million tonnes per annum. The train loading process would be automated by establishing a coal stockpile with underground reclaimers feeding a conveyor leading to a train loading bin. The total stockpile capacity would be approximately 50,000 tonnes.

Whilst Part 3A has now been repealed, revised Director General's Requirements (DGRs) for the EA were issued prior to the repeal on 7 July 2011. As such, the Project is a "transition Part 3A" project to which the provisions of Part 3A continue to apply. Current DGRs for the EA were issued on the on the 31st January 2012.

The Project Site and broader study area

The Project Site covers the area within which the physical upgrades to the Lidsdale Siding operation would occur. A broader study area has been defined within which various assessments have been undertaken. The broader study area has been identified to provide an area for overall assessment so that impact upon the environment and community surrounding the site can be provided.

Environmental Assessment

Specialist assessments have been undertaken to address the key issues identified in the DGRs and agency correspondence and relate to:

- noise and vibration
- air quality
- greenhouse gas
- surface water
- groundwater
- contamination
- visual amenity
- traffic and transport
- social
- economics

- soils, land resources and agriculture
- terrestrial ecology
- aquatic ecology
- heritage

Key findings from the specialist assessments undertaken include:

- Total site sound levels in the vicinity of the Project Site are calculated to be a minimum of 9 dB lower than calculated for current operational sound levels. Up to 30 dB reduction is possible for some conditions and receivers due largely to the replacement of mobile plant with the new automatic conveyor loading system.
- The Project involves relinquishment of trucking coal into and out of the site which will have significant noise benefits.
- The Project will result in significantly reduced dust deposition rates at all surrounding receptor locations when compared to the current situation. The calculations of annual TSP emissions resulting from current site operations indicate that the emissions are up to 5.5 times greater than what is predicted to be emitted once the site is upgraded. PM_{10} and $PM_{2.5}$ emissions are calculated as currently being approximately 4 times greater than those predicted following site upgrade.
- Direct (Scope 1) GHG emissions (CO2-e) resulting from the Project operations are estimated to be 162 tonnes per annum (tpa), a decrease of approximately 1,480 tpa on current operations. Indirect (Scope 2) GHG emissions (CO2-e) resulting from Project operations are estimated to be 1,074 tpa, an increase of approximately 899 tpa on current operations.
- The Project does not involve any significant changes to the site in terms of surface water drainage and existing surface water control systems on site are more than adequate to cater for the Project. A erosion and sediment control strategy will be implemented as part of the Construction Environmental Management Plan for the Project Site.
- No groundwater sources or aquifers have been identified that would require sterilisation from future water supply use as a consequence of the Project. There will be only very minor change in the overall base flow contribution in the Pipers Flat Creek system with a maximum loss of 0.2m3/day.
- The Project is unlikely to have an adverse impact in relation to contamination matters during the construction or the operational phase.
- The expected visual impacts of the Project will be moderate. Visual screening and other measures proposed will reduce but not eliminate such impacts.
- The queuing at the Main Street railway crossing, Wallerawang is predicted to be minimal however some upgrading to the current road line marking is required to satisfy Australian Standard 1742.7-2007.
- The potential for traffic queues at the Duncan Street / Brays Lane railway crossing is expected to be minimal due to the low level of local traffic associated with this lane.
- The Project will have an overall positive economic contribution at a regional level and also to the local community. The local community will benefit from an overall decrease in noise levels and operations of the Project will provide a measurable improvement in air quality in the local area.
- Economic benefits during the construction phase of the Project maybe as much as $121 Million (M) with an estimated incremental impact of $1,668 M. The Project may stimulate an additional $1.4 Billion in economic activity and 2,637 full time equivalent (FTE) jobs in the regional economy over the assumed 15 year project forecast.
- The agricultural suitability classification of the Project Site and broader study area is Class 5. This class of land is marginal land not suitable for cultivation and has very low potential for grazing. Hence the Project will not result in the loss of prime agricultural land.
- The Project is not expected to have a significant impact on the ecology of the Project Site or broader

study area, including threatened flora, threatened fauna or endangered ecological communities that are known or expected to occur therein.

- There are no aquatic Groundwater dependent Ecosystems (GDEs) in the lower Pipers Flat Creek or Coxs River within the vicinity of the Project Site or broader study area.
- The Project Site and broader study area is well removed from any listed Heritage Items. In relation to Indigenous heritage, there are no constraints contained within the Project Site. Some Isolated Finds and Artefact Scatters were identified within the broader study area however these will not be impacted upon.

Based upon the recommendations for mitigation measures within the specialist assessments, the measures associated with the Statement of Commitments from Centennial include:

- Preparation of a Construction Environmental Management Plan prior to construction commencing which will include specific control measures covering noise and dust controls, soil and water management, groundwater management, traffic management and weed control issues.
- Design and implementation of a site specific study to determine the characteristics of coal being transported off-site. The study will determine the Dust Extinction Moisture (DEM) level of the coal as it is transported from Lidsdale Siding. This study will allow a quantification of the likely particulate matter emissions from each coal surface type and also identify the efficacy of dust mitigation measures over the likely time of transport from site to Port and may result in further mitigation measures for the control of dust from rail transport.
- Water sprays will be located on the main stockpile and conveyor transfer point to reduce particulate emissions due to wind erosion.
- A visual screen consisting of native tree and shrub species comparable to the existing forested areas to the north of the Project Site will be planted
- Contribution to the upgrade of road line marking in the vicinity of the level rail crossing on Main Street to satisfy AS1742.7-2007, Manual of Uniform Traffic Control, Part 7: Railway Crossings.
- Progressive removal of Willows within the section of Pipers Flat Creek which passes through the broader study area.

1.0 Introduction

1.1 Background

The Lidsdale Siding facility is used to distribute coal by rail from Centennial Coal's western region mines to port facilities on the NSW coast.

Ivanhoe Coal Pty Ltd (Centennial Ivanhoe) is a wholly owned subsidiary of Centennial Coal (Centennial). This Environmental Assessment has been prepared on behalf of Centennial under Section 75H of Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the proposed Lidsdale Siding Upgrade Project.

This Environmental Assessment (EA) has been prepared to support an application for the upgrade of the Lidsdale Siding facility and has been prepared in accordance with the DGRs as issued.

A Preliminary Environmental Assessment (PEA) for the Project was submitted to the then Department of Planning in September 2008. Director-General Requirements (DGRs) were subsequently issued in November 2008. On-going consultation between Centennial and the Department of Planning and Infrastructure (DoPI) has resulted in the issuing of revised (DGRs) on 31 January 2012.

1.2 Project Site

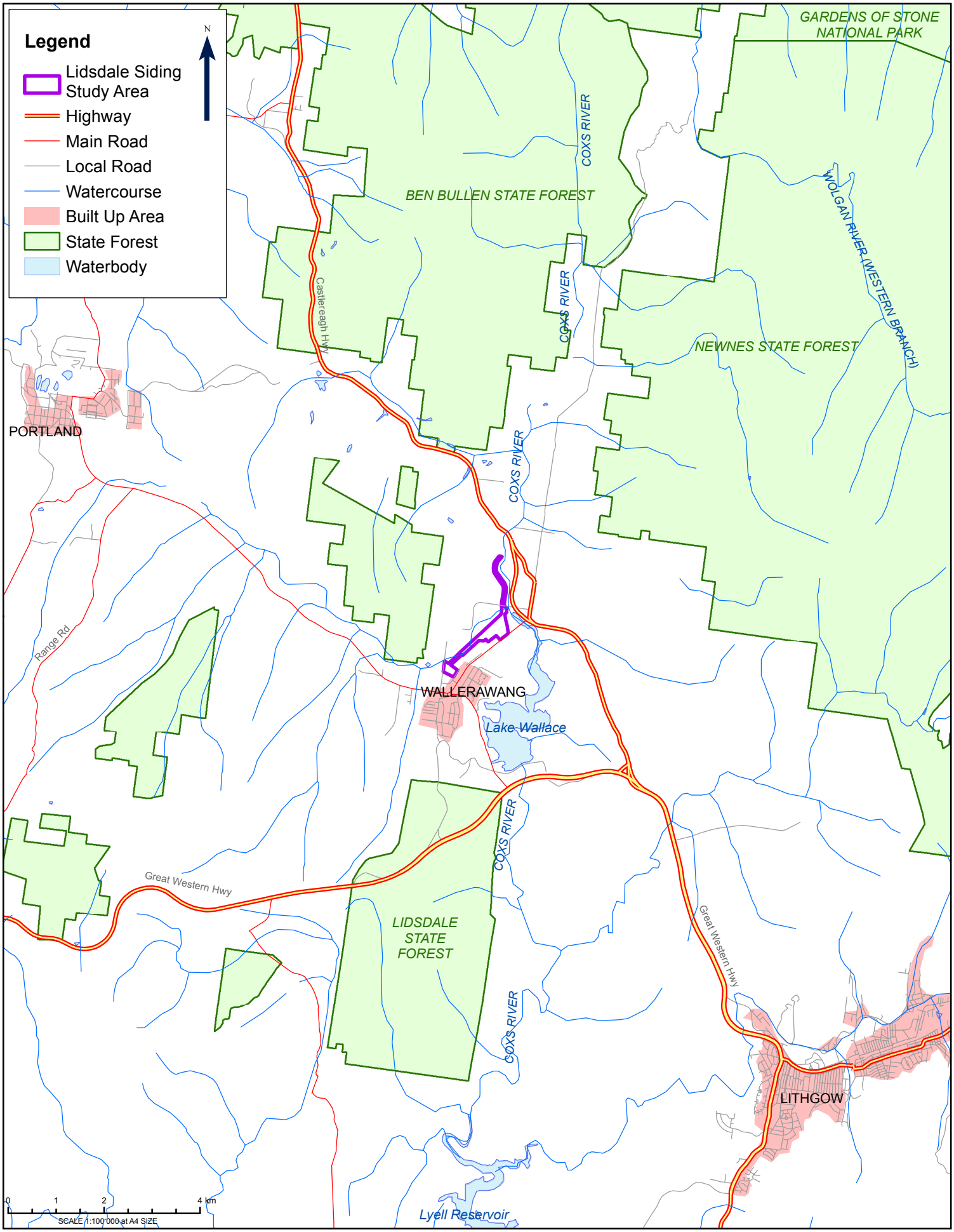
The location of Lidsdale Siding is shown in **Figure 1**. It is situated approximately 500 metres north of the township of Wallerawang and approximately nine kilometres north west of Lithgow. The siding is located on a dedicated spur line from the Main Western Railway Line.

The Project Site for the Upgrade is identified in yellow on **Figure 2** and covers the area within which the physical upgrades to the Lidsdale Siding operations will occur. The red boundary identified on **Figure 2** defines a larger area for which various assessments have considered having regard for proximity to the existing facilities and the lease held over this area by Centennial.

1.3 Overview of the Project

Centennial is proposing to upgrade the Lidsdale Siding facility to improve its operational efficiency and increase its throughput capacity to approximately 6.3 million tonnes per annum. The train loading process would be automated by establishing a coal stockpile with underground reclaimers feeding a conveyor leading to a train loading bin. The total stockpiling capacity would be approximately 50,000 tonnes. The main physical components of the Project are:

- a new diversion chute at the end of the existing overland conveyor to load coal onto the stockpile conveyor. This chute can also divert coal to an auxiliary stockpile under unplanned stop conditions for the stockpile conveyor so that the overland system does not need to be shutdown
- an elongated conical stockpile and associated push out area
- an auxiliary stockpile for the diversion of coal from the conveyor system
- an elevating stockpile conveyor and gantry to feed the existing coal stream to the elongated conical stockpile
- underground tunnel with reclaimers beneath the elongated conical stockpile
- a train loading bin incorporating coal weighing
- a conveyor from the reclaim tunnel to the train loading bin



TITLE: FIGURE 1: SITE LOCATION	LOCATION: LIDSDALE SIDING	DATUM: GDA94 PROJECTION: MGA Zone 56	DATE: 13/03/2012 PURPOSE: ENVIRONMENTAL ASSESSMENT	LAYOUT REF: PR110912-1-001b VERSION (PLAN BY): Rev B (TW)

CLIENT: Centennial Coal
JOB REF: PR110912-1

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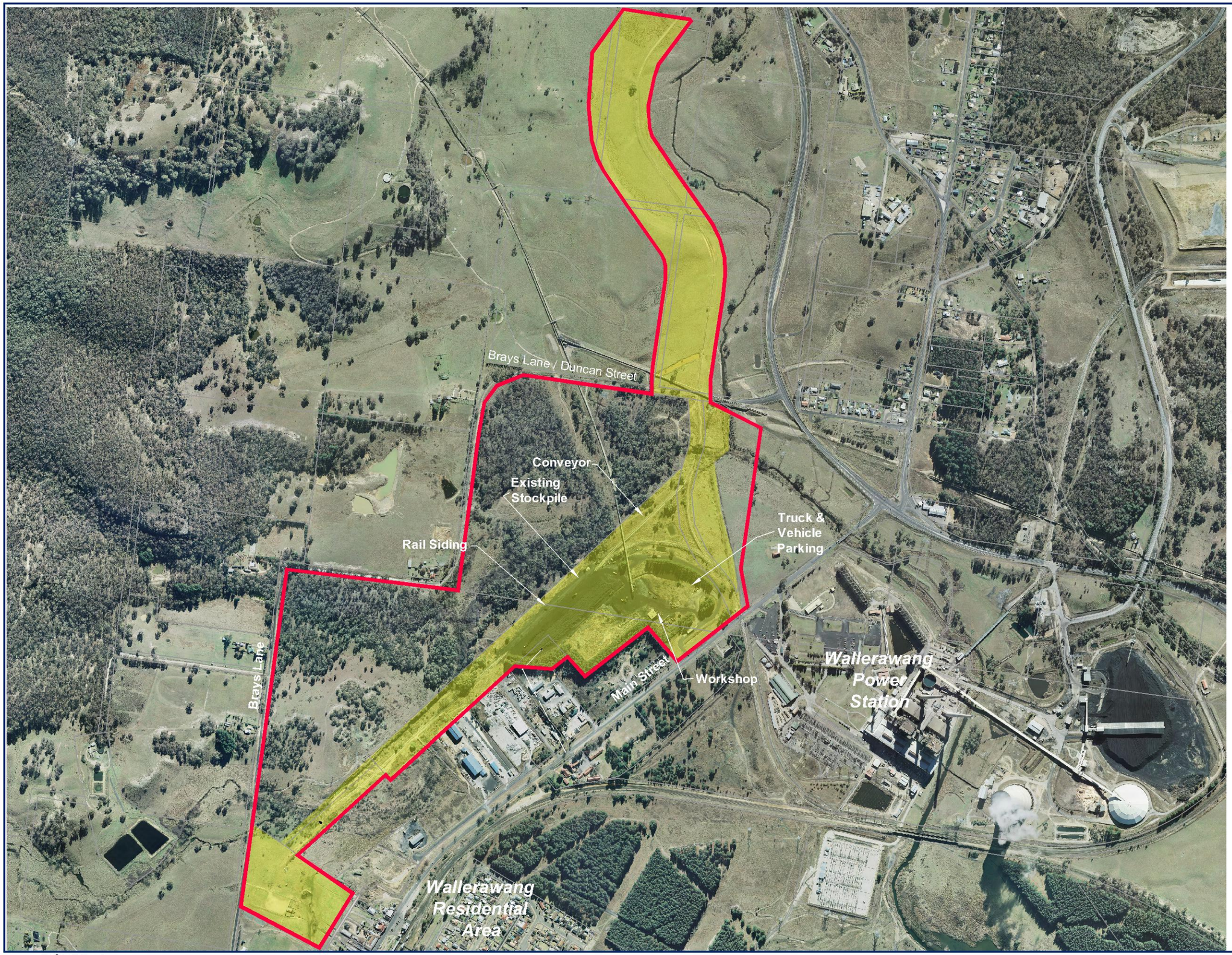

MGA

Legend

Lidsdale Siding Upgrade Project Site

Study Area for various assessments within the EA

0 100 200 300 400 500

SCALE 1 : 10,000 (A3)

FIGURE 2

TITLE: LIDSDALE SIDING UPGRADE PROJECT
PROJECT SITE PLAN

LOCATION: WALLERAWANG

DATUM: (GDA 94)
PROJECTION: PROJECT AREA

6TH AUGUST 2012
ENV. ASSESSMENT

AUTOCAD REF: 110912 UPGRADES TO PROJECT AREA
VERSION (PLAN BY): LOCATION PLAN

CLIENT: CENTENNIAL COAL
JOB REF: 110912

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- a spillage reclaim pit beneath the train loading bin
- a control room adjacent to the train loading bin
- a track extension to the existing rail siding with additional parallel siding
- water supply, dust suppression, reticulation upgrade and water management structures as required
- landscaping and bunding as required
- a new transformer to upgrade power
- lighting for night operation and security
- erection of perimeter fencing and signage
- storage infrastructure
- mobile refuelling facility and the provision of a self bunded transportable fuel tank near the rail loading bin.

The following operations of the Project are:

- handling an increased quantity of coal from 2 million tonnes per annum to up to approximately 6.3 million tonnes per annum (Mtpa)
- all coal would be delivered by the existing overland conveyor system
- increased train movements from two to an average of five per day and a peak of seven trains per day
- increased rate of operation of the existing conveyor from the Centennial Coal Western Coal Services Site and operation of this conveyor, the feeder and the proposed reclaimer
- blending of coal on site
- railyard activities, being storage, provisioning and minor maintenance of locomotives and wagons normally accessing the site for loading
- maintenance of onsite infrastructure and site amenities
- maintenance and inspection of on-site machinery including locomotives and rolling stock
- fuelling of on-site machinery (including locomotives) from mobile tankers and a self bunded transportable fuel tank
- environmental management measures including sprinkler use for dust suppression, truck wash, monitoring activities, waste removal and noise attenuation
- use of the existing weighbridge and weighing of wagons

The Project is described further in Section 4.

1.4 Director General's Requirements

A Preliminary Environmental Assessment (PEA) was submitted as a part of a request for the DGRs for the EA to the then Department of Planning in September 2008. DGRs were subsequently issued in November 2008. Since these DGRs were issued a request for revised DGRs was made by Centennial in 2011 for a revised Project to increase throughput. Revised DGRs were issued by the Department of Planning and Infrastructure (DoPI) in July 2011.

Since the revised DGRs issued in July 2011, Centennial consulted DoPI about further revisions to the Project. Revised DGRs were subsequently issued on 31 January 2012 and are contained in **Appendix 1**.

Part 3A of the EP&A Act was repealed on 1 October 2011. Clause 2 of Schedule 6A relevantly provides that, where DGRs for a project were last notified within 2 years before 1 October 2011, the project is a 'transitional Part 3A project'. Clause 3 of Schedule 6A provides that Part 3A continues to apply to transitional Part 3A projects notwithstanding its repeal.

For this reason the previous Part 3A system continues to apply for this Project. Hence this EA has been prepared in accordance with the DGRs as issued on 31 January 2012. Section 8 provides a table identifying how the DGRs have been addressed by this document.

1.5 Environmental Assessment Structure

The purpose of this EA is to enable consideration of the implications of proceeding with the Lidsdale Siding Upgrade Project. It has been prepared in accordance with the applicable legislative framework and industry standards, and in consultation with relevant government agencies and stakeholders. In summary, the EA is structured as follows:

- Section 1 outlines the Project background.
- Section 2 provides a description of the existing facility, the Project Site and an overview of land ownership issues.
- Section 3 provides a discussion on alternatives to the Project.
- Section 4 provides a detailed description of the Project.
- Section 5 outlines the statutory planning context applicable to the Project.
- Section 6 sets out the consultation undertaken so far.
- Section 7 identifies the key environmental issues for the Project.
- Section 8 contains an assessment of the potential environmental and socio-economic implications of the Project, including cumulative impacts.
- Section 9 identifies the Statement of Commitments intended to be adopted for the Project.
- Section 10 outlines the justification for the Project and contains the conclusion to the EA.
- Section 11 lists the reference documents referred to within the EA.

2.0 The Existing Facility and the Project Site

2.1 Existing Facility

2.1.1 Location

The location of the project is shown in **Figure 1**and **Figure 2**. It is situated to the west of the Blue Mountains in New South Wales approximately 1.5 kilometres to the south west of the village of Lidsdale and immediately north of the township of Wallerawang. To the east of the Project Site is the Wallerawang Power Station.

2.1.2 Ownership

Land ownership within the bounds of the Project Site is shown on **Figure 3**. As evident, the site comprises land owned by:

- Ivanhoe Coal Pty Limited (Centennial)
- State Rail Authority
- Delta Electricity

As indicated on **Figure 3** land owned by the State Rail Authority is under lease or sub-lease to Centennial. Land west of the Project Site owned by the State Rail Authority and within the defined broader study area is subject of negotiations between Centennial and the State Rail Authority.

2.1.3 Historical Operations

Lidsdale Siding has been used as a coal storage and rail loading facility continually since 1974. Prior to 1974, the site was utilised as a rail yard facility operated by the State Rail Authority. The Project Site contains large flat areas associated with the stockpiles and rail loading area, a workshop, a weigh bridge and a site office. The majority of the Project Site has been cleared of native vegetation and contains three pond areas used for water management and controlling water discharge from the site.

A review of land titles, parish maps and aerial photography suggests that until the late 1950s or early 1960s the facility was used primarily for agricultural and grazing purposes when Piper's Flat Creek, originally flowing through the south-western section of the site, was rechannelled to the north and the existing railway siding was constructed.

Aerial photography suggests that the site was still predominantly open ground until the mid 1970s when it became an operational coal loading facility. Initially coal was only trucked to the site for loading with additional access being provided by the overland coal conveyor constructed in the mid-1990s.

The title information shows that the site has been leased to a number of proprietors for grazing purposes until the 1950s when the land was taken over by the Joint Coal Board, and later the State Rail Authority. The rail loading facility has been in operation since the mid-1970s and a number of coal mining companies have held the lease since 1978.

2.1.4 Existing Approvals, Leases, Licenses and Titles

A summary of the available records regarding approvals and modifications at the Lidsdale Siding are presented in **Table 1** below. It is understood that some of the planning and approval documents in relation to Lidsdale Siding are not available as they were destroyed by a fire at the former Blaxland Shire Council building.

MGA

174
DP 751651

164
DP 751651

16
DP 751651

101
DP 1137972

Brays Lane / Duncan Street

8
DP 252472

32
DP 827807

1
DP 252472

9
DP 252472

2
DP 252472

6
DP 252472

13
DP 827839

Main Street

Brays Lane

Wallerawang Power Station

7
DP 252472

1
DP 776498

Wallerawang Residential Area

Legend

Lidsdale Siding Project Site and broader Study Area

LAND OWNERSHIP

IVANHOE COAL PTY LIMITED

STATE RAIL AUTHORITY

DELTA ELECTRICITY

AREA OF LAND LEASED BY CENTENNIAL

AREA OF BUFFER LAND CURRENTLY UNDER NEGOTIATION BETWEEN CENTENNIAL AND LANDOWNER

0 100 200 300 400 500

SCALE 1 : 10,000 (A3)

FIGURE 3

TITLE: LIDSDALE SIDING UPGRADE PROJECT
LAND OWNERSHIP

LOCATION: WALLERAWANG

DATUM: (GDA 94)
PROJECTION: PROJECT AREA

14TH AUGUST 2012
ENV. ASSESSMENT

AUTOCAD REF: 110912 UPGRADES TO PROJECT AREA
VERSION (PLAN BY): LAND OWNERSHIP

CLIENT: CENTENNIAL COAL
JOB REF: 110912

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Table 1: Existing Environmental Approvals

Date	Organisation /Agency	Details
June 1974	Austen and Butta	Development Application (DA) submitted to Blaxland Shire Council for rail loading and coal stockpiling facility.
June 1974	Blaxland Shire Council	Approval granted for rail loading and coal stockpiling facility.
May 1980	Council of the City of Greater Lithgow	Approval granted for diesel storage and dispensing facilities.
July 1983	Council of the City of Greater Lithgow	Approval granted for construction of a workshop.
March 1985	Austen and Butta	Development Application submitted to Greater Lithgow City Council for re-shaping of the coal stockpile, extension of rail track and relocation of rail points.
March 1985	Council of the City of Greater Lithgow	Approval granted for re-shaping of the coal stockpile, extension of rail track and relocation of rail points.
January 2012	John Holland Rail	Main Western Rail Line – Lease of siding and Associated facilities
16 July (Anniversary date)	Office of Environment and Heritage (OEH)	Environmental Protection Licence (EPL 5129) - Water quality leaving the site for EPL compliance.

The four Council approvals listed in the table above form the planning consent platform for the existing Lidsdale Siding operation.

2.2 Existing Operations and Environmental Management

The existing operations at the site are consistent with its known approved use as a coal storage and loading facility. The main activities undertaken include receiving coal from the overland conveyor from the Centennial Coal Services Site, the ongoing maintenance and replenishing of the stockpile, loading of trains by front end loader, and unloading of coal delivered by road.

The Lidsdale Siding Coal Loading Facility is currently used for the distribution of coal from Centennial's western region mines, to the ports on the NSW Coast via the Main Western Railway line. The majority of coal delivered to Lidsdale Siding is from overland conveyor from the Springvale operation via the Coal Services Site. Coal from the Ivanhoe North operation is delivered to Lidsdale Siding by truck.

Currently coal is moved by front end loader and trucks from the stockpile beneath the overland conveyor to the train loading stockpile along the western portion of the facility. Front end loaders also move coal from the truck dump stockpiles to the train loading area. The coal is then loaded from the stockpile onto the train wagons by front end loader.

The existing facility comprises the following:

- Office and weigh bridge complex
- overland conveyor
- rail siding
- machinery workshop
- minor coal stockpile at conveyor
- hardstand consisting of compacted coal reject
- major coal stockpile adjacent to train loading area
- various internal roads for access and stockpile management.

The objective of the Project is to significantly improve the efficiency of the existing operation.

2.2.1 Existing Environmental Management and Monitoring

Lidsdale Siding operates under an Environmental Management System and a series of environmental management plans. These plans currently specify the type and location of environmental monitoring, management of noise, dust and pollution control. The current monitoring program includes:

- Dust deposition at three locations
- Continuous noise measurements on site
- Continuous weather data from a dedicated on site weather station
- Groundwater from 6 monitoring bores and the production bore on a quarterly basis
- Surface water monitoring of pollution control ponds on a quarterly basis
- Monitoring of water quality and discharge volume when discharging
- Background water quality monitoring in Pipers Flat Creek on quarterly basis
- Metered monitoring of pump volumes.

The facility also operates under an Environmental Protection Licence (EPL) Licence – 5129 for coal works. The licence limits discharges to air and water and sets monitoring and recording conditions and reporting conditions.

Under the conditions of the existing EPL 5129, there is a requirement to undertake monthly dust monitoring from three dust monitoring gauges on site, a Dust Management Plan is currently in place. The impact assessment criterion for annual average dust deposition is 4 g/m^2/month.

Monitoring of water quality at the discharge site to Pipers Flat Creek is a condition of the current EPL 5129. While it is not anticipated that there would be any additional discharges to the Pipers Flat Creek resulting from the upgrade of the Siding, monitoring would continue to occur daily during any discharge from the site in accordance with the EPL.

The following environmental management and monitoring plans are currently in place for the facility:

- Centennial – Lidsdale Siding: Rehabilitation and Closure Plan
- Centennial – Lidsdale Siding: Dust Management Plan
- Centennial – Lidsdale Siding Waste Management Plan

2.2.1.1 Water Management

Pipers Flat Creek transects across the northern portion of the Project Site close to its merging with the Coxs River. The Project Site is within the Upper Coxs River sub-catchment which is part of the Hawkesbury Nepean Catchment Management Authority area.

The storage areas comprising the current Lidsdale Siding Water Management System consists of three storage ponds, the Control Pond, the Middle Pond, located in a narrow area between the internal road and the railway embankment, and the downstream Triangle Pond, located in the area bounded by the three railway embankments.

Due to its location in the landscape and the surrounding topography, there is very little drainage from surrounding areas onto the Project Site other than some runoff from a small section of Main Street, Wallerawang, which will be rectified as part of this project. Any runoff, from precipitation or water use, flows first to the Control Pond. This is the first and main pollution control pond for the existing operations. The

Control Pond consists of two ponds arranged side by side which becomes a single pond as it fills to a capacity of 4,900m3. The Control Pond has a spillway structure leading to a culvert below the railway line that consists of 5 x 900mm diameter pipes draining to the Middle Pond. Middle Pond has a capacity of approximately 500m³ and a spillway structure consisting of 5 x 900mm diameter culverts linking it to the Triangular Pond. The Triangular Pond has a 4,000m3 capacity and a spillway structure consisting of 5 x 900mm diameter culverts that provide the discharge point to the Coxs River.

EPL 5129 allows for the discharge of water from the Triangle Pond into a stormwater discharge channel, which flows into the Pipers Flat Creek. Water discharged from the facility is required to be monitored for quality at Licensed Discharge Point (LDP) number 004. The limits for pollutant discharge as specified in EPL 5129 are summarised in **Table 2**.

Table 2: Licensed Allowable Discharge from Site

Pollutant at LDP004	Units of measure	Percentile concentration limit	Load Limit
Oil and Grease	mg/L	10	Not Applicable
pH	pH units	6.5 – 8.5	
Total Suspended Solids (TDS)	mg/L	30	

Generally the Project Site operates as a nil discharge site. There is generally a long retention period for any water on site which would allow suspended solids (the likely main contributor to potential negative water quality impacts) to settle out before any discharge would occur.

2.2.2 Existing Rehabilitation

There are no parts of the Project Site currently considered as unutilised land. A decision is yet to be made regarding the final land use for Lidsdale Siding. Centennial will discuss land use options with the lands owners, prior to undertaking rehabilitation and closure activities at the site. However, to ensure that sufficient site rehabilitation does occur, Centennial in association with consultants GSS Environmental has prepared a Rehabilitation and Closure Plan to ensure that sufficient rehabilitation occurs upon the land at the closure of the facility. This Rehabilitation and Closure Plan is based on the current Lidsdale Siding operation and not the proposed expansion subject of this EA. This Rehabilitation and Closure Plan will be updated if the Project Site is approved and upgrade works carried out.

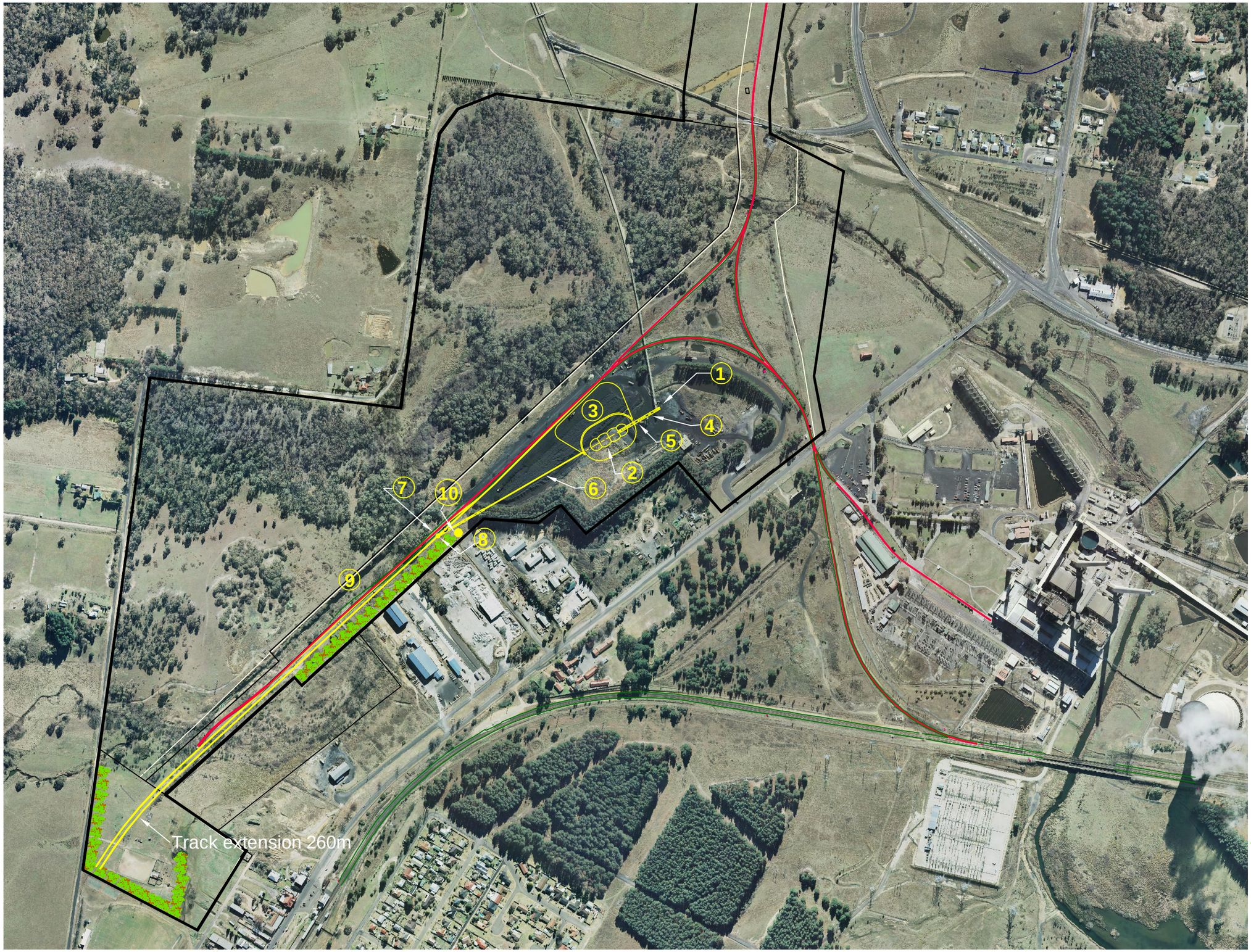
2.3 Project Site and Broader Study Area

The Project Site as identified in yellow on **Figure 2** covers the area within which the physical upgrades to the Lidsdale Siding operation will occur. The red boundary identified on **Figure 2** defines a larger area for which various assessments have considered having regard for proximity to the existing facilities and the lease held over this area by Centennial. The components of the Project are identified in **Figure 4**.

The Project Site and broader study area are of relatively low ecological value. One threatened flora species, one threatened bat species, one threatened bird species and one Endangered Ecological Community (EEC) were recorded during the surveys undertaken between 2010 and 2012.

Groundwater within the Project Site and broader study area is close to surface and is situated in the alluvial soils adjoining Pipers Flat Creek and the Coxs River.

A search of the NSW Office of Water (NOW) water licence database revealed 38 registered bores and wells within a 5km radius of the Project Site. The bores are mostly private bores, installed for domestic and stock purposes and monitoring. Six bores are installed for power generation, recreational and water conservation use. The water quality is not recorded except in nine bores and it is mainly reported as being good. The bore yield reported for a limited number of bores is relatively low and in the range of 0.5L/s to 2.5L/s.



MGA

Proposed Components:

1. Diversion chute at the end of the existing overland conveyor (Auxiliary Stockpile beneath)
2. 50 000 t elongated conical stockpile
3. General Pushout Area for elongated conical stockpile
4. Elevating conveyor to elongated conical stockpile
5. Reclaim tunnel beneath the stockpile.
6. Ground conveyor from the reclaim tunnel, elevating to the train loading bin
7. A train loading bin (nominal 250 tonne capacity)
8. Control room adjacent to the loading bin
9. Notional alignment of New Rail Line and adjacent shunt
10. Self bunded transportable fuel tank

Lidsdale Siding Study Area

EXISTING RAIL LINE

PROPOSED COMPONENTS

LANDSCAPING BUFFER

0 100 200 300 400

SCALE 1 : 7000 (A3)

TITLE: LIDSDALE SIDING UPGRADE PROJECT
FIGURE 4 PROPOSED COMPONENTS

LOCATION: WALLERAWANG

DATUM: (GDA 94)
PROJECTION: MGA Zone 56

20TH AUGUST 2012
ENV. ASSESSMENT

AUTOCAD REF: 110912 UPGRADES TO PROJECT AREA 3
VERSION (PLAN BY): PROPOSED 2

CLIENT: CENTENNIAL COAL
JOB REF: 110912

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
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RPS

Soils in the Project Site and broader study area typically have low to very low fertility. High erodibility is common as a result of hard-setting surfaces and low permeability. The widespread occurrence of acidic soils can explain the low fertility and prevalent aluminium toxicity (Hazleton & Murphy, 2009).

The agricultural suitability classification of the Project Site and broader study area is Class 5. This class of land is marginal land not suitable for cultivation and has very low potential for grazing production.

Further information about existing conditions is provided in Section 8 Environmental Assessment.

2.4 Surroundings

The land use in the areas surrounding the site is varied ranging from industrial, residential, retail, forestry, power generation and rural/agricultural pursuits. The land to the north and west of the site consists of cleared and vegetated land containing scattered residences. Grazing of livestock occurs within these areas. Further to the north east is Ben Bullen State Forest. To the south of the site is an industrial area and Main Street leading to the residential area of Wallerawang. The Wallerawang Power Station is the dominant structure in the area which is located opposite the Project Site.

Along Main Street Wallerawang, there are predominantly commercial outlets including two hotels on the western side, with the railway line and the main residential area of Wallerawang on the eastern side. On Main Street there is a residential dwelling adjacent to the facility, a church opposite the site and a motel with cabin accommodation opposite the industrial area. These are the nearest premises to the site. The church located opposite the entry of the facility on Main Street is heritage listed and there are some industrial operations which back onto the facility to the west. Further to the south west, down Main Street, there are two pubs and other commercial sites which back onto the most western part of the facility, where the track extension is proposed.

The Lidsdale Siding joins the Main Western Railway line on the southern side of Wallerawang Power Station via an existing spur line which originally linked to the Wallerawang Colliery (now Pine Dale Mine). The Wallerawang Colliery link currently only exists for a short distance north of the Lidsdale Siding. The facility is predominantly used to distribute coal from Centennial's western region mines to ports on the NSW Coast via the Main Western Railway line. The majority of coal is delivered to the facility by overland conveyor from the Springvale mine via the Centennial Coal Services site to the north-west. Coal is also delivered to the Lidsdale Siding by truck via the public road network.

Pipers Flat Creek transects across the northern portion of the Project Site close to its merging with the Coxs River. The natural course of Pipers Flat Creek has been altered from past activities so that it now flows in a constructed channel adjacent to the southern part of the Project Site. The channel was constructed in the 1970's in order to build the original siding. To the north the watercourse resumes a natural path again before flowing into the Coxs River approximately 100 m north of the site. The Coxs River continues to Lake Wallace, which is located approximately 1.5 km south-east of the Project Site.

Representative aquifer properties of the lithological units in the Project Site and broader study area, as determined from field testing and hydrogeological assessment, include the following:

- Weathered regolith, alluvial and colluvial
- Weathered bedrock, Shoalhaven Group, Triassic sandstone and Illawarra Coal Measures at the outcrop
- Shoalhaven Group, Illawarra Coal Measures

The shallow groundwater flow pattern (for groundwater within the alluvium and regolith units) is generally from the south to the north, but is locally controlled by the surface topography and stream systems.

The Project Site consists of unconsolidated alluvium/colluvium material over most of the site and is generally 2-6m thick. It is underlain by shale which is weathered in the top section (approximately 7m) and fresh below this depth. The Shoalhaven Group outcrops over most of the study area mainly to the south and west, while to the north and east of the Project Site, the Shoalhaven Group is overlain by the Illawarra Coal Measures. The Illawarra Coal Measures include shale and sandstone in addition to conglomerate, limestone, dolomite, claystone, mudstone, coal and torbanite. The Berry Formation includes grey siltstone with thin beds of limestone and sandstone (King 1993). Towards Pipers Flat Creek the underlying geology would include recent alluvium, consisting of unconsolidated sands and gravels. The soils of the site are described in Soil Landscapes of the Wallerawang 1:100,000 Sheet (King 1993) and identified on the accompanying map. The soil landscapes occurring within the site are Cullen Bullen, Pipers Flat and Disturbed Terrain.

The majority of the Project Site and broader study area is classified as disturbed terrain. Disturbed terrain is described as varying from level plains to undulating terrain that has been disturbed by human activity to a depth of at least 1 m. The original soil has been removed, greatly disturbed or buried. The limitations of this soil landscape, such as fertility, erodibility and toxicity, are highly variable (King 1993).

The Cullen Bullen soil landscape occurs in the triangular rail section of the site and near the proposed rail bin. This soil landscape is generally associated with broad rolling low hills and rises with slopes of 10-25%. On lower slopes near and along drainage lines there are moderately deep to deep (50-150 cm) yellow solodic soils and yellow podzolic soils. Topsoil fertility is generally low and there is a high water erosion hazard.

The Pipers Flat soil landscape occurs along Pipers Flat Creek and incorporates the southern part of the site along the rail line. This soil landscape is associated with drainage lines and their floodplains (mostly less than 500 m wide) with slopes level to gently inclined. Soils are moderately deep to deep (greater than 100 cm) grey-brown alluvial soils, soloths and gleyed podzolic soils. Soil fertility is generally low with high water tables and seasonal waterlogging (King 1993).

The terrain of the land to be developed is predominantly open and flat to gently undulating, and lies in the natural valley floor of Pipers Flat Creek and the Coxs River. Included on the site are rises up to 885m Australian Height Datum (AHD), with most of the site at approximately 880m AHD. The lowest contour level on the site is approximately 875m AHD located at the base of the Triangle Pond. Nearby mountain peaks reach approximately 1050m AHD and the base of the Coxs River close to Lake Wallace rests roughly at 870m AHD.

The climate of the region is considered to be cool-temperate, with mild summers and cold winters. The local climate is influenced by topography, altitude, and aspect. Maximum daily temperatures typically range between 10^{o}C and 25^{o}C. Frosts are common, particularly between May and September.

3.0 Alternatives

3.1 Alternatives Considered

This section identifies the alternative to the proposed project, that comprise:

- Alternative Location
- Alternative Designs and Layouts
- Do Nothing

3.1.1 Alternative Location

Lidsdale Siding has been in operation as a coal loading facility since 1974 and there is substantial infrastructure on site. Feasible alternatives locations for the facility would result in increased level of disturbance to both the environment and local community, therefore the Project's location is considered to be the most appropriate for the proposed upgrade works.

3.1.2 Alternative Designs and Layouts

In 2008 the objectives of the initial project as described in the PEA were:

- To eliminate the need for mobile plant and equipment to load rail wagons
- To reduce the operating costs on a per tonne basis
- To minimise environmental impacts such as noise and dust generation
- To allow dumping and loading of trucks at a hard stand area adjacent to the main conical stockpile without interfering with train loading

The above objectives together with the location of the existing infrastructure such as the rail line and the overland conveyor limit the design alternatives.

Alternatives for the transportation of coal to the site have been considered. The proposed project of 2008 involved the continued coal deliveries to the site by road. This results in approximately 200 trucks per day (100 in, 100 out). The site has had a long history of road born coal transport, however, the current proposed project proposes that all coal be received by conveyor and all coal dispatched by train. The option of continuing truck transport of coal on the public roads was rejected, in order to reduce the environmental impacts of the facility.

Options for the management of surface water have been considered in order to protect both site infrastructure and Pipers Flat Creek, which is designated as key fish habitat.

Several infrastructure variations have been considered in order to accommodate the required train movements, stabling and loading arrangements.

3.1.3 'Do Nothing'

In the event that the proposed upgrade does not proceed, the Lidsdale Siding would continue to operate in a business as usual capacity. This would result in operational constraints to Centennial's operations within the western region and the potential environmental improvements proposed as part of the project would not be realised.

4.0 Project Description

4.1 Introduction

This Section describes the need for the Project, and provides an overview of its physical components, proposed operations, construction activities, interactions with surrounding operations and rehabilitation upon closure of the facility.

4.2 Need for the Project and its Objectives

The Lidsdale Siding Upgrade Project is required to improve the efficiency of coal loading operations, to reduce operating risks and allow flexibility in providing coal to future markets, while meeting community expectations. In order to best supply the current and future domestic and international market for coal Centennial requires the ability to increase the quantity of coal loaded through Lidsdale Siding and to provide for greater efficiency and reliability.

The Project would enable a number of environmental improvements to be made that would not otherwise be undertaken. For example, stockpile management and coal loading currently requires extensive use of trucks and front end loaders that generate noise and dust. The Project would remove the need for the majority of on-site use of such vehicles by installing an automated train loading system and managed stockpile arrangement .The Project also enables the removal of coal trucks on the public road network.

The objectives of the Project are as follows:

- to significantly reduce the need for mobile plant and equipment to load rail wagons and for stockpile management
- to reduce the operating costs on a per tonne basis
- to minimise environmental impacts such as noise and dust from stockpile and loading operations
- to provide access to the export market for production capacity from the local area above future domestic sales
- to assist in the provisioning and storage of rolling stock and locomotives required for coal transport to port.

4.3 Overview

Centennial is proposing to upgrade the existing Lidsdale Siding rail loading facility by automating the transfer of coal from the existing overland conveyor onto trains. The Project would require the construction of above and below ground facilities, including a stockpile conveyor, an extension and duplication of the existing rail siding, loading bin, new above and below ground conveyor, and upgrades to the water supply and water reticulation systems and power supply. The main components of the Project are shown on **Figure 4**.

The Project would eliminate the need for front end loaders to load trains which is anticipated to provide environmental benefits, particularly with the reduction in noise and dust generation. Mobile equipment would still be required for stockpile management however the overall use of mobile plant on site would be significantly reduced. The main physical components of the Project are:

- a new diversion chute at the end of the existing overland conveyor to load coal onto the stockpile conveyor. This chute can also divert coal to an auxiliary stockpile under unplanned stop conditions for the stockpile conveyor so that the overland system does not need to be shutdown
- an elongated conical stockpile and associated push out area
- an auxiliary stockpile for the diversion of coal from the conveyor system

- an elevating stockpile conveyor and gantry to feed the existing coal stream to the elongated conical stockpile
- underground tunnel with reclaimers beneath the elongated conical stockpile
- a train loading bin incorporating coal weighing (nominal 250 tonne capacity)
- a conveyor from the reclaim tunnel to the train loading bin
- a spillage reclaim pit beneath the train loading bin
- a control room adjacent to the loading bin
- a track extension to the existing rail siding with additional parallel siding
- water supply, dust suppression, reticulation upgrade and water management structures as required
- landscaping and bunding as required
- a new transformer to upgrade power
- lighting for night operation and security
- erection of perimeter fencing and signage
- storage infrastructure
- mobile refuelling facility and the provision of a self bunded transportable fuel tank near the rail loading bin.

The following operations of the Project are:

- processing of increased quantity of coal from 2 million to up to approximately 6.3 million tonnes per annum (Mtpa)
- all coal would be delivered by the existing overland conveyor system
- increased train movements from two to an average of five per day and a peak of seven trains per day
- increased rate of operation of the existing conveyor from the Centennial Coal Services Site and operation of this, the feeder and the proposed reclaimer
- blending of coal on site
- weighing of wagons
- railyard activities, being storage, provisioning and minor maintenance of locomotives and wagons normally accessing the site for loading
- maintenance of onsite infrastructure and site amenities
- maintenance and inspection of on-site machinery including locomotives and rolling stock
- fuelling of onsite machinery, including locomotives from mobile tankers and a self bunded transportable fuel tank
- environmental management measures including sprinkler use for dust suppression, truck wash, monitoring activities, waste removal and noise attenuation.
- Use of the existing weighbridge.

As a result of the Project approval Lidsdale Siding will have improved coal handling capabilities and increased throughput. Total exports would increase to up to approximately 6.3 Million tonnes per annum (Mtpa) however all coal would be delivered via the existing overland conveyor system.

4.4 Project Description

The physical components of the Project are identified on **Figure 4** – Project Components Plan and also described below.

4.4.1 Coal Receival

Coal received to the site would be via the existing overland conveyor at a varying feed rate up to 900tph representing the design capacity of the conveyor but which has historically operated at a lower rate matching the previous export capacity of the Siding. The amount of coal received to the site via this conveyor would be up to approximately 6.3 Mtpa, operating under the current conditions of 24hrs/day, 7 days/week.

A new coal transfer point would be constructed at the end of the Overland Conveyor from the Centennial Coal Western Coal Services Site (herein referred to as OL2) to the new stockpile conveyor. This incorporates a new diversion chute which can divert coal to the auxiliary stockpile in stoppage events.

4.4.2 Coal Stockpiling

A new elevating conveyor from the OL 2 transfer tower would feed the overhead discharge conveyor and travelling tripper arrangement. This system would enable an elongated conical stockpile to be formed as well as specifically direct coal to the reclaim feeders during train loading. The overhead discharge conveyor would be approximately 30 metres high and 40 metres long. The extended conical stockpile would have a capacity of approximately 50,000 tonnes, with an approximate height of 28 metres, 120 metres long and 60 metres wide with additional push out area. The conical stockpile would comprise the main storage of coal, while the push out area would be used as required for maintenance and operational contingency. The new conveyors would include a covered gantry and walkway. The main stockpile would be replenished, as required on a 24 hour basis.

A second stockpile, referred to as an auxiliary stockpile, would be located adjacent to the transfer tower and formed when required. In the event that coal from the OL 2 conveyor cannot be loaded onto the coal handling facilities at the Siding, the diversion chute would divert coal to the ground. This is a safety feature that would enable the OL2 conveyor, which also takes raw coal from the Springvale Mine to the Centennial Coal Services Site, to continue to operate should a problem arise in the system. When required, the auxiliary stockpile can cater for a full OL 2 (return strand) conveyor load of coal. The auxiliary stockpile would be temporary and the coal reclaimed by mobile plant.

4.4.3 Coal Conveying from Stockpile to Rail Bin

Coal would be drawn down from the full elongated conical stockpile into the reclaim tunnel, via four reclaimers, positioned to maximise the live draw down potential of the stockpile, in sufficient quantity to fill up to three trains without mobile plant feeding the reclaimers. The base of the proposed reclaim tunnel would be approximately 4 metres below ground. The tunnel would be approximately 150 metres in length and 5.5 metres wide.

Coal would be delivered to the bin feed conveyor via four stockpile dischargers and then conveyed at a rate of up to 3,800 tph to the rail bin. The rail bin would have an operational capacity of around 250 tonnes and be approximately 30 m high. Coal would be pushed to the feeders as required if there is insufficient capacity in the ‘live’ portion of the stockpile while the stockpile conveyor would be positioned to direct coal to a feeder further maximising the live reclaim capacity.

The ground conveyor from the reclaim tunnel to the train loading bin would rise to an enclosed head chute above the train loading bin.

Coal conveying from stockpiles to the bin would be required prior to and during train loading operations, which would occur seven days a week, 24 hours a day.

4.4.4 Train Loading

Trains would be loaded automatically, in a continuous operation as the train propels to the western end of the siding away from the bin. Coal feed to the wagons, from the bin would be via a hydraulically operated guillotine gate at the base of the cone of the bin. The train loading bin includes noise attenuation barriers. Operation of the infrastructure would occur, as required, seven days a week, 24 hours a day including the use of existing rail and associated rail infrastructure.

Any spillage occurring during this operation would be contained in a pit beneath the rails which can be accessed by a small front end loading machine for cleaning from time to time. Monitoring would also be installed, to detect spillage as it occurs, so that loading operations can be stopped for track cleaning if required. Each train would take between 1 and 1.5 hours to load.

4.4.5 Coal Dispatch

Coal would be transported from the site via the rail network, requiring access 24 hours a day, seven days per week. The average frequency would be five trains per day with a peak of seven trains per day, at a nominal net tonnage of up to 3,800 per train. No coal would be transported by road.

4.4.6 Weighing

Load weights would be measured and recorded electronically at the rail bin. The existing weighbridge would remain in operation although coal transport to the site would no longer be required. Trucks (eg delivery trucks) would be weighed, where necessary, on entry and exit from the site at the existing weighbridge.

4.4.7 Track Extension

The existing rail siding would be reconstructed on a new formation, re-aligned and extended by approximately 260 metres to the south-west. Minor cut and fill earthworks would be required adjacent to the creek and in Lot 1 adjacent to Bray's Lane. There would also be a parallel rail line adjacent to the existing and extended section of track to provide a parallel siding. As described in Section 4.6, there may also be a need to construct a new line adjacent to the existing Wallerawang Spur line to accommodate the proposed Pine Dale development.

4.4.8 Water Management Structures

The existing pollution control ponds operating at the Siding comply with the requirements under the publication "Managing Urban Stormwater: Soils and Construction, Volume 1 (Landcom, 2004)" and additional criteria specified in the publication "Managing Urban Stormwater: Soils and Construction, Volume 2E – Mines and quarries (DECC, 2008)". Some minor improvements however are proposed which would include:

- Additional drainage provisions along the existing and extended rail line as well as the proposed shunt line to ensure all dirty water is captured and treated within the existing pollution control system while clean water is directed offsite.
- Cleanup of any spilt coal on the northern side of the rail siding and ensure that this area remains free of coal material.

- Improved clean water diversion channels and drains to ensure runoff from other areas such as Main Street and other private properties is directed around the site.
- Improving the flood flows within Pipers Flat Creek adjacent to the Siding by removal of Willows and creek obstructions.

4.4.9 Landscaping and Bunding

As part of the Project it is proposed to plant a tree screen generally at the western end of the siding to screen views of the rail line from residences and businesses of Wallerawang. Screening is currently provided by mature Willow trees however these would need to be progressively removed in line with appropriate catchment management principles. The opportunity also exists during the construction phase to assist with visual screening by the use of excess fill to form bunding. Any material generated during the construction program would be tested for contaminants prior to use in landscaping works. The general location of the proposed landscaping works is provided in **Figure 4**.

4.4.10 Support Facilities

The Project involves minor upgrading of the existing services and control systems on site. There would be a control room located beside the train loading bin which would house telecommunications and control systems for the travelling tripper on the stockpile feed conveyor, underground feeders and train loading bin. This system would also enable control functions to be integrated with the Coal Services facility to the north which provides communication systems for the overland conveyors, Washery and coal handling infrastructure.

Power supply to the facility would be improved by replacing the existing transformer and upgrading the site reticulation. Mains power to the site is currently being upgraded and would not require augmentation.

The existing security fencing around the site will be extended. Some additional signage would also be installed in line with current *Work Health and Safety Act 2011* requirements. New lighting structures are also proposed for night operation and site security. These would be located above the stockpile mounted on the overhead gantry and pointed towards the stockpile as well as the train loading bin. Walkway lighting would be provided and used when required for access at night.

4.4.11 Coal Receivals: Changes to Operation of Existing Overland Conveyor

Up to approximately 6.3Mtpa of coal would be transported to the site via the existing overland conveyor. The approximate 6.3Mtpa throughput represents the available capacity of the existing overland conveyor which can deliver up to 900tph. The conveyor would operate 24 hours a day, seven days a week as it does currently. Although the site has a history of coal deliveries by road, it is now proposed to only deliver coal via the existing overland conveyor system.

4.4.12 Coal Stockpiling: Stockpile Size and Changes to Stockpile Management

The existing operation involves a small stockpile formed at the base of the OL2 conveyor which is loaded onto trucks and dumped in a large stockpiling area adjacent to the rail siding. From here the coal is loaded into trains by front end loader. This large stockpile area is also used by trucks transporting coal to the site from the public road network. The proposed automated coal loading system would remove this manual double handling of coal by mobile plant as well as remove the truck haulage of coal on the public road network.

Overall the stockpile capacity of the site would remain the same however with the proposed new stacking reclaim system, the area required for coal storage would be reduced. The existing conical stockpile beneath the OL2 conveyor would be removed as would the manual process of trucking this coal to the existing stockpiling and loading area adjacent to the rail line. There would also be provision for an auxiliary stockpile created by a diversion chute at the end of OL2. This would be used only if required and the coal removed by mobile plant. This stockpile would be small and would take the remaining coal from the OL2 conveyor in the event of mechanical failure or other unplanned shutdown of the coal handling system or diverted coal in the event of system overrun.

Mobile equipment would be required for stockpile management as well as forming the push out storage area. Pushing operations and general stockpile management operations (including movement from the auxiliary stockpile) would be maximised during daylight hours but would be required during the evening and night on an "as required" basis to ensure coal feed to the train loading operations. Night time stockpile operations are minimised by the capacity of live draw down at approximately 12,000 tonnes. The live storage above the feeders can also be selectively fed by the overhead discharge conveyor, giving the ability to load several trains without mobile plant managing the stockpile.

Blending of coal currently occurs on site by physically mixing coal of different qualities using a front end loader. In future, blending can occur via the overhead tripper conveyor or within the push out area.

4.4.13 Employment

The current operation employs up to 20 permanent staff, operators and contractors and other casuals. The upgraded facility would require a total workforce of 10 and therefore a reduction in jobs, predominantly contract equipment operators.

The construction workforce would vary with a peak of up to 100 people but with an average of less than 50 over the 12 to 15 month construction program.

4.4.14 Maintenance

The current operation includes general maintenance of mobile plant, infrastructure and site amenities. For the proposed upgrade, maintenance activities of a minor nature would be extended to include train locomotives and wagons. Normal train and rolling stock inspections would also be undertaken.

4.4.15 Refuelling and Storage Infrastructure

A mobile refuelling tanker is currently used on site to refuel mobile plant and train locomotives. This tanker brings in fuel from bulk suppliers and used at various locations around the site. The fuel tanker is a purpose built unit with Safe Load Program (SLP) Certification and all operators are SLP accredited. This operation would be continued as part of the proposed development.

The site recently removed an above ground diesel storage tank which will be replaced with a self bunded transportable fuel tank with a pump bay and dry break nozzles (to reduce spillage) located near the rail loading bin.

4.4.16 Environmental Management Measures

The current operation includes a range of environmental management and control systems covering dust, noise and surface water. As part of this assessment, the existing controls were assessed and found to be adequate. The Project will require minor modifications to the existing management systems, particularly in relation to dust and noise management controls. These include the incorporation of dust suppression sprays on the overhead tripper conveyor, transfer tower and water cannons available on the push out stockpile area.

Noise controls include noise specifications for new plant and equipment and barriers at the train loading bin. Visual controls would be provided by constructing a landscape bund between the western end the siding and residences and commercial operations on the outskirts of Wallerawang.

Current environmental monitoring provisions, which include a weather station, monthly dust readings, water sampling during discharge and regular noise monitoring will continue.

4.5 Construction Activities

It is anticipated that construction would commence in December 2012 and will take up to 12 months. The intention is for the site to be fully operational by December 2013.

The main construction activities that would be undertaken as part of the Project include:

- Earthworks
- Concreting
- Infrastructure modification and installation
- Extension of existing, and laying of additional track.

Earthworks would be undertaken for the following aspects of the Project:

- Foundation work
- Stockpile and reclaim tunnel construction
- Spillage Pit construction
- Drainage and erosion and sediment control
- General site profiling
- Trenching for pipes and cables.
- Foundation for track

Concreting would be undertaken for the following aspects of the Project:

- Foundation work
- Stockpile, pad and reclaim construction

Infrastructure modification would include changes to the head arrangement of the existing conveyor to provide a chute to divert product at the head when required. The surface infrastructure to be constructed would comprise the following:

- a stacking conveyor and gantry for the formation of a 50,000 tonne stockpile
- a reclaim tunnel beneath the normal ground level, equipped with four stockpile dischargers
- a bin feed conveyor

- a nominal 250 tonne bin and spillage pit
- electrical distribution requirements, including a switch room and a control room.

Installation of this infrastructure would require the use of a crane, welding, grinding, working at height and the transport of oversize loads to the site.

The construction program will need to be undertaken while the Siding is operating. As the Siding operates 24 hours per day, 7 days per week, and needs to continue to do so during the construction period, some construction activities will need to occur outside normal construction hours. However activities that may generate noise above normal operating noise levels will be conducted during daylight hours 7am to 6pm on Mondays to Fridays, and 8am to 1pm on Saturdays.

4.6 Interactions with Pine Dale Stage 2 Extension Project

Enhance Place Pty Limited is proposing to further develop the Pine Dale Mine which is located approximately three kilometres north of the Project Site. It is likely that further development of the Pine Dale Mine will involve transporting a component of production to Lidsdale Siding by rail. In order to accommodate this potential, rail duplication and / or realignment in the northern end of the Project Site is likely. Hence this EA has included environmental studies covering the northern section of the existing line in the event that a separate parallel line, or realignment needs to be constructed.

4.7 Rehabilitation

The life of the Project Site is dependent on the export needs of several coal mines in the district. Once these mines close, currently anticipated to be in around 30 years, there may well be other uses for a rail siding in the district. These options would need to be explored with the land owners (NSW State Government) prior to final rehabilitation of the site. Should no further use of the Project Site be found, the site would be closed, decommissioned and rehabilitated. This would include:

- Removal of the rail spur line and shunt
- Removal of all infrastructure
- Removal of carbonaceous and contaminated materials.
- Filling the reclaim tunnel and other physical features of the siding.
- Rehabilitation of the remaining disturbed areas.

There are several alternative land uses that the site would be suitable for including industrial, commercial, residential or natural habitat. At the time of final closure, these alternative land uses would be further investigated prior to rehabilitation works commencing following consultation with the owners of the site.

4.8 Likely Interactions between Existing and Approved Mining Operations and the Project

The Project forms part of a regional review of coal logistics for Centennial. Coal exported through Lidsdale Siding would include all coal originating from the Centennial Coal Services site which is located three kilometres north of the Project Site. The upgrade of the Centennial Coal Services site is the subject of a separate State Significant Development application.

5.0 Planning Context

5.1 Commonwealth Legislation

5.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC).

Under the EPBC Act, approval by the Environment Minister is required for proposed 'actions' that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. Matters of national environmental significance of potential relevance to the project include Commonwealth listed threatened species and ecological communities, and migratory species.

Potential impacts of the Project on flora and fauna are summarised in Section 8.4 and are based upon the Ecological Assessment, prepared for the Project Site and broader study area, as contained in **Appendix 12**. The Assessment concluded that the Project will not impact on matters of national environmental significance. The Project Site is not in a world heritage area; is not a national heritage place; contains no Ramsar wetlands of international importance nor a Commonwealth marine environment; the proposal is not a nuclear action one nor does it have a significant impact on migratory species listed in the EPBC Act or threatened species or ecological communities listed in the EPBC Act. Therefore, referral to SEWPaC is not required.

5.1.2 National Greenhouse and Energy Reporting Act 2007

The *National Greenhouse and Energy Reporting Act 2007* (NGER) provides a single National framework for the reporting and dissemination of information regarding greenhouse gas emissions, greenhouse gas projects and energy use, and production by corporations. The NGER Act mandates registration and reporting by corporations whose energy production or use, or greenhouse gas emissions meet specified thresholds. Centennial reports emissions from the corporation which includes emissions from the Lidsdale Siding. Further information relating to energy used and greenhouse gas emissions is contained in Section 8.4.6 of this EA.

5.1.3 Native Title Act 1993

The *Native Title Act 1993* recognises that Aboriginal people have rights and interests to land which derives from their traditional laws and customs. Native title rights can include rights to: live on the land, access the land for traditional purposes, protect important places and sites, collect food and medicinal resources from native plants, hunt and fish, teach traditional law and customs, and to have input into land use practices and development planning. Native title can be negotiated in two ways; through a Native Title Claim (applications and determinations), or through an Indigenous Land Use Agreement (ILUA).

An ILUA is an agreement between a native title group and other parties who use or manage the land and waters. The ILUA process allows for negotiation between indigenous groups and other parties over the use and management of land and water resources, and the ability to establish a formal agreement. An ILUA is binding once it has been registered on the Native Title Tribunal's Register of Indigenous Land Use Agreements.

5.2 NSW State Legislation

5.2.1 Environmental Planning and Assessment Act 1979

On 1 August 2005, Part 3A of the EP&A Act commenced. Part 3A and its accompanying Regulations and Guidelines contained the assessment and determination framework for major projects including mining projects.

The Minister formed the opinion on 7 July 2011 that the development to which this application relates was a project to which Part 3A of the EP&A Act applied.

Hence this Environmental Assessment has been prepared to support an application for Project Approval under Part 3A of the EP&A Act. Whilst Part 3A was repealed on 1 October 2011, revised Director General's Requirements (DGRs) for the EA were issued prior to this date on 7 July 2011. As such, the project constitutes a "transitional Part 3A project" under Schedule 6A of the EP&A Act. Part 3A continues to apply to transitional Part 3A projects, including this project, in accordance with the transitional provisions set out in Schedule 6A of the EP&A Act. A second revised version of the DGRs for the EA was issued on the 31st January 2012.

Section 75R of the EP&A Act provides that environmental planning instruments (other than State environmental planning instruments) do not apply to an approved project. Section 75J(3) of the EP&A Act provides that the Minister may, but is not required to, take into account the provisions of an environmental planning instrument that would not apply to the project (because of Section 75R) if approved. However, the regulations may provide that the Minister is precluded from approving a project that such an environmental planning instrument would otherwise prohibit.

Sections 75U of the EP&A Act relevantly provides that the following authorisations are not required for an approved project:

- an approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*
- an Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974*
- an authorisation referred to in section 12 of the *Native Vegetation Act 2003* (or under any Act to be repealed by that Act) to clear native vegetation or State protected land
- a water use approval under section 89, a water management work approval under section 90 or an activity approval under section 91 of the *Water Management Act 2000*.

5.2.2 Environmental Planning and Assessment Regulation 2000

Clause 8O of the EP&A Act Regulations provides that the Minister is precluded from approving a project that would be prohibited by an environmental planning instrument that (because of section 75R of the Act) would apply to the project if approved. For the reasons explained above, this clause is not enlivened with respect to the project.

5.2.2.1 Ecologically Sustainable Development (ESD)

Ecologically Sustainable Development (ESD) has emerged as a primary objective of environmental protection in NSW. ESD is an objective of the EP&A Act under Section 5(a)(vii) and is defined under Section 4 of the EP&A Act as having the same meaning as Section 6(2) of the Protection of the Environment Administration Act 1991 being:

> *6(2) for the purposes of subsection (1)(a), ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the*

implementation of the following principles and programs:

(a) the precautionary principle—namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation...

(b) inter-generational equity—namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

(c) conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

(d) improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services….

The overall objectives of ESD are to use, conserve and enhance natural resources. This ensures that ecological processes are maintained facilitating improved quality of life, now and into the future.

Centennial has shown a commitment to the principles of ESD and understands that social, economic and environmental objectives are interdependent. Centennial acknowledges that a well designed and effectively managed operation would avoid significant and/or costly environmental impact or degradation. The existing EPL and the existing environmental management plans have been developed to appropriately identify, mitigate and manage environmental risk. These demonstrate environmental due diligence and provide procedures for on-going management and monitoring of the operation in line with the objectives of ESD.

5.2.2.2 The Precautionary Principle

The Precautionary Principle, in summary, holds that where there are threats of serious or irreversible environmental damage, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

A precautionary approach has been employed to prevent or minimise impacts. A risk assessment was undertaken to identify potential impacts and a preliminary review of impacts and potential mitigation measures has been undertaken prior to finalisation of the proposed project and completion of the assessment.

A detailed understanding of the issues and potential impacts associated with the Project has been obtained via consultation and assessment to a level of detail commensurate with the scale of the Project, industry standards and the legislative framework under which the Project is permitted. Specialist assessments, including the use of engineering and scientific modelling, have been undertaken for the design of the Project for impacts relating to terrestrial and aquatic ecology; traffic and transport; air quality and greenhouse gas; noise and vibration; heritage; soil, land and agriculture; contamination; groundwater; surface water and flooding; visual; social and economic considerations. To this end, there has been careful evaluation undertaken in order to avoid, where possible, serious or irreversible damage to the environment.

5.2.2.3 Social Equity, Inter-Generational Equity

Intergenerational Equity is centred on the concept that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. There is a moral obligation to ensure that today's economic progress, which will benefit both current and future generations, is not offset by environmental deterioration.

The primary objective of the Project is to significantly improve the efficiency of the existing operation. The various consultation activities that have been undertaken and the engagement of suitably qualified and

experienced consultants have ensured that the planning, design and environmental assessment phases of the Project have been transparent. The contents of this EA report (including appendices), combined with the consultation activities, has enabled Centennial to understand the potential implications of the Project and therefore identify the required management strategies, mitigation measures and monitoring activities to ensure potential for impact is appropriately minimised.

The management strategies, mitigation measures and monitoring programs have been identified to minimise adverse impact upon the local environment and the nearby communities. Emphasis has been placed on anticipation and prevention of potential impacts, as opposed to undertaking later remedial action.

5.2.2.4 Conservation of Biological Diversity and Ecological Integrity

The principle of Conservation of Biological Diversity and Ecological Integrity holds that the conservation of biological diversity and ecological integrity should be a fundamental consideration for development proposals.

The potential environmental impacts of the Project, including upon ecological communities and habitat values, and measures to ameliorate these potential impacts are detailed within this EA. Centennial has sought to avoid and minimise potential impacts on ecological values through a risk based approach.

5.2.2.5 Improved Valuation and Pricing of Environmental Resources

The principle of Improved Valuation, Pricing and Incentive Mechanisms deems that environmental factors should be included in the valuation of assets and services. The cost associated with using or impacting upon an environmental resource is seen as a cost incurred to protect that resource.

Whilst clear and widely accepted standards have not yet been established for the application of this principle (to date there are few widely accepted methods by which monetary values are attributed to environmental factors), Centennial acknowledges and accepts the financial costs associated with all the measures required for the facility to avoid, minimise, mitigate and manage potential environmental and social impacts for the Project.

5.2.3 Mining Act 1992

Although there is no mining lease associated with the Project Site, the Project is considered consistent with the objectives of the *Mining Act 1992.*

5.2.4 Heritage Act 1977

Historical archaeological relics, buildings, structures, archaeological deposits and features are protected under the *Heritage Act 1977* and may be identified on the State Heritage Register (SHR) or by an active Interim Heritage Order. Certain types of historic Aboriginal sites may be listed on the SHR or be subject to an active Interim Heritage Order; in such cases they would be protected under the *Heritage Act 1977* and might ordinarily require approvals or excavation permits from the NSW Heritage Branch. However, Section 75U of the EP&A Act provides that such approvals or permits are not required for a project approved under Part 3A.

A search of the NSW State Heritage Inventory (accessed 17th January, 2012) in the area of Wallerawang, carried out as part of the Cultural Heritage Assessment contained in **Appendix 14**,identified a number of Heritage items outside the Project Site and broader study area. The nearest item of heritage significance is the St John Evangelist Church located on Main Street and some 600 metres away from the Project Site. The Cultural Heritage Assessment concludes the Project Site is well removed from any Heritage Items and therefore the Project will have no impact upon them.

5.2.5 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) is designed to conserve and protect threatened species, populations and ecological communities.

Threatened flora and fauna species (listed under the TSC Act) that have been gazetted and recorded within a 10km radius of the site have been considered within the Ecological Assessment contained in **Appendix 12**. Endangered Ecological Communities (EECs) known from the broader area have also been addressed. Each species/community is considered for its potential to occur on the site and the likely level of impact as a result of the proposal. The Assessment deals with each species/community separately and identifies the ecological parameters of significance associated with the proposal.

Those species/communities that have been identified as having potential to be impacted by the Project have been subject to further assessment under the 7 Part Test outlined in the TSC Act. The Assessment concluded that the Project will not have a significant impact on threatened flora, threatened fauna or endangered ecological communities that are known or expected to occur therein.

5.2.6 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is administered by the Environment Protection Agency (EPA). The POEO Act relevantly provides that an Environment Protection Licence (EPL) is required to authorise certain "premises based activities" listed in Part A of Schedule 1 to the Act. Lidsdale Siding operates under EPL 5129 which authorises the carrying out of "coal works" at the premises. EPL 5129 imposes a range of environmental protection conditions including conditions regulating waste generation and disposal; and water, air, and noise pollution. A variation to EPL 5129 will be sought so as to authorise any increase or change in waste generation and disposal; or water, air or noise pollution arising as a result of the Project.

5.2.7 Water Management Act 2000 and Water Act 1912

The *Water Act 1912* and *Water Management Act 2000* contain provisions for the licensing of water capture and use. In general, the provisions of the *Water Act 1912* continue to apply in an area unless a Water Sharing Plan under the *Water Management Act 2000* for that area has commenced. As no such Water Sharing Plan has commenced in the Project Site or the broader study area, it is the provisions of the *Water Act 1912* that are relevant to the project with respect to potential licensing requirements.

The Project will require a temporary water access licence during the construction period for the purposes of removal of any groundwater which enters the excavation required for the reclaim tunnel. The licence falls under the *Water Act 1912*, administrated by NSW Office of Water. This particular licence will not be required once construction is complete as the reclaim tunnel will be concrete lined and no longer intercepting groundwater.

5.2.8 State Environmental Planning Policies

5.2.8.1 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP) lists development that is complying, exempt and requiring approval. The aims of the SEPP are stated in Clause 2 as follows:

> *In recognition of the importance to New South Wales of mining, petroleum production and extractive industries:*

(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and

(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and

(c) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources.

Clause 7 -Development permissible with consent, relevantly states that:

(1) Mining - Development for any of the following purposes may be carried out only with development consent:

(a) mining carried out:

(i) *on land where development for the purposes of agriculture or industry may be carried out (with or without development consent)*

(d) facilities for the processing or transportation of minerals or mineral bearing ores on land on which mining may be carried out (with or without development consent), but only if they were mined from that land or adjoining land …

The definition of "mining" set out in Clause 3 of the Mining SEPP includes "the stockpiling, processing, treatment and transportation of materials extracted".

Clause 5 of the Mining SEPP relevantly provides that, to the extent that any of its provisions are inconsistent with the provisions of a local environmental plan, the provisions of the Mining SEPP prevail to the extent of the inconsistency. The interaction of the Mining SEPP with the *Lithgow City Council Local Environmental Plan 1994* is discussed further in Section 5.2.9.

5.2.8.2 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

The DoPI via review of the PEA is satisfied that the Project did not comprise potentially hazardous or offensive development and was generally consistent with the aims, objectives and requirements of SEPP 33. The Project will not introduce any new activities that would r result in it comprising hazardous or offensive development.

5.2.8.3 State Environmental Planning Policy No. 44 – Koala Habitat Protection

The Project Site is located within Greater Lithgow local government area which is listed within Schedule 1 of State Environmental Planning Policy 44 (SEPP 44) – 'Koala Habitat Protection'. Therefore SEPP-44 applies to the land.

Schedule 2 of SEPP 44 – 'Koala Habitat Protection' lists 10 tree species that are considered indicators of 'Potential Koala Habitat'. The presence of any of the species listed on a site proposed for development triggers the requirement for an assessment for 'Potential Koala Habitat'. SEPP 44 defines potential Koala Habitat as:

"areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component".

No “Schedule 2” feed tree species were recorded within the Project Site or the broader study area, therefore the Project Site and broader study area does not constitute Potential Koala Habitat and no further provisions of this policy apply.

5.2.8.4 State Environmental Planning Policy No.55 – Remediation of Land

State Environmental Planning Policy 55 (SEPP 55) - Remediation of Land, regulates contamination by requiring all consent authorities to consider any contamination when deciding a development application. A contamination investigation undertaken at the site in 2009 which was updated in 2012 as part of this EA, refer to Section 8.4.6 and **Appendix 6**, concluded that the site was suitable for the Project however further investigation will be conducted to ensure that the hydrocarbon contamination detected on site does not migrate offsite. There is no evidence of contamination resulting from previous land uses on site have migrated off site. Centennial has advised the NSW Environment Protection Authority that a separate management plan will be developed and remediation works undertaken as required within the next five years.

SEPP 55 has relevance to the Project in relation to the potential for construction activities to disturb a previously unidentified area of contamination and a requirement for a preliminary land investigation has been identified within the key issues in the DGR’s. However, given the history of the site and the level of surface and subsurface investigation, it is considered unlikely that there are any areas of unknown contamination on site. The construction program will provide some opportunities to remediate areas identified as containing hydrocarbon contamination.

5.2.8.5 State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011

The State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 requires that all new proposed development in the Sydney drinking water catchment demonstrates a neutral or beneficial effect (NorBE) on water quality. To achieve optimal or maintain current water quality in the catchment, the Healthy Catchments Strategy 2009-2012 was developed. The Strategy includes the development of annual Healthy Catchment Programs to assist in meeting water resource objectives. A NorBE test is identified below.

A neutral or beneficial effect on water quality is satisfied if the development:

(a) has no identifiable potential impact on water quality, or

(b) will contain any water quality impact on the development site and prevent it from reaching any watercourse, waterbody or drainage depression on the site, or

(c) will transfer any water quality impact outside the site where it is treated and disposed of to standards approved by the consent authority.

A NorBE assessment in relation to the Project is addressed within **Table 3**.

Table 3: NorBE Test – Lidsdale Siding

Assessment Tool	Comment
a. Site considerations	The Project Site is situated in the Upper Coxs River Subcatchment, which is within the Blue Mountains Western Catchment managed by the Hawkesbury-Nepean Catchment Management Authority (HNCMA). The Project Site is located south of the Coxs River and Pipers Flat Creek confluence.
b. Assessment of stormwater impacts	A number of smaller tributaries feed into the aforementioned River and Creek, which have headwaters in state forest or cleared private land.

Assessment Tool	Comment
c. Assessment of wastewater impacts	The Upper Coxs River Subcatchment forms part of the Warragamba Water Supply System, which is within the Sydney Metropolitan Drinking Water Catchment. The agricultural suitability classification of the Project Site and broader study area is Class 5. This class of land is marginal land not suitable for cultivation and has very low potential for grazing production.
d. General considerations and assumptions	The SCA's Healthy Catchments Strategy 2010-12 presents a number of protection activities for the area to address risks to water quality. Priority risk drainage areas, one of which contains the Project Site, are mapped and have intervention activities allocated to them. The priority issues in regards to water quality for Pipers Flat Creek in the vicinity of the Project Site are grazing, roads, urban stormwater and the Wallerawang Sewage Treatment Plant.

5.2.9 Lithgow Local Environmental Plan 1994

The Project Site is located within the Lithgow City local government area. Under the provisions of the *Lithgow Local Environmental Plan 1994* the majority of the Project Site is zoned Rural (General) 1(a). Two small areas adjacent to the northern part of the Wallerawang township are zoned Village 2(v). A plan showing the existing land use zones as extracted from the *Lithgow Local Environmental Plan 1994* is shown in **Figure 5.**

The objective of the Rural (General) 1(a) zone is as follows:

The objective of the zone is to promote the proper management and utilisation of natural resources by:

- *(a) protecting, enhancing and conserving:*
  - (i) *rural land, in particular prime crop and pasture land, in a manner which sustains its efficient and effective agricultural production potential,*
  - (ii) *soil, by controlling and locating development in accordance with soil capability,*
  - (iii) *forests of existing and potential commercial value for timber production,*
  - (iv) *valuable deposits of minerals, coal and extractive materials, by controlling the location of development for other purposes in order to ensure the efficient extraction of those deposits,*
  - (v) *trees and other vegetation in environmentally sensitive areas, where the conservation of the vegetation is significant for scenic amenity or natural wildlife habitat or is likely to control land degradation,*
  - (vi) *water resources for use in the public interest, preventing the pollution of water supply catchment and major water storages,*
  - (vii) *localities of significance for nature conservation, including places with rare plants, wetlands and significant wildlife habitat, and*
  - (viii) *items of heritage significance,*
- *(b) preventing the unjustified development of prime crop and pasture land for purposes other than agriculture,*
- *(c) facilitating farm adjustments,*
- *(d) minimising the cost to the community of:*
  - (i) *fragmented and isolated development of rural land, and*
  - (ii) *providing, extending and maintaining public amenities and services,*

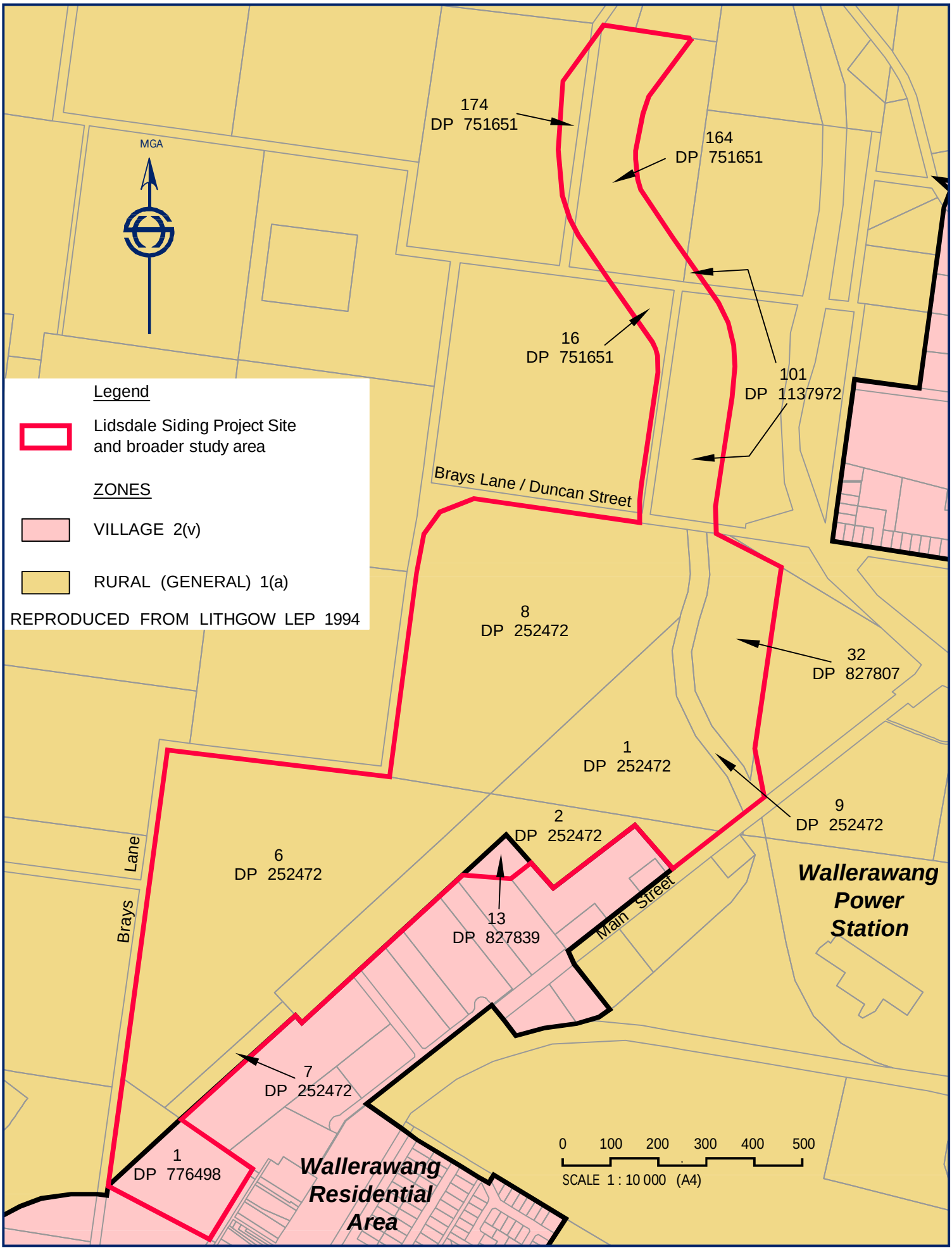

FIGURE 5

TITLE: **Lidsdale Siding Upgrade Project**
EXISTING LAND USE ZONE PLAN

LOCATION: WALLERAWANG

DATUM: (GDA 94)
PROJECTION: PROJECT AREA

DATE: 14TH AUG 2012
PURPOSE: ENV ASSESSMENT

CAD REF: **110912 Upgrades to Project Ar**
VERSION: Existing Land Use

CLIENT: CENTENNIAL COAL
JOB REF: 110912

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(e) providing land for other non-agricultural purposes, in accordance with the need for that development, and

(f) providing for the separation of conflicting land uses

While the Project is not directly responsible for the extraction of coal it does facilitate this process by providing for the efficient transportation of coal once it has been extracted. Under the Rural (General) 1(a) zone the Project would be permissible with development consent. It is important to note however that due to the Project being assessed under Part 3A of the EP&A Act, development consent from Council is not required.

As mentioned above some parts of the Project Site (a small section of the rail bin conveyor, the rail bin and part of the coal stockpile area) would be located within land zoned Village 2(v). While development for the purposes of mines is prohibited in this zone, development for the purposes of agriculture or industry is permissible with consent. For this reason, the prohibition against development for the purposes of mining in this zone is overridden by Clause 7 of the Mining SEPP which relevantly provides that such development is permissible with consent on land on which development for the purposes of agriculture or industry can be carried out.

As the Project is a project to which Part 3A of the EP&A Act applies the Minister for Planning will be the approval authority.

5.3 Lithgow Land Use Strategy

Lithgow City Council has prepared the Lithgow Land Use Strategy 2010-2030 (LLUS). This document has been exhibited and amended and finalised in accordance with Council's resolutions, and was forwarded to the NSW Department of Planning and Infrastructure for endorsement in late October 2011.

The LLUS is a combined Land Use Issues Paper and Strategy. It explores the issues that currently face the Lithgow LGA and recommends a new planning approach to address these issues. The Strategy will be implemented through the planning system, primarily through a new Local Environmental Plan and Development Control Plan, as well as Council's other policy, regulatory and governance functions.

This Strategy is significant to Council and the community because it will set directions and policy for the LGA's settlement and land use management for the next 20 years. The Strategy will be reviewed throughout this period every five years to ensure that its findings and recommendations remain relevant, are in keeping with sound planning principles and are continuing to meet the needs and expectations of the community.

In relation to the Wallerawang and Lidsdale area the LLUS states the intention to replace the broad 2(v) Village zone which currently exists over Wallerawang with more appropriate zoning (Residential, Commercial, Rural and Industrial) in recognition of current and future land use in the area. It is assumed that an opportunity for this action to occur will be during the preparation of a Council driven review of the local government wide local environmental plan.

6.0 Consultation

The Project was first raised with the NSW Government and community stakeholders in 2008. Liaison continued during 2009 and early 2010 however the project was delayed to allow for further options evaluation. The consultation program was recommenced in mid 2011 and will continue throughout 2012 while the Project is evaluated and assessed by government. The liaison process forms part of a Stakeholder Engagement Plan which will continue during the construction and operation of the Project. The following sections detail the framework of the engagement program and consultation activities to date.

6.1 Stakeholder Engagement Plan

Centennial has developed and implemented a Stakeholder Engagement Plan for the Lidsdale Siding Project. The Plan identifies relevant government and community stakeholders, the methods of engagement and the desired outcomes. It is recognised that effective engagement is a key deliverable for the project and forms an integral part of the ongoing operation of the project.

Centennial recognises that community engagement goes beyond making information available or gathering information about opinions or attitudes, rather it is about active exchanges of information and viewpoints. These exchanges provide an understanding of the community's needs, issues, values and aspirations which is required not only to assess the social impacts of the project but to maintain effective long term working relationships. These relationships are integral to Centennial's approach to business and its corporate Sustainable Development Strategy.

Similarly, effective relationships with government agencies form part of the Stakeholder Engagement Plan. Each agency has been separately recognised and their information requirements identified.

6.2 Community Consultation

The first community newsletter informing the local community of the Project was circulated in February 2009. This newsletter provided a background to the Project and outlined the environmental studies that would be undertaken as part of the application to the Department of Planning and Infrastructure.

The newsletter also provided details of a community information evening to be held where local residents or those interested in the Project could attend to find out further details. The contact details of Centennial Coal's Project Manager and Regional Environmental Officer were also provided.

The first community information evening was held at the Wallerawang Country Women's Association Hall on 24 February 2009 between 4.30pm and 8.00pm. Members of the community were able to view static information displays of the Project and ask questions of Centennial staff. The main issues raised in this initial session involved noise and dust impacts from the future operations.

The consultation was expanded in early 2012 in conjunction with other Centennial projects (Coal Services Upgrade, Springvale Mine and Angus Place Colliery developments). This comprised:

- A letter box drop of leaflets during early March 2012 inviting the regional community to Community Information Sessions;
- An article placed in the Lithgow Mercury, in Centennial's Local Lithgow Project Update to provide the regional community with an update on the four projects in the area
- Further project updates in the Lithgow Mercury advertising the three forthcoming Community Information Sessions
- A further advertisement placed in the Lithgow Mercury on 17 March 2012.

Community Information Sessions were subsequently held at the Country Women's Association in Wallerawang on:

- Wednesday 14 March 2012 , evening session from 4pm to 8pm
- Saturday 17 March 2012, morning session 9am to 1pm
- Tuesday 20 March 2012, morning session 9am to 1pm

Centennial representatives from all four projects were present at all three sessions. Information boards with project plans and illustrations were on display. The sessions were then reported in an article in the Lithgow Mercury on 21 April 2012.

Issues raised during the Community Information Sessions specifically regarding the Project included:

- Noise – there was a recognition that the removal of the reversing alarms on Front End Loaders was an improvement however night time loading was still audible, particularly the bell ringing when the trains crossed Main Street
- Wallerawang is still considered a "railway" town and there is a general acceptance of train noise
- The future elimination of truck deliveries were welcomed
- Length of time Brays Lane is blocked by trains. This was particularly a concern during the recent flooding which also blocked the Main Street end of Brays Lane.

Based upon community feedback there appears to be a general acceptance of the rail facility as an historic part of the town and the important role that coal mining plays in the district. The majority of residents attending the sessions understood the link between coal mining and ongoing prosperity but also expressed the desire to maintain environmental values of the region. The extension of the siding closer to the town was discussed but no specific issues or matters of concern were raised.

Issues raised by the community in relation to the wider regional developments included general visual impacts, particularly from open cut mining, intensification of mining activities and the recognition of impacts from sources other than Centennial Coal operations such as other mining operations and the two power stations.

6.3 Government Consultation

Consultation with government agencies commenced in June 2008 when the Project was first developed. As the Project progressed, a series of additional meetings were held in early 2012. The results of consultation thus far are provided in the following table.

Table 4: Consultation Schedule

Agency	Date of Consultation	Type or From/To	Topics	Issues Raised	Reference in Environmental Assessment/How Addressed
Department of Primary Industries/Forests NSW	28 February 2012	Presentation and meeting	Centennial presented each of the four projects, including this Project, to Forests NSW delegates.	Although the Project was raised in this meeting, no issues relevant to Forests NSW were raised.	N/A
Land and Property Management Authority (LPMA)	29 February 2012	Presentation and meeting	Centennial presented each of the four projects, including this Project, to LPMA	No specific issues relevant to the Project.	N/A
OEH DGR letter October 2008	Oct 2008	Letter from OEH	Threatened Species, Biodiversity and Cultural Heritage	Require identification of impacts on Threatened Species, EEC's and issues of Cultural Heritage. Identify impacts of water pollution (on and off site), water balance and handling of potential pollutants. Assess cumulative impacts. Describe mitigation and management options for all impacts and an assessment of the reliability of such options and any residual impacts.	Addressed in Section 8.4 Key Environmental Issues, Section 9 Statement of Commitments and Appendices 12 - 14.
OEH	2 March 2012	Presentation and meeting	Centennial presented each of the four projects to OEH delegates.	Issues relevant to the Project included existing noise and dust impacts and general assessment criteria for the operation.	Addressed in Section 8.4 Key Environmental Issues, Section 9 Statement of Commitments and Appendices 12 - 14.
DTIRIS (Division of Resources and Energy)	8 March 2012	Presentation/meeting and field inspection	Centennial presented each of the four projects to DTIRIS.	Although the Project Site is not covered by a Mining Lease, general rehabilitation requirements for environmental assessment were discussed. The Department's standard DGR's for Rehabilitation needs to be addressed.	Rehabilitation Plan for the Project Site has been prepared separate to this EA proposal.

Agency	Date of Consultation	Type or From/To	Topics	Issues Raised	Reference in Environmental Assessment/How Addressed
Sydney Catchment Authority (SCA) DGR letter October 2008	10 October 2008	Letter from SCA	Water quality impacts	Comprehensive assessment of impacts required. Demonstrate neutral beneficial effect on water quality from the site to receiving waters. Impacts on groundwater. Control of water from truck wash. Improved weed management. Soil and water management. Sustainability of systems and management measures over the long term	Addressed in Section 8.4 Key Environmental Issues, Section 9 Statement of Commitments and Appendices 4, 5 and 13.
SCA	2 March 2012 and 19 March 2012	Meeting and Field inspection	As part of the four Centennial projects, SCA visited Lidsdale Siding	Issues raised included general water management controls, cleaning up of the northern side of the rail siding, removal of Willows within Pipers Flat Creek, flooding issues and general sediment movement and controls on site. Need to undertake Neutral or beneficial effect assessment.	Addressed in Section 8.4 Key Environmental Issues, Section 9 Statement of Commitments and Appendices 4, 5 and 13.
Former Department of Water and Energy DGR letter October 2008	Oct 2008	Letter from DWE	Secure adequate water supply.	Demonstrate adequate and secure water supply. Identify site water demands and sources. Details of any water reticulation infrastructure.	Addressed in Section 8.4 Key Environmental Issues and Appendices 4 and 5.
NSW Office of Water	4 April 2012	Presentation and Meeting	Briefing on all four projects	Need to determine site water balance, determine sources of water, interaction with other water users and general discussion on water sharing plans and status. A coordinated approach is required between operators and agencies regarding the upper Coxs River Catchment	Issues addressed within Section 8.4 and further within Appendix 8.
Roads and Traffic Authority (RTA) DGR letter October 2008	October 2008	Letter from RTA	Traffic Study required	Traffic Study to include origin and destination of vehicles, projected growth for Castlereagh Highway, speed and fatigue management, train operations. Attention to safety and efficiency of level crossings and on site a parking.	Issues addressed within section 8.5.8 and further within Appendix 8.

Agency	Date of Consultation	Type or From/To	Topics	Issues Raised	Reference in Environmental Assessment/How Addressed
Roads and Maritime Service	28 February 2012	Presentation and Meeting	Specific briefing on Lidsdale Siding	Key issues related to rail crossings over Main Street and Brays Lane. ALCAM is the tool for assessment of rail crossings and control requirements. RMS considers that passive controls are generally not preferred for road/rail crossings. Preference for active controls such as lights and audible controls. RMS would need to signoff of construction traffic management plan.	Issues addressed within section 8.5.8 and further within Appendix 8.
Department of Planning and Infrastructure	Various since 2008	Discussions and correspondence	General briefing and DGR finalisation	Issues specific to EA preparation and assessment requirements as listed in DGR's	N/A
Lithgow City Council	16 April 2012	Presentation and meeting	Briefing on all four projects	General discussion regarding Voluntary Planning Agreement. No specific issues raised regarding the Project.	Refer to Section 5.

7.0 Identification of Key Environmental Issues

7.1 Introduction and Objectives

Centennial utilises a Risk Assessment process to identify environmental, safety and business risks to all its operations. This process involves its employees (and contractors where appropriate) identifying existing and recommending any necessary additional controls for all risks identified. The focus is on the inter-relationship between people, machinery, methods of work, the environment and the community.

Centennial has an Environmental Policy that clearly states that it values its role in sustainable development and aims to manage its business to achieve balanced environmental, economic and social aspects. The Policy states Centennial's commitment to minimising environmental impacts and to continual improvement in environmental management and performance. The key objective is to clearly identify the major project-related issues warranting detailed assessment in the Environmental Assessment.

7.2 Proposed activities with the Potential to Cause Environmental Impacts

The activities associated with the Project that have the potential to cause environmental impacts have been identified below:

- Noise emissions from operating the new plant and equipment
- Dust emissions from operating the new plant, equipment and operation of the new stockpiles
- Increased train movements, both loading and shunting within the site
- Track extensions and moving trains closer to the township of Wallerawang
- Visual impacts of the proposed new infrastructure, particularly the new loading bin and stockpile
- Surface water management and water supply
- Traffic implications including the two existing road crossings
- Surface disturbance issues which may involve some vegetation clearing, disturbance to soils and potential impact to archaeological relics
- Economic and social issues
- Construction activities resulting in additional noise, dust and traffic.

These activities have been explored in a risk assessment as described in the following section.

7.3 Risk Assessment

An environmental risk assessment for the Project was carried out in November 2011. The purpose of the environmental risk assessment was to identify those issues relating to the Project that represent the greatest risk to the local environment and surrounding populace and assist in setting (and justifying) priorities for the level of assessment required to address each identified risk within this EA. The risk assessment process followed is summarised below:

- identifying potential hazards/impacts
- determining the consequence of the hazard/impact occurring
- determining the likelihood of an event occurring
- assessing the risk by determining the probability (likelihood) and consequence (effect) of each hazard/impact
- identifying the controls/safe guards to mitigate the hazard/impact

- the reassessing the risk by determining the probability (likelihood) and consequence (effect) of each hazard/impact with the implementation of mitigation measures.

Centennial's Risk Management Standard Risk Matrix was used to calculate the consequence and likelihood of an event to evaluate the subsequent risk level (risk rank). This system operates in accordance with AS/NZS 4360:2004 and results are shown in **Table 5**.

Table 5: Lidsdale Siding Upgrade - Risk Ranking of Environmental Considerations

Risk Category	Consequences	Generic Management Actions
Extreme	**Major offsite impact**	Immediate Intervention required from Senior Management to eliminate or reduce this risk
High	**Minor offsite impact or major onsite impact**	Imperative to eliminate or reduce risk to lower level by the introduction of control measures, management planning required at senior level
Significant	**Moderate onsite impact**	Corrective action required, senior management attention needed to eliminate or reduce risk
Moderate	**Minor onsite impact**	Corrective action to be determined, management responsibility must be specified
Low	**Negligible impact**	Monitor and manage by corrective action where practicable

Through the risk analysis process, the potential environmental impacts were ranked. The risk assessment's boundaries were confined to the project description of the Project. The outcome of the risk assessment was a list of recommended controls that then guided the development of specialist studies for the Project. **Table 6** lists the environmental considerations, their risk ranking, whether they have been identified for assessment by the DGRs and how the issue has been addressed in the EA.

Table 6: Lidsdale Siding Upgrade - Risk Ranking of Environmental Considerations against issues identified within the DGR's.

Environmental Considerations	Risk Rank		Identified in DGRs?	How Addressed in EA
	Construction	Operation		
Loss of Air Quality	Moderate	Moderate	Yes	Prediction and assessment undertaken. Refer to Section 8.4.2.
Excessive Noise and Vibration	Significant	High	Yes	Assessment undertaken Addressed within Section 8.4.1 of EA
Adverse Traffic Impacts	Significant	Significant	Yes	Assessment undertaken Addressed within Section 8.4.8 of EA
Water Management ▪ Adverse Groundwater impacts ▪ Surface Water systems being altered	Moderate	Significant	Yes	Assessment have been undertaken for Groundwater and Surface Water impacts Refer to Section 8.4.4 for Groundwater and 8.4.5 for Surface water
Visual Amenity Altered	Significant	Moderate	Yes	Assessment undertaken Addressed within Section 8.4.7 of EA

Environmental Considerations	Risk Rank		Identified in DGRs?	How Addressed in EA
	Construction	Operation		
Ecological Impacts (Loss of native vegetation and habitat)	Moderate	Low	Yes	Assessment undertaken Addressed within Section 8.4.13 of EA
Heritage Impacts ▪ Damage to European Heritage ▪ Damage Aboriginal Heritage	Low	Low	Yes	Assessment undertaken Addressed within Section 8.4.14 of EA
Contamination of water and land	Moderate	Moderate	Yes	Assessment undertaken Addressed within Section 8.4.6 of EA
Soils and Geology	High	Low	Yes	Assessment undertaken Addressed within Section 8.4.11 of EA
Community and Social changes	Significant	Low	Yes	Assessment undertaken Addressed within Section 8.4.9 of EA
Sustainability /Greenhouse – Increased energy requirements	Low	High	Yes	Assessment undertaken Addressed within Section 8.4.3 of EA
Economic changes	Low	High	Yes	Assessment Undertaken Addressed within Section 8.4.10 of EA
Waste Management	Low	Low	Yes	Addressed within Section 8.4.16 of EA
Cumulative Impacts	Moderate	Significant	Yes	Addressed within Section 8.5 of EA
Hazard & Risk	Significant	High	Yes	Addressed within Section 8.4.15 of EA

8.0 Environmental Assessment

8.1 Introduction

This section provides the environmental assessment of the Project as described in Section 4.0 Project Description. A range of specialist assessments were undertaken and have informed the overall assessment. The environmental assessment team is identified in Section 8.2 below. The assessment addresses the Director General's Requirements as identified in Section 8.3. A description of the general environmental assessment methodology is provided in Section 8.4. This is followed by the description of the existing situation, environmental impacts during construction and operation, mitigation measures and any residual impacts for the following:

- noise and vibration
- air quality
- greenhouse gas
- surface water
- groundwater
- contamination
- visual amenity
- traffic and transport
- social
- economics
- soils, land resources and agriculture
- terrestrial ecology
- aquatic ecology
- heritage

Hazard, Risk and Waste have also been addressed within this Environmental Assessment despite not being specified within the DGRs.

8.2 Environmental Assessment Team

The environmental assessment team is identified in **Table 7** below.

Table 7: Environmental Assessment Team

Role	Company
Proponent	Centennial
EA Project Management	RPS
Groundwater	RPS Aquaterra
Surface Water	RPS Aquaterra
Noise and Vibration	Hatch
Traffic and Transport	Barnson
Air Quality	SLR
Greenhouse Gas	SLR
Contamination	AECOM

Role	Company
Soils, Land Resources and Agriculture	GSSE
Heritage	RPS
Terrestrial Ecology	RPS
Aquatic Ecology	Marine Pollution Control
Social	Lantz Marshall
Economic	Aigis Group
Visual	RPS with Centennial
Waste	RPS with Centennial

8.3 Addressing the DGRs

The DGRs for the Project were issued in January 2012 and these are provided in **Appendix 1**. The key issues and reference to where they are addressed within this EA are set out in **Table 8** below. Detailed responses to the matters raised are provided in the specialist assessment reports that are appended.

Table 8: How the DGRs have been addressed

Director General's Requirements	Reference within the EA
General Requirements	
The Environmental Assessment of the Project must include: ▪ an executive summary ▪ a detailed description of: - historical operations on site; - existing and approved operations and infrastructure on site including any statutory approvals that apply to these operations and infrastructure; and - the existing environmental management and monitoring regime in site. ▪ a risk assessment of the potential environmental impacts of the project, identifying the key issues for further assessment ▪ a detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment, which includes - a description of the existing environment, using sufficient baseline data: - an assessment of the potential impacts associated with the concurrent operation of the project with any other existing or approved mining operations in the region, taking into consideration any relevant policies , guidelines, plans and statutory provisions; and - a description of the measures that would be implemented to avoid, minimise, mitigate and/or offset the potential impacts of the project, including detailed contingency plans for managing any significant risks to the environment. ▪ A statement of commitments, outlining all the proposed environmental management and monitoring measures ▪ A conclusion justifying the project on economic, social and environmental grounds, taking into consideration whether the project is consistent with the objects of the EP&A Act.. ▪ A signed statement from the author of the Environmental Assessment, certifying that the information contained within the document is neither false nor misleading.	

Key Issues	
▪ **Noise & Vibration –** including a quantitative assessment of the potential construction, operational and transport noise impacts from the Project;	A summary of noise and vibration issues associated with the Project is provided at Section 8.4.1. The Noise and Vibration Assessment is contained within **Appendix 2**.
▪ **Soil & Water** – including: - a detailed site water balance for the Project; - detailed modelling and assessment of the potential surface water of the Project, including any flood impacts; and - a preliminary land contamination investigation under SEPP 55;	Soils, Land Resources and Agriculture is addressed within Section 8.4.11, and the detailed assessment is provided at **Appendix 11**. Surface Water is addressed in Section 8.4.4. The Surface Water Assessment detailing the site water balance for the Project is provided at **Appendix 4**. SEPP 55 has relevance to the Project in relation to the potential for construction activities to disturb a previously unidentified area of contamination and a requirement for a preliminary land investigation has been identified within the key issues in the DGR's. The contamination assessment located some areas of hydrocarbon contamination primarily around a previously removed above ground fuel tank and the workshop and refuelling areas. Although some hydrocarbons were detected below ground there was no evidence of contamination leaving the site. Contamination issues are addressed in Section 8.4.6 of this report. Additionally a Groundwater Assessment has been undertaken for the Project which is summarised in Section 8.4.5, the assessment is provided at **Appendix 5**.
▪ **Traffic & Transport –** including: - accurate predictions of the rail traffic of the Project; - a detailed assessment of the potential impacts of this traffic on the safety and efficiency of the rail networks, including the railway crossings that would be impacted; and - a detailed description of the measures that would be implemented to maintain and/or upgrade these networks over the life of the Project.	A summary of traffic and transport issues, including an assessment of rail traffic associated with the Project is provided at Section 8.4.8. A Traffic and Rail Impact Assessment is provided at **Appendix 8**.
▪ **Air – including**: - a quantitative assessment of the potential air quality impacts of the Project; and - an investigation of methods to control dust lift-off from coal wagons;	A summary of Air Quality issues associated with the proposal is provided at Section 8.4.2. The Air Quality Assessment is provided at **Appendix 3.**

Director General's Requirements General Requirements	Reference within the EA
▪ **Greenhouse Gas –** including: - a quantitative assessment of the potential scope 1, 2 and 3 greenhouse gas emissions; - qualitative assessment of the potential environmental impacts of these emissions; and - a detailed description of the measures that would be implemented on site to minimise the greenhouse gas emissions of the Project;	A summary of Greenhouse Gas issues associated with the proposal is provided at Section 8.4.3. Additional detail relating to Greenhouse is provided within the Air Quality and Greenhouse Gas (GHG) Assessment in **Appendix 3**.
▪ **Heritage –** both Aboriginal and non-Aboriginal;	A summary of Heritage issues associated with the proposal is provided at Section 8.4.14. The Cultural Heritage Assessment is provided at **Appendix 14**.
▪ **Biodiversity –** including; - a detailed assessment of the potential impacts of the Project on any terrestrial or aquatic threatened species or populations, or their habitats, endangered ecological communities or groundwater dependent ecosystems; and - a detailed description of the measures that would be implemented to avoid or mitigate impacts on biodiversity;	A summary of Terrestrial Ecology surrounding the site is contained within Section 8.4.12 and Aquatic Ecology is discussed within Section 8.4.13. The Terrestrial and Aquatic Ecology assessments are contained within **Appendix 12 and 13** respectively.
▪ **Visual**	A summary of the Visual Assessment is contained within Section 8.4.7.
▪ **Waste –** including: - accurate estimates of the quantity and nature of the potential waste streams of the Project; and - a detailed description of the measures that would be implemented to minimise, appropriately handle and dispose of waste on site; and	Waste is addressed within Section 8.4.16.

8.4 Key Environmental Issues

8.4.1 Noise and Vibration

8.4.1.1 Introduction

HATCH was engaged by Centennial to undertake a Noise and Vibration Impact Assessment for the Project. A copy of the Assessment is contained within **Appendix 2**.

The Noise Impact Assessment of the Project follows the requirements of the NSW Industrial Noise Policy, and includes the results of attended and unattended noise monitoring done in May and September 2008, September 2011 and January 2012. Sound levels of the current operations have been monitored at the site

boundary and at the nearest residential receiver areas in different directions from the site, as identified in **Figure 6**.

Significant findings and recommendations from the Noise and Vibration Impact Assessment are summarised below.

8.4.1.2 Existing Situation

The site currently receives coal by overland conveyor from Centennial Coal Services. It also currently receives some coal by road truck on public roads. This coal is placed on the ground at the discharge from the overland conveyor and is then loaded by front-end-loader (FEL) onto site trucks. These trucks then transport the coal to a long stockpile adjacent to the rail siding. The site has been in operation for approximately 40 years.

The coal stockpile is built continuously between train arrivals, which currently occur approximately twice per day but can be up to five per day, seven days per week. Operations occur 24-hours per day. Trains with 48 wagons are filled over a two-hour period by three FEL's from the stockpile on the eastern side of the train. Each wagon requires approximately five bucket loads from a FEL to fill.

As seen in **Figure 6**, the nearest residential receiver to the site is a single house located adjacent to the site access road, approximately 200m from the discharge of the overland conveyor. The nearest residential area is in Wallerawang, approximately 440m south of the site from the overland conveyor discharge and 350m to the nearest stockpile operations. Some isolated farm houses are located to the west of the site, the closest being 430m from the end of the overland conveyor and 300m from the nearest stockpile operations. A residential area at Lidsdale is located approximately 750m north-east of the site, to the north of the Castlereagh Highway and Wallerawang Power Station. On the northern side of the existing rail line, which is part of the Wallerawang Colliery line, trains stop approximately 400m from residents located to the east, on the eastern side of the Castlereagh Highway.

8.4.1.3 Project Specific Noise Criteria

The Assessment carried out monitoring of environmental noise using two different methods - unattended monitoring and attended monitoring. With unattended monitoring, a data-logging sound level meter measures the sound level continuously and stores the statistical sound levels every 15-minutes. This data can then be used to assess ambient sound levels at different times of the day. Attended monitoring uses a trained engineer to measure the sound level at a location with a precision instrument and record the statistical sound levels and other aspects occurring at the time of the measurements, including sources of noise, weather conditions and operational aspects of a site.

This combined monitoring approach is intended to be the same as the long-term monitoring method described in Section 3 of the NSW Industrial Noise Policy (INP).

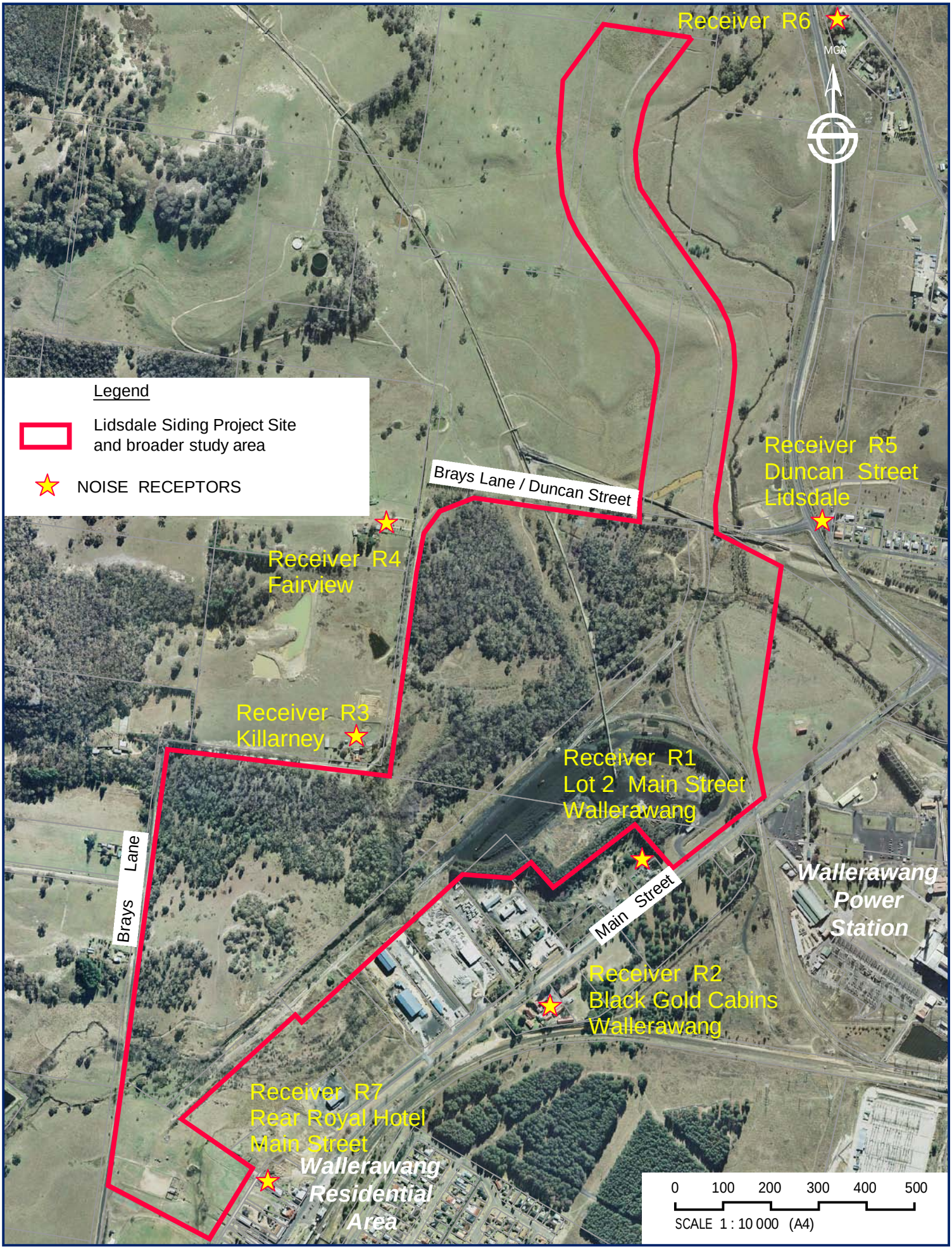

FIGURE 6

TITLE: **Lidsdale Siding Upgrade Project** NOISE RECEPTORS LOCATION | LOCATION: WALLERAWANG | DATUM: (GDA 94) PROJECTION: PROJECT AREA | DATE: 14TH AUG 2012 PURPOSE: ENV ASSESSMENT | CAD REF: **110912 Upgrades to Project Area** VERSION: Noise Receptors

CLIENT: CENTENNIAL COAL
JOB REF: 110912

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

From the measurements of sound levels at the residential receiver locations, the derived and recommended Project Specific Noise Levels (PSNL's) for the receiver locations are shown in **Table 9**.

Table 9: Project Specific Noise Levels for the Nearest Residential Receiver Locations

Receiver Location	Project Specific Noise Level - $L_{AEQ.15\text{-}min}$ dBA for time of day			Sleep Disturbance
	Daytime	Evening	Night-time	Night time
# 1 Lot 1, Main Street Wallerawang	49	42	40	58
#2 Black Gold Cabins, Main Street Wallerawang	47	42	41	56
# 3 Killarney, Bray's Lane, Wallerawang	45	39	39	51
# 4 Fairview, Bray's Lane, Wallerawang	42	38	35	51
# 5 Duncan Street, Lidsdale	49	42	42	62
# 6 Old Highway, Lidsdale	45	42	40	50
# 7 Royal Hotel, Main Street Wallerawang	41	40	35	47

8.4.1.4 Construction Impact Assessment

Construction activities will include earthmoving equipment, excavation, fabrication and erection. These activities will occur while operations are continued concurrently on site for most of the expected 9 to 12-month construction period.

Noise received at residential locations from proposed construction activities on site are expected to be in the same sound level range, character and type as those currently existing, for most of the time. There will be periods of different noise sources occurring, such as hydraulic hammers during excavation or construction generators during later fabrication and erection, but these are not expected to be significant.

Vibration sources will be used but are unlikely to be discernible or measurable at the nearest residences, because of their distance and relatively low vibration input. This means that the potential for vibration damage to buildings or structures is extremely unlikely.

Road traffic generated by the construction will have an average of four truck movements and 20 light vehicles per day over a 12-month period, with a peak of 200 truck movements per day for four weeks. This peak truck movement period will not cause increases in sound levels of more than 1 dB.

A construction noise management plan will be implemented for the project. This will include monitoring of noise and vibration during the construction activity to ensure objectives are being achieved. It is considered that the noise emissions from the site can achieve the noise objectives of the NSW Interim Construction Noise Guideline.

8.4.1.5 Operational Impact Assessment

In essence the Project will provide a significant reduction in noise emissions compared to the current operation. This is largely a result of the replacement of a large number of mobile plant engaged in transfer of coal from the current overland conveyor discharge point to the loading area and the manual loading of trains with a new automated stockpiling and loading system. The new plant to be installed will include fixed plant conveyors, stockpile and an overhead rail loading bin and a stable siding alongside the western side of the current siding. The train operations will remain similar to current in terms of train consist but be increased in number per day, and on occasions, there will be trains stabled in the new siding. FEL's and site trucks involved in loading trains will be replaced, although one dozer will remain to maintain the stockpile. The

Project Site will not receive coal by road. Road traffic movements to and from the site will be very minor and not affect road traffic noise levels.

Major noise sources from existing operations are:

Main rail loading stockpile building:

- A front-end loader at the overland conveyor delivery stockpile loading trucks on site to build the main rail loading stockpile
- A front-end loader on site at the main rail loading stockpile building the stockpile from the coal delivered by the trucks
- Trucks delivering coal to the main rail loading stockpile

Loading of trains:

- Three front-end loaders loading from the main stockpile into train wagons
- A front-end loader operating on the western side of the train being loaded, to trim the tops of the coal in the wagons
- Locomotives stationary at idle or Notch 2 movement speed
- Run-in run-out (Ri-Ro) noise of train movements

These activities occur continuously 24-hours per day, seven days per week. Currently two to three trains per day are loaded.

As stated in the Assessment predictions of current noise are likely to be higher than occur in reality because a number of simplifying assumptions that have been made in the computer noise modelling.

Table 10 presents a comparison between the predicted sound levels for current operations with those for the proposed operations. The predictions are for worst case weather. The comparisons are not exact because the Project will enable train loading to occur while stockpile loading is also occurring, whereas this cannot occur currently.

The comparison of results in **Table 10** shows that the proposed operation will be a minimum of 9 dB quieter than the current operation across all cases. The maximum difference could be 30 dB quieter. It should be noted that currently train loading occurs two to three times in a 24-hour period and stockpile building occurs at other times, while in the new development there will be up to 7 trains per day loaded and stockpile operation could be continuous, but with a dozer operating for approximately 1-hour per train. A new dozer/FEL will be procured for the operation which will be 5 dB quieter than those currently operating, so sound levels from this operation will be lower than the current operation with four higher sound level FELs operating.

Despite the increased frequency of trains, it is considered that the reduction in sound levels of at least 9 dB with the Project will be significant.

Table 10: Comparing Predicted sound levels from existing sources with proposed sources

Calculations using computer noise model ENM based on the same landform, using measured sound levels from loading trains and stockpile building for existing operations. Calculations assume no barrier from existing or proposed coal stockpile to allow for when empty (which is not the case for existing loading) and assumes no barrier from train for propagation to R3 & R4. Values calculated and contained within columns shaded green represent changes or differences between predicted sound levels for current operations against proposed operations associated with the Project.

Lidsdale Existing Sources assuming no barrier from stockpile or train wagons		Lidsdale proposed sources			Lidsdale proposed sources	
Receiver		**Receiver**			**+ Stabled Train Loco at Bin**	
R1	**Max**	**R1**	**Max**	**Δ Max**	**Max Stable**	**Δ Max Stable**
Stockpile Build Maximum Impact	74					
Stockpile Build LAEq	65	Stockpile build inc dozer	51	14	49	15
		Stockpile build no dozer	35	30	42	23
Train loading no Ri-Ro LAEq	62	Train load no Ri-Ro	38	24	40	22
Train loading inc Ri-Ro LAEq	62	Train load inc Ri-Ro	39	23	40	22
		Train load inc dozer & Ri-Ro	51	11	49	13
R2i	**Max**	**R2i**	**Max**	**Δ Max**	**Max Stable**	**Δ Max Stable**
Stockpile Build Maximum Impact	74					
Stockpile Build LAEq	63	Stockpile build inc dozer	48	15	48	15
		Stockpile build no dozer	35	28	43	20
Train loading no Ri-Ro LAEq	62	Train load no Ri-Ro	43	19	44	18
Train loading inc Ri-Ro LAEq	62	Train load inc Ri-Ro	44	18	45	17
		Train load inc dozer & Ri-Ro	48	14	48	14
R2ii	**Max**	**R2ii**	**Max**	**Δ Max**	**Max Stable**	**Δ Max Stable**
Stockpile Build Maximum Impact	74					
Stockpile Build LAEq	64	Stockpile build inc dozer	48	16	49	15
		Stockpile build no dozer	35	29	42	21
Train loading no Ri-Ro LAEq	62	Train load no Ri-Ro	43	19	43	19
Train loading inc Ri-Ro LAEq	62	Train load inc Ri-Ro	44	18	45	17
		Train load inc dozer & Ri-Ro	48	14	49	13

R3	Max	R3	Max	Δ Max	Max Stable	Δ Max Stable
Stockpile Build Maximum Impact	74					
Stockpile Build LAEq	63	Stockpile build inc dozer	47	16	49	15
		Stockpile build no dozer	34	29	44	20
Train loading no Ri-Ro LAEq	62	Train load no Ri-Ro	42	20	43	19
Train loading inc Ri-Ro LAEq	62	Train load inc Ri-Ro	43	19	44	18
		Train load inc dozer & Ri-Ro	47	15	49	14
R4	**Max**	**R4**	**Max**	**Δ Max**	**Max Stable**	**Δ Max Stable**
Stockpile Build Maximum Impact	71					
Stockpile Build LAEq	59	Stockpile build inc dozer	45	14	45	14
		Stockpile build no dozer	31	28	41	18
Train loading no Ri-Ro LAEq	59	Train load no Ri-Ro	39	20	39	20
Train loading inc Ri-Ro LAEq	59	Train load inc Ri-Ro	40	19	41	18
		Train load inc dozer & Ri-Ro	45	14	45	13
R5	**Max**	**R5**	**Max**	**Δ Max**	**Max Stable**	**Δ Max Stable**
Stockpile Build Maximum Impact	68					
Stockpile Build LAEq	58	Stockpile build inc dozer	45	13	46	12
		Stockpile build no dozer	29	29	35	23
Train loading no Ri-Ro LAEq	56	Train load no Ri-Ro	40	16	40	16
Train loading inc Ri-Ro LAEq	56	Train load inc Ri-Ro	40	16	40	16
		Train load inc dozer & Ri-Ro	45	11	46	10
R6	**Max**	**R6**	**Max**	**Δ Max**	**Max Stable**	**Δ Max Stable**
Stockpile Build Maximum Impact	60					
Stockpile Build LAEq	49	Stockpile build inc dozer	37	12	39	10
		Stockpile build no dozer	21	28	28	22
Train loading no Ri-Ro LAEq	48	Train load no Ri-Ro	29	19	36	12
Train loading inc Ri-Ro LAEq	48	Train load inc Ri-Ro	33	15	37	11
		Train load inc dozer & Ri-Ro	37	11	39	9

R7	Max	R7	Max	Δ Max	Max Stable	Δ Max Stable
Stockpile Build Maximum Impact	69					
Stockpile Build LAEq	56	Stockpile build inc dozer	40	16	40	16
		Stockpile build no dozer	28	28	39	16
Train loading no Ri-Ro LAEq	55	Train load no Ri-Ro	33	22	35	20
Train loading inc Ri-Ro LAEq	56	Train load inc Ri-Ro	40	16	40	16
		Train load inc dozer & Ri-Ro	40	16	40	16
			Max Δ	30		23
			Min Δ	11		9

Rail Activities

Rail operations already occur to and from the site and have done so for over 40 years. There will be an increase in the number of train movements to and from the site from the current two trains (four movements) per day at present, to a maximum of seven trains (fourteen movements) per day. The changes in noise levels for the increased operations have been calculated at a number of locations along the path between Lithgow and the Sydney metropolitan network at Penrith. The change in sound levels at adjoining locations from the additional train movements is calculated to be less than 2 dB. This is considered to be within a range considered acceptable for a change in operations, as given in the relevant policy document Interim Guideline for the assessment of noise from Rail Infrastructure Projects produced by the then Department of Environment & Climate Change in 2007. Current sound levels from rail movements between Lithgow and Penrith are calculated to exceed the trigger levels for noise for night-time periods but not those for daytime. Additional movements will increase both the daytime and night-time period sound levels by 1 dB above current values.

The trains proposed to be used will be the same as currently in service to and from the site, or newer quieter trains. The nature and sound levels from these will not change, although a reduction in Ri-Ro noise is expected to occur at most locations near the Siding site. Reduction in rail noise is being considered by rail operators John Holland Rail and RailCorp as part of their respective Environment Protection Licence conditions.

8.4.1.6 Mitigation

The Assessment indicates that total site sound levels are calculated to be a minimum of 9 dB lower than calculated for current operational sound levels. Up to 30 dB reduction is possible for some conditions and receivers. On the basis of the above, it is considered that the operation of the Project activities can be achieved within the recommended noise criteria and have a low potential for noise annoyance.

Sound levels from existing operations that will remain, including train movements (locomotives and Ri-Ro) and stockpile management dozer/FEL, will add to the new sources and cause the night-time PSNLs to be exceeded at most locations. These sound levels will be similar to or less than those which currently occur from the site. The number of impact sounds from the site caused by train Ri-Ro movements and FEL loading of coal wagons will be significantly reduced by removal or unshielded wagon loading and the reduction in number of train stops and starts at the site.

A construction noise management plan will be implemented for the Project. This will include monitoring of noise and vibration during the construction activity to ensure objectives are being achieved. It is considered that the noise emissions from the site can achieve the noise objectives of the NSW Interim Construction Noise Guideline.

A new dozer/FEL will be procured for the operation which will be 5 dB quieter than those currently operating, hence sound levels from this operation will be lower than the current operation with four higher sound level FELs operating.

8.4.1.7 Residual Impacts

The Assessment concludes on the basis of the investigations undertaken that the project components can be constructed and operated within the recommended noise criteria and have a low potential for noise annoyance.

Attention will be paid to specification and design engineering to achieve the allowable sound power levels assigned for the new noise sources (conveyors, drives, chutes and rail loading bin noise barriers). Review of noise source sound levels as a part of the procurement process and in commissioning is recommended to ensure that the noise objectives are achieved.

On the basis of the above, with achievement of PSNLs for most conditions for the new continuous operating plant, and reduced sound levels and impacts for existing sources, the Project is considered to be acceptable.

8.4.2 Air Quality

8.4.2.1 Introduction

SLR Consulting was commissioned by Centennial to prepare an Air Quality Impact Assessment for the Project. A copy of the Assessment, including a Greenhouse Gas Assessment, is contained within **Appendix 3** of the EA. Significant findings and recommendations from the Assessment relating to Air Quality are summarised below.

8.4.2.2 Existing Situation

A number of residences have been identified as sensitive receptors in the area surrounding the Project Site. The locations of the identified sensitive receptors located within 1 kilometre of the Project Site are shown in **Figure 7**.

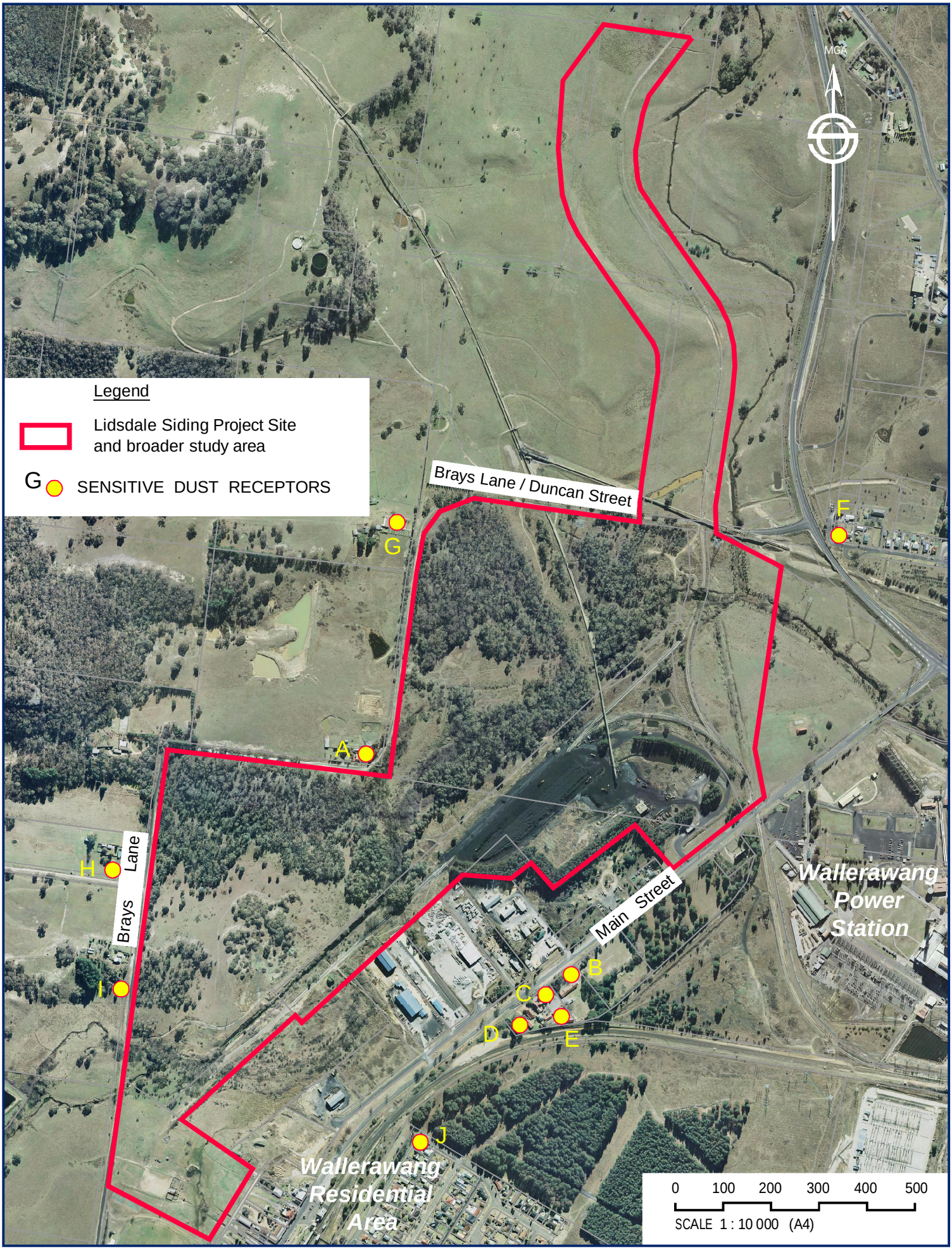

FIGURE 7

TITLE: **Lidsdale Siding Upgrade Project** SENSITIVE DUST RECEPTORS | LOCATION: WALLERAWANG | DATUM: (GDA 94) PROJECTION: PROJECT AREA | DATE: 22ND AUG 2012 PURPOSE: ENV ASSESSMENT | CAD REF: **110912 Upgrades to Project Ar** VERSION: Dust Receptors

CLIENT: CENTENNIAL COAL
JOB REF: 110912

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The air quality in the region surrounding the Lidsdale Siding site is influenced by emissions generated by a range of sources, originating from both within and outside of the local area. Specifically, for the area surrounding the Project Site, air quality will be influenced by emissions from the two power stations, pollution transported into the area from more distant sources and pollution generated by the Siding itself. A number of industrial facilities with the potential to have a cumulative impact on the local airshed were identified. A dispersion modelling exercise was performed to determine the relative contribution from the project and other industrial sources in order to assess the impacts from the Project.

The Assessment has calculated the current total particulate site emissions, including total suspended particulate matter (TSP), particular matter with an equivalent aerodynamic diameter of 10 microns or less (PM_{10}), particular matter with an equivalent aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) and these are presented in **Table 11** below.

Table 11: Estimated Annual Particulate Emissions

Pollutant	kg/year
	Current Operations
TSP	152,101
PM_{10}	47,359
$PM_{2.5}$	4,829

The results of the dispersion modelling for dust deposition, TSP concentrations, PM_{10} Concentrations and PM_{10} Concentrations from the existing operation at each of the identified receptors are presented in **Tables 12 to 15.**

Table 12: Predicted Incremental Annual Average Dust Deposition Rates

Receptor ID	Annual Average Dust Deposition Rate (g/m^2/month)		
	Background	Current Operations	
		Increment	Cumulative
A	3.8	0.48	4.3
B	3.8	0.18	4
C	3.8	0.17	4
D	3.8	0.16	4
E	3.8	0.14	3.9
F	3.8	0.13	3.9
G	3.8	0.15	4
H	3.8	0.08	3.9
I	3.8	0.09	3.9
J	3.8	0.05	3.8

Note: Criteria – 2 g/m^2/month (incremental), 4 g/m^2/month (cumulative)

Table 13: Predicted Annual Average TSP Concentrations – Current Operations

Receptor ID	Increment	Increment	Increment	Cumulative	Cumulative
	Regional Background	Power Station	Current Project	Total Background	Total Background + Current Project
	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
A	27.6	6.7	10.8	34.3	45.1
B	27.6	7.6	4.2	35.2	39.4
C	27.6	7.1	3.8	34.7	38.5
D	27.6	6.9	3.6	34.5	38.1
E	27.6	7.4	3.2	35	38.2
F	27.6	10.9	2.9	38.5	41.4
G	27.6	6.7	3.5	34.4	37.9
H	27.6	5	1.8	32.6	34.5
I	27.6	4.3	2	32	34
J	27.6	5.6	1.1	33.2	34.3

Note: Project criterion – 90 $\mu g/m^3$

Table 14: Predicted Annual Average PM_{10} Concentrations – Current Operations

Receptor ID	Increment	Increment	Increment	Cumulative	Cumulative
	Background	Power Station	Current Project	Total Background	Total Background + Current Project
	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
A	13.8	3.3	6.2	17.1	23.3
B	13.8	3.8	1.9	17.6	19.5
C	13.8	3.5	1.8	17.3	19.1
D	13.8	3.4	1.8	17.2	19
E	13.8	3.7	1.4	17.5	18.9
F	13.8	5.4	1.8	19.2	21
G	13.8	3.3	2	17.2	19.2
H	13.8	2.5	1	16.3	17.3
I	13.8	2.1	1.1	16	17.1
J	13.8	2.7	0.5	16.6	17.1

Note: Project criterion – 30 $\mu g/m^3$

Table 15: Predicted Annual Average $PM_{2.5}$ Concentrations – Current Operations

Receptor ID	Increment	Increment	Increment	Cumulative	Cumulative
	Regional Background	Power Station	Current Project	Total Background	Total Background + Current Project
	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
A	nd(1)	0.6	1.4	0.6	2
B	nd	0.7	0.5	0.7	1.2
C	nd	0.6	0.5	0.6	1.1
D	nd	0.6	0.5	0.6	1.1
E	nd	0.6	0.4	0.6	1.1
F	nd	0.9	0.5	0.9	1.4
G	nd	0.6	0.6	0.6	1.2
H	nd	0.5	0.3	0.5	0.8
I	nd	0.4	0.3	0.4	0.8
J	nd	0.5	0.2	0.5	0.7

Note: (1) nd = no data

8.4.2.3 Construction and Operational Impact Assessment

Dispersion modelling based upon the following assessment scenarios has been carried out by the Air Quality Impact Assessment.

The Operational Scenario relates to emissions once the Project has been fully constructed. This scenario represents the normal operational scenario at the Project Site. This constitutes receiving and dispatching of up to 6.3 Mtpa of coal. It is noted that this scenario represents the upgraded automated operations.

The Construction Scenario relates to emissions during construction in order to upgrade the Project Site. Specifically, the construction operations include extending the existing rail line and constructing a separate shunt towards southwest of the Project Site; and construction of a reclaim tunnel under the main stockpile. This also includes the installation of four reclaimers and a conveyor belt to transport the coal from the main stockpile to the rail loading bin and stockpile feed conveyor with travelling plough.

Estimated Annual Particulate Emissions

The total particulate emissions (TSP, PM_{10} and $PM_{2.5}$) estimated for the scenarios are presented in **Table 16**. The calculations of annual TSP emissions resulting from current site operations indicate that the emissions are up to 5.5 times greater than what is predicted to be emitted once the site is upgraded. PM_{10} and $PM_{2.5}$ emissions are calculated as currently being approximately 4 times greater than those predicted following site upgrade.

Table 16: Estimated Annual Particulate Emissions

Pollutant	Modelled Scenario (kg/year)		
	Operational Scenario	Construction Scenario	Current Operations
TSP	27,416	2,258	152,101
PM_{10}	10,816	804	47,359
$PM_{2.5}$	1,100	80	4,829

A summary of the results of the dispersion modelling exercise demonstrating the anticipated reductions in ground level particulate concentrations at surrounding sensitive receptors during and following the construction of the Project are provided below.

Dust Deposition

Table 17 shows the results of the dispersion modelling for dust deposition from the Project Site at each of the identified receptors.

Table 17: Predicted Incremental Annual Average Dust Deposition Rates

Receptor ID	Annual Average Dust Deposition Rate (g/m^2/month)						
	Background	Current Operations		Operational Scenario		Construction Scenario	
		Increment	Cumulative	Increment	Cumulative	Increment	Cumulative
A	3.8	0.48	4.3	0.09	3.9	0.01	3.8
B	3.8	0.18	4	0.06	3.9	<0.01	3.8
C	3.8	0.17	4	0.05	3.9	<0.01	3.8
D	3.8	0.16	4	0.05	3.8	<0.01	3.8
E	3.8	0.14	3.9	0.05	3.9	<0.01	3.8
F	3.8	0.13	3.9	0.01	3.8	<0.01	3.8
G	3.8	0.15	4	0.02	3.8	<0.01	3.8
H	3.8	0.08	3.9	0.02	3.8	<0.01	3.8
I	3.8	0.09	3.9	0.02	3.8	<0.01	3.8
J	3.8	0.05	3.8	0.02	3.8	<0.01	3.8

Note: Criteria – 2 g/m^2/month (incremental), 4 g/m^2/month (cumulative)

The results indicate that incremental and cumulative annual average dust deposition rates at all nominated residences/properties surrounding the Project Site are predicted to be well below the criterion of 2 g/m^2/month (incremental increase in dust deposition) and below 4 g/m^2/month (cumulative dust deposition) during the Operational Scenario and the Construction Scenario. As the nominated residences/properties were chosen as being indicative of all surrounding residences/properties, it can be concluded that cumulative dust deposition levels at residences/properties surrounding those modelled would also be below the relevant criterion of 4 g/m^2/month during these Scenarios.

It is also demonstrates that the Project will result in significantly reduced dust deposition rates at all surrounding receptor locations when compared to the current situation.

Particles (as TSP)

Table 18 presents the annual average TSP concentrations predicted by the dispersion modelling at each of the nominated residences/properties under the Operational Scenario.

Table 18: Predicted Annual Average TSP Concentrations – Operational Scenario

Receptor ID	Increment	Increment	Increment	Cumulative	Cumulative
	Regional Background	Power Station	Project	Total Background	Total Background + Project
	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
A	27.6	6.7	3.5	34.3	37.8
B	27.6	7.6	2.1	35.2	37.3
C	27.6	7.1	2	34.7	36.7
D	27.6	6.9	1.8	34.5	36.4
E	27.6	7.4	1.8	35	36.8
F	27.6	10.9	0.6	38.5	39.1
G	27.6	6.7	0.7	34.4	35.1
H	27.6	5	0.8	32.6	33.4
I	27.6	4.3	0.7	32	32.7
J	27.6	5.6	0.5	33.2	33.7

Note: Project criterion – 90 $\mu g/m^3$

During the Operational Scenario, annual average TSP concentrations are predicted to be well below the criterion of 90 $\mu g/m^3$ at all identified sensitive receptor locations. As the nominated residences/properties were chosen as being indicative sensitive locations typifying the local surrounding communities, it is unlikely that annual average TSP concentrations at other residences and properties surrounding these modelled residences would exceed the OEH criterion of 90 $\mu g/m^3$.

Table 19 presents the annual average TSP concentrations predicted by the dispersion modelling at each of the nominated residences/properties under the Construction Scenario.

Table 19: Predicted Annual Average TSP Concentrations – Construction Scenario

Receptor ID	Increment	Increment	Increment	Cumulative	Cumulative
	Regional Background	Power Station	Project	Total Background	Total Background + Project
	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
A	27.6	6.7	0.3	34.6	34.8
B	27.6	7.6	0.2	35.4	35.7
C	27.6	7.1	0.2	34.9	35.1
D	27.6	6.9	0.2	34.7	34.9
E	27.6	7.4	0.2	35.2	35.4
F	27.6	10.9	0	38.5	38.6
G	27.6	6.7	0.1	34.4	34.5
H	27.6	5	0	32.7	32.7
I	27.6	4.3	0.1	32	32.1
J	27.6	5.6	0.1	33.3	33.3

Note: Project criterion – 90 $\mu g/m^3$

During the Construction Scenario, annual average TSP concentrations are predicted to be below the criterion of 90 μg/m^3 at all identified sensitive receptor locations. As the nominated residences/properties were chosen as being indicative sensitive locations typifying the local surrounding communities, it is unlikely that annual average TSP concentrations at other residences and properties surrounding these modelled residences would exceed the OEH criterion of 90 μg/m^3.

It is demonstrated that the predicted annual average TSP concentrations resulting from current site operations are anticipated to be reduced by up to approximately 7 μg/m^3 following Project implementation.

PM $_{10}$

The maximum 24-hour average PM_{10} concentrations are predicted to exceed the criterion of 50 μg/m^3 at six identified sensitive receptor locations during the Operational Scenario and at four identified sensitive receptor locations during the Construction Scenario.

On further investigation it was found that the predicted exceedances are caused due to the high background 24-hour average PM_{10} concentrations during both the scenarios.

Exceedances of the 24-hour PM_{10} criterion are currently anticipated to number six, although concentrations are modelled to be currently approximately double those anticipated following the site upgrade.

However the annual average PM_{10} concentrations are predicted to be well below the criterion of 30 μg/m^3 at all identified sensitive receptor locations during the Operational Scenario and the Constrcution Scenario and slightly higher during current site operations.

$PM_{2.5}$

The maximum 24-hour average $PM_{2.5}$ concentrations are predicted to be well below the criterion of 25 μg/m^3 at all identified sensitive receptor locations during the Operational Scenario and the Construction Scenario. $PM_{2.5}$ concentration during current operations are predicted to be approaching the criterion at the nearest surrounding sensitive receptor.

The annual average $PM_{2.5}$ concentrations are predicted to be well below the criterion of 8 μg/m^3 at all identified sensitive receptor locations during the Operational Scenario and the Construction Scenario which is a decrease from currently predicted concentrations.

Overall the Assessment concludes that the Project is likely to provide a measurable improvement in air quality in the local area and it is considered unlikely that emissions to air from the Project will cause a significant contribution to any exceedances of the respective NSW OEH criteria for the pollutants assessed.

Dust lift off from Coal Wagons

The particulate emissions from loaded coal wagons are anticipated to have short range particulate impacts in close proximity to the rail line. Due to the varying nature of the shape and configuration of coal wagons and the wind conditions responsible for the wind erosion from the top of coal wagons, it is difficult to quantify the particulate emissions from a rail journey and the resultant impacts on sensitive receptors along the rail line.

The Assessment has reviewed a number of recent studies relating to particulate emissions arising from coal transport using the rail network. The following provides an overview of this review.

Queensland Rail undertook an extensive study into particulate emissions arising from coal transport using rail network (Connell Hatch 2008). The aim of the report was to identify, quantify and mitigate the particulate emission sources from rolling stock operations within the Central Queensland Coal Industry (CQCI).

Specifically, the identified sources of particulate matter emissions from trains are:

- The coal surface of loaded wagons;
- Leakage of coal from doors of loaded wagons;
- Wind erosion of spilled coal in the corridor; and
- Leakage of residual coal from doors of unloaded wagons.

The best practice measures identified by Connell Hatch (2008) to control particulate emissions from rail corridors include:

- Use of profilers to manage overloading or underloading of wagons;
- Maintain a consistent profile (Loading via front-end loaders and clam shells produces uneven loads that are susceptible to spillage and reduce the effectiveness of suppressants);
- Maintaining the 100 mm freeboard around the edge of the wagon;
- Application of a suppressant to the surface of the coal profile;
- Removing parasitic coal from the surface of the wagons before leaving the mine site;
- Covering load (e.g. tarpaulins or lid); and
- Wagon wheel wash.

Further to the study by Connell Hatch (2008), Katestone Environmental Pty Ltd (Katestone) performed a study of dust emissions resulting from the rail transportation of coal from the Duralie coal mine situated in the Gloucester Valley, NSW (Katestone, 2012). The study was commissioned by Duralie Coal Pty Ltd (DCPL) in accordance with an Environmental Protection Licence requirement.

As part of the Katestone (2012) study, a detailed peer review was performed of the air quality assessment of coal transport by rail, prepared by SLR Consulting (previously Heggies, 2009). The peer review concluded that:

- The quantification of dust emissions from coal wagons was consistent with contemporary practice and provided a conservative estimation of potential emissions of coal dust. An added level of conservatism in the study was the assumption that no watering of the coal wagon surface would occur prior to train departure.
- Findings were consistent with those from similar studies conducted in Queensland, allowing for differences in rail traffic.

The overall modelled outcome was stated as likely to be very conservative, given that emissions reductions associated with watering had not been taken into account.

Relevant information relating to the transportation of coal from the Lidsdale Siding Loading Facility Project and associated information from the Duralie Coal Project are presented in **Table 20**.

Table 20: Comparison of Coal Transport by Rail – Lidsdale Siding Facility Project and Duralie Coal Project

Project Element	Duralie Coal Project	Lidsdale Siding Facility Upgrade
Number of Trains per Day	4 (average)	7 (max) 5 (average)
Number of Days Operation per Year	365	365
Number of Hours Operation per Day	Up to 20	Up to 24
Coal Transported by Train per Year	3 Mt	6.3 Mt
Net Tonnage of Train	2,500 t	3,800 t
Number of Wagons per Train	38	52

The findings of the quantification of coal dust emissions from rail wagons for the Duralie Coal Project are presented in **Table 21** in conjunction with the calculated emissions (g/km) calculated using the technique outlined in the Duralie Coal Project Environmental Assessment (DCPL, 2009). Concentrations of particulate (TSP and PM_{10}) near the rail line are calculated on a pro-rata basis using calculated emissions and predicted concentrations from the Duralie Coal Project Environmental Assessment.

Table 21: Calculated TSP and PM_{10} Emissions and Associated Concentrations at Track Side

Project Element	Duralie Coal Project	Lidsdale Siding Facility Upgrade
Calculated TSP emission (g/km)	369	561
Calculated PM_{10} emission (g/km)	184.5	280.5
Maximum Predicted 24hr TSP Concentration	14 $\mu g/m^3$ close to release point 1.6 $\mu g/m^3$ 100 m from trackside	21 $\mu g/m^3$ close to release point 2.4 $\mu g/m^3$ 100 m from trackside
Maximum Predicted 24hr PM_{10} Concentration	7 $\mu g/m^3$ close to release point 4 $\mu g/m^3$ 20 m from trackside 0.8 $\mu g/m^3$ 100 m from trackside	11 $\mu g/m^3$ close to release point 6 $\mu g/m^3$ 20 m from trackside 1.2 $\mu g/m^3$ 100 m from trackside
Calculated TSP emission (g/km)	369	561
Calculated PM_{10} emission (g/km)	184.5	280.5

Concentrations of PM_{10} associated with the transport of coal by rail from the Lidsdale Siding Facility Upgrade are anticipated to be of the order of 6 $\mu g/m^3$ at 20 m from the rail centre line. As previously discussed, the calculation of emissions from rail wagons was identified by Katestone (2012) as being very conservative and therefore it may be considered that concentrations of particulate matter at the railtrack side may be significantly lower than this in reality.

Further to the conservative approach in emission calculation adopted, a number of other factors will act to reduce the emission of particulate. These include:

- The use of the train loader which will produce a low and even profile of coal on the surface of the wagon. This will act to reduce particulate emissions;
- Using a train loader (rather than several FEL's) to load wagons will reduce spillages and therefore reduce the parasitic load;
- Coal loaded at the Lidsdale Siding Facility already contains a high inherent moisture (8%) which will act to suppress dust emissions; and,

Between 1 and 3 of the 5 on average trains per day will be the new Centennial owned units. These wagons have a more aerodynamic profile than those used elsewhere on the network which will also act to reduce particulate emissions.

The effects of the above measures are not quantifiable at the present time, however Centennial Coal are currently designing and implementing a site specific study to determine the characteristics of coal being transported off-site. The study will determine the Dust Extinction Moisture (DEM) level of the coal as it is transported from Lidsdale Siding. The DEM is defined as the moisture level at which dust is reduced to a level of 10 (Dust Number). At the determined moisture level for the coal type, only minor dust emissions could be expected during bulk handling operations. For example, if the DEM of coal is 5% and the actual moisture content of coal is >5%, the emissions of particulate matter during bulk handling would be negligible.

Furthermore, tests will also be performed to assess the likely dust lift-off from coal wagons for (at a minimum) an untreated coal surface and a coal surface treated with water. These tests will allow a quantification of the likely particulate matter emissions from each coal surface type and also identify the efficacy of dust mitigation measures over the likely time of transport from site to Port.

Results of the above testing program will be submitted within 3 weeks of receipt of laboratory data. The testing program is currently being designed.

8.4.2.4 Mitigation

The dust mitigation strategies that will be implemented are:

- Preparation of an Air Quality Management Plan as part of an overall CEMP
- Design and implementation of a site specific study to determine the characteristics of coal being transported off-site. The study will determine the Dust Extinction Moisture (DEM) level of the coal as it is transported from the Project Site. This study will allow a quantification of the likely particulate matter emissions from each coal surface type and also identify the efficacy of dust mitigation measures over the likely time of transport from site to Port and may result in further mitigation measures for the control of dust from rail transport.
- Water sprays will be located on the main stockpile to reduce particulate emissions due to wind erosion.
- Water sprays will be located at the coal transfer point.
- Completion of the Environment Protection Licence and Pollution Reduction Program and implementation of recommended actions.

8.4.2.5 Residual Impacts

Dust lift off from Coal Wagons is likely to be the main residual consequence of the Project. Centennial are undertaking a site specific study to determine the characteristics of coal being transported off-site. The study will determine the Dust Extinction Moisture (DEM) level of the coal as it is transported from the Project Site, identify the efficacy of dust mitigation measures over the likely time of transport from site to Port and may result in further mitigation measures for the control of dust from rail transport.

8.4.3 Greenhouse Gas

8.4.3.1 Introduction

SLR Consulting was commissioned by Centennial to prepare a Greenhouse Gas Assessment for the Project. A copy of the Assessment, including an Air Quality Impact Assessment, is contained within **Appendix 3** of the EA. The DGR's for the Project require the following to be performed in relation to greenhouse gas (GHG) emissions:

- A quantitative assessment of potential Scope 1 (Direct GHG Emissions), 2 (Electricity indirect GHG Emissions) and 3 (Other indirect GHG Emissions;
- A qualitative assessment of the potential impacts of these emissions on the environment; and,
- An assessment of reasonable and feasible measures to minimise GHG emissions and ensure energy efficiency.

The Assessment has been performed with reference to the Australian Department of Climate Change and Energy Efficiency (DCCEE) document "National Greenhouse Accounts Factors" (July, 2011), the NSW Department of Energy, Utilities and Sustainability (DEUS) document "Guidelines for Energy Savings Action Plans" (2005), as required by the DGR's and the National Greenhouse and Energy Reporting Act 2007, the Centennial Coal Greenhouse Gas Assessment Guidance Notes (Centennial Coal, 2010) and Climate Change Response Policy (Centennial Coal, 2012b).

Significant findings and recommendations from the Assessment relating to Greenhouse Gas are summarised below.

8.4.3.2 Existing Situation

Calculated Scope 1, Scope 2 and Scope 3 emissions of greenhouse gas resulting from the emission sources for current operations, based upon observations from July 2010 to June 2011 are presented in **Table 22** below.

Table 22: Summary of Scope 1, 2 and 3 GHG Emissions – Current Operations

Source	Emissions (tonnes CO_2-e) Current Operations
Scope 1	
Diesel Combustion (on-site)	1,642
Scope 1 Subtotal	**1,642**
Scope 2	
Electricity Consumption	175
Scope 2 Subtotal	**175**
Scope 1 and 2 Combined Subtotal	**1,817**
Scope 3	
Diesel Combustion (on-site)	125
Diesel Combustion (off-site)	397
Electricity Consumption	33
Employee Travel	8
Scope 3 Subtotal	**563**
Total Scope 1, 2 and 3	**2,381**

8.4.3.3 Construction Impact Assessment

During the construction phase of the Project the existing facilities will be largely operating as normal. Reduced emissions as a result of “down time” of the facilities in order to see completion of critical construction components are likely to offset additional emissions generated as a result of the construction phase.

8.4.3.4 Operation Impact Assessment

Calculated Scope 1, Scope 2 and Scope 3 emissions of greenhouse gas resulting from the emission sources for the Project and compared against current operations are presented in **Table 23** below.

Table 23: Potential Project Greenhouse Gas Emissions during construction

Source	Emissions (tonnes CO_2-e)	
	Current Operations	Proposed Operations
Scope 1		
Diesel Combustion (on-site)	1,642	162
Scope 1 Subtotal	**1,642**	**162**
Scope 2		
Electricity Consumption	175	1,074
Scope 2 Subtotal	**175**	**1,074**
Scope 1 and 2 Combined Subtotal	**1,817**	**1,236**
Scope 3		
Diesel Combustion (on-site)	125	12
Diesel Combustion (off-site)	397	1,970
Electricity Consumption	33	205
Employee Travel	8	5
Scope 3 Subtotal	**563**	**2,193**
Total Scope 1, 2 and 3	**2,381**	**3,429**

Direct (Scope 1) GHG emissions (CO2-e) resulting from the Project operations are estimated to be 162 tpa, a decrease of approximately 1,480 tpa on current operations. Indirect (Scope 2) GHG emissions (CO2-e) resulting from Project operations are estimated to be 1,074 tpa, an increase of approximately 899 tpa on current operations.

Increased emissions of GHG are widely accepted to exert a warming influence on climate. Increasing concentrations of the long-lived GHG's (CO2, CH4, N2O, halocarbons and SF6 (LLGHGs) have led to a combined radiative forcing (RF) of +2.63 [±0.26] Watts per square metre (W m–2). A 9% increase in this RF since the publication of the Third Assessment Report of the IPCC (IPCC, 2001) is the result of concentration changes since 1998 (IPCC, 2007). The IPCC state that it is very likely that there has been a substantial anthropogenic (man-made) contribution to surface temperature increases in every continent except Antarctica since the middle of the 20th Century, although difficulties exist in the attribution of temperature changes on smaller than continental scales and on timescales of less than 50 years.

Scientists at the 2005 conference, 'Avoiding Dangerous Climate Change: Symposium on Stabilisation of Greenhouse Gases' concluded that at the level of 550 parts per million (ppm) CO2 concentration, a 2°C increase in global mean temperature above present levels would be experienced, and that stabilisation at a concentration of 400 ppm would be necessary to avoid a 2°C warming. IPCC reports (IPCC, 2007) have suggested that stabilising concentrations at 450 ppm by 2020 would only result in a 50% likelihood of limiting global warming to 2°C.

The linkages between emissions of CO2 from an individual project, resulting global CO2 concentrations and climate warming is not possible due to a host of uncertainties and a lag in the climate system. However, action by National Governments aimed at reducing GHG emissions by sector and national totals will result in mitigation of climate change, and accurate quantification of GHG emissions will aid the ongoing assessment of climate impacts and will reduce the impact on global climate warming influenced by all countries.

8.4.3.5 Mitigation

Centennial is currently implementing a number of measures to minimise to the greatest extent practicable GHG emissions from operations. Relevant measures are described below:

- Maximising energy efficiency as a key consideration in the operation of the Project. For example, significant savings of greenhouse gas emissions (through increased energy efficiency) are achieved by planning decisions.
- The Project Site has developed and implemented an Energy and Greenhouse Management System and monitors and reports energy usage at the Project Site. KPI's including energy demand and GHG emissions per tonne of coal transported off-site are tracked. For example, the current operations result in an emission of 1.4 kg of CO2-e (Scope 1 and 2) per tonne of coal transported and the modified operations are predicted to result in an increased efficiency of 0.2 kg CO2-e per tonne of coal transported. These figures will be tracked each year.

Additional measures that Centennial are striving to achieve include:

- Identify and implement cost effective measures to improve energy efficiency;
- Regular maintenance of plant and equipment to minimise fuel consumption; and
- Consideration of energy efficiency in plant and equipment selection/phase.

Centennial is currently investigating at a corporate level the measures which may be taken to offset Scope 1 emissions from their operations. This work is ongoing, but measures may include (but not limited to) alignment with biodiversity offsets, purchase of greenpower and switching to biodiesel fuel if considered feasible. These measures are being investigated and all measures taken to offset GHG emissions associated with the Project will be in alignment with the objectives of the Clean Energy Future.

8.4.3.6 Residual Impacts

Residual consequences will be minimised provided that the mitigation measures identified above are implemented.

8.4.4 Surface Water

8.4.4.1 Introduction

RPS Aquaterra was engaged by Centennial to undertake a Surface Water Impact and Water Balance Assessment for the Project. A copy of the Assessment is contained in **Appendix 4**. Significant findings and recommendations from the Assessment are summarised below.

8.4.4.2 Existing Situation

The existing water quality in ephemeral creeks and site water management infrastructure within the Project Site and broader study area has been compared to the guidelines for assessing water suitability for streams as presented in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2000 (ANZECC, 2000). The Assessment has determined that raw surface water sources, which are available for use at the site include licensed surface and groundwater extraction, harvestable rainfall, clean surface run-off and municipal supply. Water is also sourced from the site's stormwater system, stockpile runoff and from excess truck wash down.

The Project Site has a tri-staged surface water catchment, containment and passive treatment process. Settled water is discharged under licence into the Pipers Flat Creek via a stormwater drainage channel if

required, at licensed discharge point LDP004, approximately 200m south-west of the Coxs River confluence. Under normal weather conditions, water generally does not discharge from the site.

Water quality at and surrounding the Project Site has been generally fair as represented in surface water monitoring results. Poorer water quality is associated with containment ponds located on site or presumably as a result of very high rainfall, which led to localised flooding water flows throughout the region in December 2010.

Water recycling is and will continue to be a key component of the site water balance. Opportunities will be taken to maximise (within constraints of approved licences) the uptake of water from groundwater, the Creek, the interception of polluted surface runoff and sump pumps, the reuse of water from washing facilities and the minimise of unnecessary water use. This would contribute to minimising the need to obtain additional makeup water.

Modelling and assessment of the potential surface water of the Project and the potential flood impacts has revealed that significant high rainfall events have been the main cause of major flooding in the region in 1950, 1986, 1991 and 2010. Anecdotal evidence provided by site personnel indicates that a small portion of the Project Site was submerged (by up to 2m) during the 2010 flood event. This flooding affected the ability to operate for a short period of time. The flood impact from a water perspective was the overtopping of and quick movement of water through pollution containment ponds, thereby increasing the quantity, and decreasing the quality of discharge over the short-term. The infrastructure on site was largely unaffected, with the exception of inundation of the workshop floor.

Pipers Flat Creek was diverted to the north of the rail line in the 1950s to accommodate the siding and move water away from infrastructure. It appears from current drainage lines that the original course of the Pipers Flat Creek ran either nearby or through the Project Site (from the south-west) and is likely to be a contributing factor to site flooding. Improvements in minor flood flows could be provided by the removal of existing Willow trees.

8.4.4.3 Construction Impact Assessment

A surface water related impact that is likely during the construction phase is erosion. Potential impacts which may arise from this include:

- Contamination and sedimentation of onsite containment ponds, culverts, drainage structures and water resources in the immediate vicinity.
- Potential decrease in water quality as a result of surface water runoff.

8.4.4.4 Operation Impact Assessment

Surface water related aspects which have the potential to occur during the operation of the Project are outlined below:

- the recycling of water around the site (through pipes and via natural shallow underground / surface flow mechanisms) may progressively increase salinity levels and promote the mobilisation of contaminants over time.
- contaminated water passing through the Project Site and broader study area has the potential to accumulate on the surface (increasing in salinity) and also mix with shallow groundwater prior to draining back to the main pollution control pond for reuse.
- the impact of widespread flooding or a sustained rainfall event has the potential to transfer significant quantities of surface water through the pond system resulting in a reduction in the total residence time for settlement and an increase in the total amount of suspended material being discharged.
- accidental spills and leaks entering the site surface water reuse system.

- raw water use from Creek at various stages of the process. New conditions may potentially be applied to the existing licence following its conversion to a Water Access Licence under the *Water Management Act 2000*.
- windborne coal/road dust has the potential to mobilise around the facility. This material is collected by surface water runoff and is transported to the containment ponds, then potentially (post settling) to nearby watercourses.
- encroachment of Pipers Flat Creek floodwaters on to the site via the western corner. Encroachment is potentially due to an historical diversion of the Creek to the north of the site and from willow trees partially blocking efficient Creek flow. Sedimentation of the Creek's confluence with the Coxs River has developed over time from offsite erosion resultant from some overgrazing and land clearing.
- the Railway Culvert which runs under the railway line and flows into Pipers Flat Creek, is subject to flow back up from the Creek during flood events.
- water supply and demand varies depending on climatic conditions and needs to suppress dust on roads and coal stockpiles.
- the natural drainage from the site and surrounding sub-catchment area for Pipers Flat Creek is compromised due to the location of the site (historical), Creek diversion and capturing of surface runoff (from on and parts of surrounding area).
- use of raw 'clean' water resources.
- off-site water from the property located to the south (adjacent to the main entrance, between rail site and Main Road) pools behind the tree-lined visual/acoustic bund that extends in a "dog-leg" shape across the southern perimeter. This temporarily ponded water poses a nuisance to neighbouring properties.
- a gap in the bund tends to discharge uncontrolled stormwater across the site and occasionally through the workshop area before it drains towards the main pollution control pond.
- sedimentation of ponds and basins reduces their capacity.

8.4.4.5 Mitigation

Mitigation measures during the construction phase will include:

- A detailed site water management plan and erosion and sediment control plan will be prepared prior to construction and operational activities. These plans will be compliant with all applicable Project Approval conditions, EA commitments and Environmental Protection Licence requirements
- Contaminated water is contained within the site boundary through stormwater catch drains and moved towards the containment ponds
- If during the construction phase significant surface water is encountered (i.e. following a sustained rainfall event). Surface water sampling and analysis (pH, EC and TSS) may be deemed necessary prior to containment
- Erosion and sediment controls will also be implemented as per Managing Urban Stormwater: soils and construction (Landcom, 2004)

Mitigation measures during the operation phase will include:

- Storage and use of contaminated water:
  - » rigorous maintenance checks be conducted and higher grades of mechanical equipment be utilised across the facility to reduce downtime and increase the efficiency of the water management system.
  - » the water management system will also be compliant with the Managing Urban Stormwater: treatment techniques (DECCW/EPA) and Managing Urban Stormwater: source control (DECCW) handbooks.

- Discharge of treated water from site:
  - the installation of a weir and automated sampling and/or notification equipment at the discharge point (LDP004) is planned to be installed in 2012.
- Waste Water disposal:
  - a new ablution block will be built prior to Project construction activities. The effluent from the ablution block will enter a septic tank and will be removed from site (pumped out) as required

    Note: Septic tank waste shall not be used for irrigation or reused on site. All waste options to be approved by Lithgow City Council before construction.
- Use of groundwater from the production bore (PB1)
  - Routine quarterly water quality monitoring in the main pollution control pond and representative samples obtained from the production bore (PB1).
- Storage and use of chemicals/ fuel on site:
  - the management of chemicals, fuel and potential spills to be undertaken in accordance with *Technical Guidelines: Bunding & Spill Management (DECCW)*
  - routine monitoring of water in the Triangle Pond should continue as per water quality monitoring schedule.
- Use of Pipers Flat Creek water:
  - a detailed site water management plan, which has a focus on sustainability and adaptive management shall be developed prior to construction and ongoing operations.
- Coal stockpiles and compacted coal reject:
  - sprinklers and water carts to be used when necessary to manage dust impacts;
  - excess water will be used to maintain the water balance to reduce the incidence of licensed discharge.
- Coal spillage on ground (north-west side of rail):
  - the ground will be cleared of coaly material and will be maintained in a 'clean' state to enable raw water runoff
  - a low bund and drain inside the boundary fence to be constructed, to divert water into two or more small sediment detention basins strategically located in low-lying areas near each end
  - the ground will be contoured so water can drain under the railway line and over/under the internal road towards the main pollution control pond;
- Location of project
  - invasive willow trees to be removed from the incised channel reaches within the Study Area. Particularly in the north-west in the bend near to the 'Railway Culvert'. The removal of invasive species will be undertaken with the advice of and/or in collaboration with the Hawkesbury-Nepean Catchment Management Authority (HNCMA).
- Visual/acoustic bunds around site
  - to maintain drainage lines around the southern outer edges of the bunds the ground surface will be kept clear of debris 2m from the toe of the embankment (provide a drainage 'clear way')
  - a sub-surface (wide diameter pipe) and/or surface (trench/depression with road grid) drainage line will be constructed to direct water from the gap in the bund wall so that it flows past the workshops and under/over the road towards the main pollution control pond.

- Ponds and Sediment Detention Basins
  - » in the case of the sediment detention basins on the north-west side of the rail, any coaly sediment will be removed so as to keep any overflowing water clean.

8.4.4.6 Residual Impacts

Residual impacts from the construction phase could include:

- high intensity rainfall events may cause increased erosion and sedimentation of stormwater drains and ponds as well as the nearby Pipers Flat Creek and Coxs River.

Residual impacts from the operation phase may include:

- Storage and use of contaminated water:
  - » rigorous maintenance checks should be conducted routinely in order to assess the suitability and efficiency of the management system.
- Discharge of treated water from site:
  - » major flooding would flow through the site without prior control of potential pollutants.
  - » potential for installed monitoring equipment to fail.
- Use of Pipers Flat Creek water
  - » extended periods of drought may decrease allowable water extraction volumes and the provision of water supply from offsite sources.
- Site infrastructure:
  - » some sections of the conveyor belt in the loading tunnel below the stockpile could be affected by possible accumulation of sediment in the tunnel after floods.
  - » the sediment will be removed and the conveyors serviced in order to resume production. Loading using vehicles can be used to maintain production.
- Visual/acoustic bunds around site:
  - » potential remains for drainage lines and 'clear ways' to be blocked. Ongoing maintenance and minor grading will be undertaken as required.
- Ponds and Sediment Detention Basins:
  - » flooding type situations may rapidly increase the sedimentation of ponds and basins.

8.4.5 Groundwater

8.4.5.1 Introduction

RPS Aquaterra was engaged by Centennial to undertake a Groundwater Assessment for the Project Site. A copy of the Groundwater Assessment is contained within **Appendix 5**.

The Assessment has been designed to provide sufficient information on the existing groundwater environment within the Project Site, the broader study area and its surrounds and thereby assess the potential impacts of the Project on groundwater, surface water, groundwater dependent ecosystems (GDEs) and existing groundwater users, and to develop appropriate management and mitigation strategies. Significant findings and recommendations from the Groundwater Assessment are summarised below.

8.4.5.2 Existing Situation

Information on registered groundwater users within and close to the proposed development was collated through a search of the NSW Office of Water groundwater bore database. The database revealed 38 registered bores and wells within a 5km radius of the Project Site. The bores are mostly private bores, installed for domestic and stock purposes and monitoring. Six bores are installed for power generation, recreational and water conservation use. The water quality is not recorded except in nine bores and it is mainly reported as being good. The bore yield reported for a limited number of bores is relatively low and in the range from 0.5L/s to 2.5L/s.

Most sites had bores and wells installed in sandstone and shale, with a small number installed in diorite, granite and coal. Over 70% of private bores are shallow (<50m depth), with a small number installed to depths between 50 and 90m below ground.

The primary water bearing zones within the broader study area are associated with the weathered shale and shallow alluvium. The fresh shale is known to be of low permeability and is not classified as aquifer.

Elsewhere in the broader study area, groundwater is known to occur within the coal seams and weathered sandstone, siltstone and shale of the basement Shoalhaven group although low yields are recorded. The thickness of the Shoalhaven group sediments is greater than 50metres. Groundwater within the coal measures is typically associated with secondary permeability features such as cleat fractures, joints, fractures and major bedding structures. The overall permeability and porosity of the coal measures rock matrix is typically very low.

No groundwater dependent ecosystems have been identified in the Project Site or the broader study area.

8.4.5.3 Construction Impact Assessment

A numerical groundwater model was set up for the Project as there are no known groundwater models that cover this area. The semi-regional model was set up to simulate groundwater conditions over a 64km^2 area, to encompass the area of potential impact from the Project and allow for potential future cumulative impact assessments. Having achieved acceptable calibration of the model, the model was then applied to predictive transient modelling.

The groundwater conditions at 2011 derived from results of the transient calibration were used as the initial conditions for prediction modelling. The predictive model was run using two time slice models for the period of three months each, with a one-month stress period for each three-month time slice.

The predicted inflow rates are summarised in **Table 24** below.

Table 24: Predicted Reclaim Tunnel Inflow Rates

Excavation and tunnel development (month)	Average Inflow (m^3/day)	Cumulative Volume (m^3)
1	7.2	218
2	12.4	591
3	26.9	1400
4	<0.1	1400
5	<0.1	1400
6	<0.1	1400

During the initial 3 months of excavation there is predicted to be an increase in the water inflow into the trench as it progresses deeper and intercepts groundwater. Once the construction of the tunnel commences the hydraulic conductivity would decrease due to concrete blocks and backfill, and the inflow would subsequently cease.

The highest water inflows are predicted to occur in the second and third month, as excavation continues deeper.

During the initial construction period of the Project, it is proposed to excavate the trench in stages and then progress with placement of the concrete lining.

During this period there would be interception of groundwater in particular as the excavation progress below the water table at around 1.5m depth. The inflows would mainly occur during the first three months of excavation and would reduce to minor seepage following the placement of the concrete lining. There would be a neutral impact on surface water quality and quantity. In relation to potential impacts during the construction phase of the project these are assessed as being in accordance with the State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 as having a neutral effect and NSW State Groundwater Policy Framework Document (DLWC, 1997).

8.4.5.4 Operation Impact Assessment

During operation, groundwater volumes collected in the reclaim tunnel would be minimal as the tunnel will be fully concrete lined. There would be no impact of dewatering on the other aquifers on water quantity and quality of the Coxs River downstream.

During operations, any surface water from the catchment would be diverted away from disturbed areas thereby preventing any potential mixing with groundwater. Moreover, the clean runoff would be of a better water quality than the groundwater contained within the shallow aquifer.

8.4.5.5 Mitigation

Mitigation measures during the construction phase will include:

- Implementation of a groundwater management plan as part of the Construction Environmental Management Plan; and
- Application for a water extraction licence, for the construction period, and adhere to any specific conditions of the licence.

The following mitigation measures have been identified by RPS Aquaterra to be implemented if impacts on creeks, ecosystems and groundwater users related to activities associated with the Project are demonstrated to be greater than anticipated:

- assess the significance of the impact
- Investigate measures to minimise the impacts
- describe what measures will be implemented to reduce, minimise, mitigate or remediate these impacts to the satisfaction of the EPA / NOW.

If a non-conformance with the trigger criteria set out within the Groundwater Assessment is determined to be result of the activities associated with the Project NOW would be notified and a remediation strategy will be proposed and implemented.

Contingency procedures will be activated following the assessment of groundwater monitoring results in light of the triggers outlined above, including groundwater levels and groundwater quality.

To reduce the potential for impacts on groundwater chemistry, oils, fuels and lubricants will be stored in an appropriate manner and any spillages/leaks will be managed and reported in line with a groundwater management plan and in accordance with Guidelines for the Assessment and Management of Groundwater Contamination (OEH, 2007).

8.4.5.6 Residual Impacts

There are considered to be no residual impacts provided that the mitigation measures identified above are implemented.

8.4.6 Contamination

8.4.6.1 Introduction

AECOM Australia (AECOM) was engaged by Centennial to undertake a Site Contamination Assessment for the Project. A copy of the Assessment is contained in **Appendix 6** and significant findings and recommendations from the Assessment are summarised below.

8.4.6.2 Existing Situation

In 2009, AECOM conducted a Contamination Investigation of the Project Site to identify whether past and current practices resulted in contamination of soil and groundwater. The findings of this investigation identified hydrocarbon related contamination of soil and groundwater in the vicinity of the workshop, plant parking area and adjacent to the former above ground storage tank. The investigation indicated that the identified contamination was not migrating from the Project Site and was not subsequently affecting the water quality within the adjacent Piper Flat Creek. The current Assessment, as contained in **Appendix 6**, updates the 2009 assessment in light of the DGRs issued for the Project by the DOPI on 31 January 2012.

The scope of work undertaken for the Site Contamination Assessment comprises:

- site inspection and underground service clearance
- groundwater level gauging and sampling of the six existing monitoring wells (MW) (MW01 to MW06), refer to **Figure 8**, installed by AECOM in 2009 and the production well, located in the vicinity of the Dirty Water Dam
- collection of soil samples from six (6) borehole locations installed using a hand auger
- collection of two (2) sediment samples from the dirty water dam and the silt trap adjacent to Pipers Flat Creek
- soil, sediment, and groundwater sample analysis by a NATA accredited laboratory for the identified contaminants of concern
- review of current and historical groundwater and surface water analytical results from the routine quarterly sampling conducted by Australian Laboratories Services Environmental (ALS) on behalf of Centennial, at the facility
- data analysis and reporting.

Observed conditions within the Project Site comprised of fill materials ranging in depth from the ground surface to 1.1 metre below ground surface (bgs), underlain by depositional sediments comprising layers of sand, gravelly sand and silt. There was no perched water or groundwater encountered during drilling.

Heavy end petroleum hydrocarbon impacted soil in two areas, namely beneath the Locomotive Fuelling Area (to depth of 1.1 m bgl) and adjacent to the Workshop (to a depth of 1.1 m bgl), with the vertical extent of the contamination not assessed as part of this investigation. No surface contamination was evident on the surface of the locomotive fuelling area. The source of the contamination is likely to be diesel, however it does not appear to be from the mobile fuelling activities in this area as there is no evidence of staining and the mobile refuelling operation has only recently commenced.

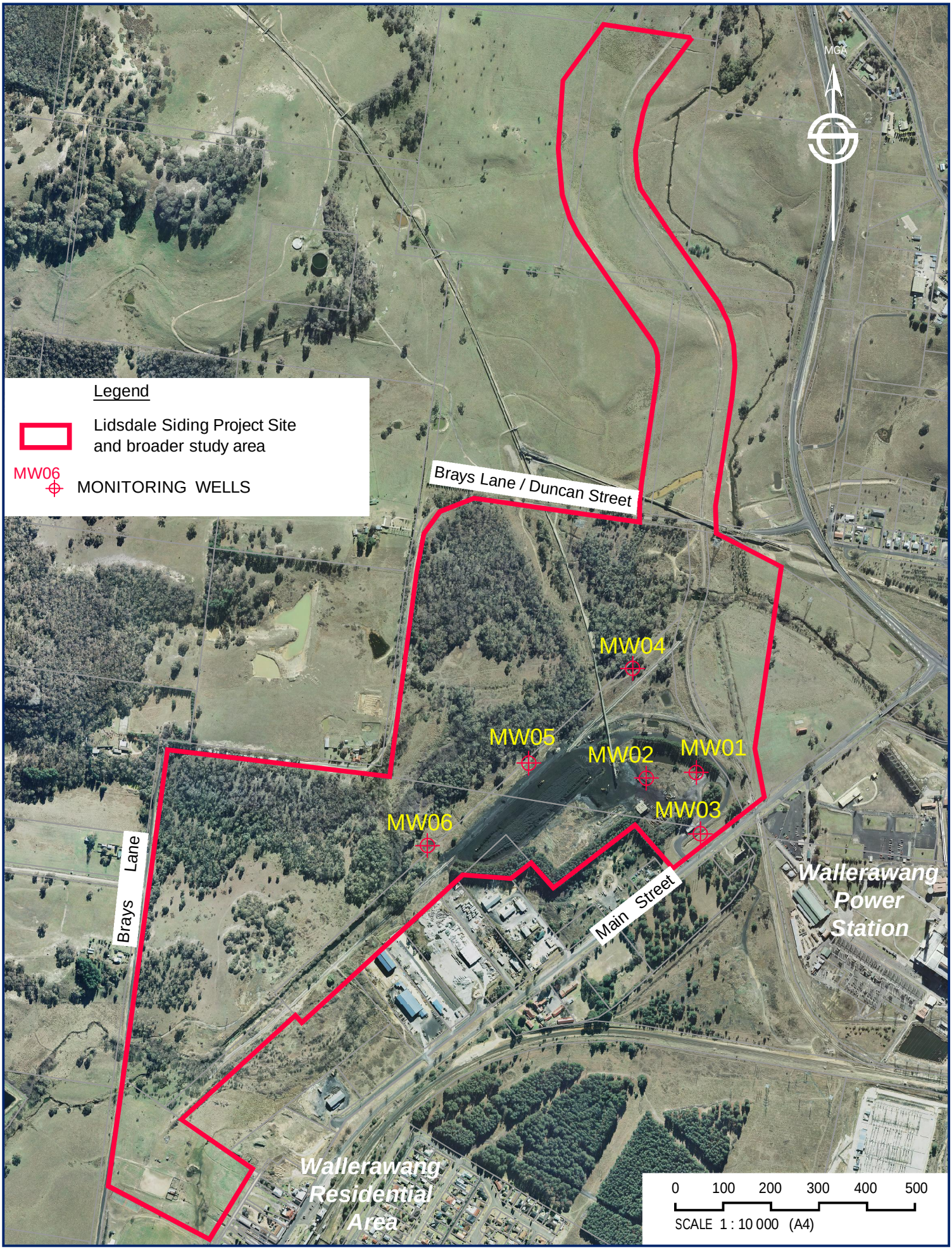

FIGURE 8

TITLE: **Lidsdale Siding Upgrade Project** MONITORING WELLS LOCATION | LOCATION: WALLERAWANG | DATUM: (GDA 94) | PROJECTION: PROJECT AREA | DATE: 22ND AUG 2012 | PURPOSE: ENV ASSESSMENT | CAD REF: **110912 Upgrades to Project Ar** | VERSION: Monitoring Wells

CLIENT: CENTENNIAL COAL
JOB REF: 110912

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RPS

Heavy metals including nickel, copper and zinc were detected in some groundwater samples collected at the site at concentrations exceeding the groundwater assessment criteria. The elevated zinc concentrations were similar in order of magnitude and widespread across the Site, and are likely to be indicative of background conditions. The presence of slightly elevated concentrations of copper in MW01, nickel in MW04 and copper and nickel in the Production Bore are likely to be due to natural low pH levels recorded during the investigation. These metal concentrations are consistent with those collected during the previous groundwater investigation carried out by AECOM in 2009.

TPH impact was identified in groundwater at MW01, located adjacent to the former AST, and in the Production Bore. Assessment of the analytical chromatogram has identified the hydrocarbons detected as representative of diesel. The source of the impacted groundwater may be from a spill/leak from the former above ground storage tank and/or from a nearby drain which was observed during the Site works to contain sediments with a strong hydrocarbon odour and is understood to be blocked. The drain, if operational, appears to drain from the southeast to the northwest towards the dirty water dam.

Quarterly monitoring reported lower concentrations of TPH (C15-C28 and C29-C36) in the groundwater at Bore02 (MW02) and the Production Bore, which is slightly down gradient of MW01, indicating that the TPH impacted groundwater extends towards the dirty water dam. However, groundwater samples collected from MW04, located at the down-gradient boundary of the site did not report the presence of TPH, indicating that TPH impacted groundwater is not migrating off-site. This is also further supported by the quarterly monitoring results of the groundwater and surface water sampling events, conducted by ALS, which did not identify hydrocarbons in groundwater adjacent to Pipers Flat Creek or in the Creek itself.

A site inspection was conducted on 19 December 2011 by a Principal Environmental Scientist of AECOM. Potential areas of contamination based on the findings of the previous Phase 1 ESA (Connell Hatch 2009), Contamination Investigation (AECOM 2009) and the December 2011 site inspection are considered to include the following:

- the area in the vicinity of the former above ground storage tank (AST) where petroleum hydrocarbon contamination was previously found in the soils and groundwater, and it is understood that the soils and groundwater have not been remediated following removal of the petroleum storage infrastructure
- the workshop and plant parking area where petroleum hydrocarbon contamination was found in the soils (AECOM, 2009).
- locomotive fuelling area
- truck wash area
- adjacent industrial properties
- rail sidings
- substation located in rail container in equipment storage area
- a layer of ash fill material of unknown origin reportedly identified during previous investigations (Macquarie, 2008) at the site.

The contaminants of concern related to these potential sources comprise:

- heavy metals – which may occur in fill originating from industrial sites and from the use of fuels. Common metal contaminants include arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc
- petroleum hydrocarbons – which occur in fuels, solvents and oils etc. Petroleum hydrocarbons are generally quantified by analytical laboratories as TPH, and as four fractions of hydrocarbons grouped into ranges of volatility
- Monocyclic Aromatic Hydrocarbons – including BTEX are found in fuels and used as solvents

- PAH – related to petroleum hydrocarbon use, waste, lubricating oils and coal/ash. PAHs are also potentially present in fill (dependant on the origin of the fill material)
- polychlorinated biphenyls (PCBs) – may be present in the oils historically used at the substation. PCBs have not been used in Australia since the 1970s
- pesticides – pesticides such as 'Round Up' are understood to have been used along the rail siding at the site
- asbestos – may be related to the use and subsequent weathering and damage of asbestos cement materials in building/machinery construction and may be present in imported fill. Asbestos may also be associated with former or older railway lines.

8.4.6.3 Construction Impact Assessment

The Project is unlikely to have an impact in relation to contamination matters during the construction phase provided that the mitigation measures as detailed are adhered to.

8.4.6.4 Operation Impact Assessment

The Project is unlikely to have an impact in relation to contamination matters during the operational phase provided that the mitigation measures as detailed are adhered to. Once the remediation measures have been implemented there will be a measurable reduction in site contamination.

8.4.6.5 Mitigation

The Project Site is considered suitable for the upgraded facility however further investigation works will be conducted to ensure the impact detected does not migrate off-site. Mitigation measures are outlined as follows:

- the TPH impacted soils identified at the workshop and in the vicinity of the Locomotive Fuelling Area will be delineated with Site Management practices at the Workshop improved to minimise any future spills of hydrocarbons.
- the area in the vicinity of the former AST should be further investigated to assess the source of the hydrocarbon impacted soils at depth and impacted groundwater in this part of the Site. Once identified, the source of the hydrocarbon impact should be removed with the groundwater remediated by natural attenuation, if assessed to be appropriate. The impacted groundwater does not appear to be migrating off-site; however ongoing monitoring of groundwater concentrations should continue to ensure there remains no impact down-gradient of the Site.
- the production bore construction should be altered so groundwater is not allowed to migrate between aquifers.

As part of the duty to report contamination requirements within the *Contaminated Land Management Act* within Centennial operations, Lidsdale Siding was reported to the OEH in February 2012. This notification outlined the program to develop management plans to undertake the remedial works identified above within the next five years.

8.4.6.6 Residual Impacts

There are no residual consequences provided that the mitigation measures identified above are implemented. Once the remediation plans have been implemented there will be a measurable reduction in site contamination.

8.4.7 Visual

RPS was engaged by Centennial to prepare a Visual Impact Assessment for the Project. A copy of the Assessment is contained in **Appendix 7**, and significant findings and recommendations from the Assessment are summarised below.

8.4.7.1 Introduction

The regional visual context of the Project Site and broader study area is characterised by:

- Wallerawang Power Station which is located to the southeast of the site
- industrial premises to the south west including bulk materials handling and manufacturing
- open forest immediately to the north of the site
- rural outlook further to the north and north west of the site
- the township of Wallerawang to the south west including a small central shopping area
- residential dwellings further to the south west
- rail infrastructure consisting of the main rail line which runs through the township of Wallerawang and immediately to the south of the power station
- road infrastructure including Main Street to the south, Castlereagh Highway to the east and minor roads including Brays Lane to the north of the site.

The Project Site is located in a relatively flat broad valley of the Coxs River and Pipers Flat Creek while elevated locations occur on the ridge to the north west associated with Ben Bullen State Forest and to the north east at Lidsdale township.

8.4.7.2 Existing Situation

The majority of the existing activities on the Project Site are currently screened from surrounding areas by vegetation. Mature pines approximately 20-25 metres in height provide a tall, dense screen around approximately half of the southern boundary of the site, screening the site borders adjacent to Main Street and the rail triangle. Native vegetation to the west of the site on land owned by NSW State Rail provides screening from Brays Lane.

Visual features of the Project Site include the overland conveyor, stockpiles, front end loaders and semi trailers, fencing and lighting although most of these elements are concealed by existing vegetation. Lights are located adjacent to the rail tracks on light poles for night time operations, as train loading occurs 24 hours a day.

There is also a private residence, a motel and a church located along Main Street, in close proximity to the Project Site. Other receptors include the industrial properties located adjacent to the site and residential and commercial properties located at Wallerawang and near the Castlereagh Highway, along Duncan Street.

The Lidsdale Siding has been in operation as a coal loading facility since 1974 while rail infrastructure has been a dominant feature of the local area for over 100 years.

Wallerawang Power Station is a dominant form in the landscape incorporating a large cooling tower, furnace stacks, substation and associated buildings. A number of 330 kV transmission towers are also located in the area.

8.4.7.3 Construction Impacts

Visual impacts associated with the construction of the facilities associated with the Project include crane operation and construction works at elevated heights, an increase in heavy vehicles and construction machinery, and additional fencing/signage. The majority of earthmoving equipment required during construction will not be visible as they will be shielded by existing tree screens however the cranes will be visible during erection of the conveyor and bin structures. Earthmoving equipment will be visible during the construction of the track extension however the impacts will be no greater than during the operation of the track. Construction impacts will be temporary and in general no greater than the existing or ongoing operation of the facility.

8.4.7.4 Operation Impacts

Visual impacts associated with the Project are likely to be more prominent once all components of the Project are constructed. The two main elements that are likely to be visible from some locations are the main elongated conical stockpile with additional conveyor section, and the rail bin and associated elevated conveyor.

Some shops and businesses along Main Street would have views of the proposed track extensions and when trains are present along the new section of track. Views of the trains in operation will be new and contrast against an otherwise agricultural landscape.

The main conical stockpile when at its maximum capacity would have a nominal height of 28 metres. The conveyor feeding the stockpile will be located above it, giving a total height of over 30 metres. The rail bin would be approximately 30 metres high with the conveyor feeding the bin rising to this height from ground level from the underground feeders beneath the main stockpile.

As part of the Project, lighting would be upgraded to provide both brighter and more directional lighting. Use of directional lighting will ensure minimal light spill from the Project Site, however lights may still be visible from surrounding areas but will not be intrusive. Lights will only be operated when required for train loading or maintenance activities.

8.4.7.5 Mitigation

Visual Impact of the Project is considered moderate. There would be a range of impact perceptions which warrant differing visual treatments. At the Wallerawang township end, the track extension will be more contrasting against the existing rural outlook while the more prominent visual elements such as the new rail loading bin is located in an existing industrial landscape.

In order to reduce the impacts on the Wallerawang Township, a visual screen will be planted as identified on the Project Components Plan in **Figure 4**. This screen will consist of native tree and shrub species comparable to the existing forested areas to the north of the site. The location of the screen may be elevated with fill generated during the construction works if excess is available and considered suitable for this purpose. As shown on **Figure 4**, the tree screen will run along Brays Lane and the boundary of Wallerawang Playing Fields and then extend along the middle ground between Blackberry Lane and the track extension. A second screen will be planted along the existing rail siding along the boundary with the industrial area. This screen will be an extension to the existing tree screen which runs around the main Siding facilities and loading area. The tree screens are located on land owned by Centennial Ivanhoe.

The Project also involves the progressive removal of Willows along the existing and previous alignment of Pipers Flat Creek. Where these Willows provide visual screening of the existing or future facilities, they will only be removed once replacement tree screening has been completed and is developing. Removal of the

Willows that provide some visual screening will therefore be the last to be removed in the weed eradication program and at least 5 years after the replacement screening trees have been planted.

The main conveyor and bin structures will be colour treated to reduce reflection and contrast against the existing backdrop. An appropriate colour will be determined during detailed design. The proposed mitigation measures will reduce but not eliminate the visual impacts of the Project.

8.4.7.6 Residual Impacts

The residual visual impacts are considered to be moderate however the visual absorption capacity of the area is relatively high in relation to coal handling and rail infrastructure given that these elements are common and historic to the area.

8.4.8 Traffic and Transport

8.4.8.1 Introduction

Barnson Pty Ltd was engaged by Centennial to undertake a Traffic and Rail Impact Assessment for the Project. The Assessment reviews the potential impacts on traffic and on the safety and efficiency of the rail networks including relevant railway crossings. A copy of the Assessment is contained with **Appendix 8** and significant findings and recommendations from the Assessment are summarised below.

8.4.8.2 Existing Situation

Existing traffic volumes

The Annual Average Daily Traffic (AADT) on the Castlereagh Highway south of the Boulder Road intersection is 4,300 vpd* (vehicles per day), including 17% heavy vehicles. The average hourly rate is therefore 430 vph (vehicles per hour). (Mr Neil Peden, RSTM Western Region)

The Lidsdale Siding currently employs 15-20 permanent staff and contractors. This corresponds to 30 vpd (light vehicles combined movements). If we assume that all employees arrive within 10 minutes of each other in separate vehicles, the hourly rate is 15 vph during peak times. Vehicle access to the site is via Main Street off the Castlereagh Highway. There are also 5 heavy vehicles per day currently accessing the site (10 vpd combined movements). In recent years there has been a greater number of coal trucks accessing the site. Under the Project, all coal will be received by overland conveyor. Trucks accessing the site in future will generally be limited to deliveries of stores and equipment. Access to the truck wash and weighbridge will continue on an as needs basis.

No increase in personnel is proposed other than during the construction phase. No coal will be dispatched from the site via the public road network.

A summary of the existing traffic volumes is shown in **Table 25**.

Table 25: Summary of Existing Traffic Volumes

Location	Vehicles per day[1]	Vehicles per hour[1]
Castlereagh Highway[2]	4,300	430
Lidsdale Siding	20[4]	20[4]

1) All vehicle rates shown are for combined entry/exit movements;

2) Castlereagh Highway at Centennial Coal Services site;

3) Includes light vehicles and coal dispatch trucks;

4) Includes light and heavy vehicles.

8.4.8.3 Construction Impacts

No increase in personnel is proposed other than during the construction phase. During construction, it is expected that an additional 20 light vpd will access the site (40 vpd combined entry/exit movements) over a 12 month period.

It is also expected 2 heavy vpd (4 vpd combined) will access the site over a 12 month period but will peak at 100 heavy vpd (200 vpd combined) for a 1 month window during installation of concrete linings for the reclaim tunnel. The construction haulage route will be via the Castlereagh Highway into Main Street.

The current Annual Average Daily Traffic (AADT) on the Castlereagh Highway south of the Boulder Road intersection is 4,300 vpd, including 17% heavy vehicles, which is 430 vph. A slight increase in both light and heavy vehicles is expected during the construction phase only.

A summary of the proposed traffic volumes during the construction phase is shown in **Table 26**.

Table 26: Summary of Proposed Traffic Volumes During Construction Phase

Location	Existing/Proposed VPD	Existing/Proposed VPH
Lidsdale Siding	20/60	20/25

A summary of the proposed traffic volumes during the peak construction phase is shown in **Table 27**.

Table 27: Summary of Peak Traffic Volumes During Construction Phase

Location	Existing/Proposed VPD	Existing/Proposed VPH
Lidsdale Siding	20/220	20/70

For the purposes of analysis, it has been assumed there are 2,500vpd, or 250vph (combined for both directions) at the Lidsdale Siding entrance. The construction traffic peak volumes have been analysed using gap acceptance theory.

As shown in **Table 27**, the peak number of construction vehicles will be 70vph. Assuming all constriction vehicles will access the Project Site via a right hand turn from Main Street, the critical acceptance gap (ta, sec) and follow-up headway (tf, sec) will be 5sec and 3sec respectively.

Using *NSW Road Design Guidelines*, the practical absorption capacity of Main Street is in excess of 500vph and the average delay at the Project Site intersection with Main Street will be less than 1.5secs. Therefore, the entrance will continue to operate at a “Class A” Level of Service. As such, no additional traffic safety mitigation measures are recommended.

8.4.8.4 Operation Impacts

Once operational, there will be significantly lower total vehicle numbers accessing the Project Site compared with the current operation. This is largely the result of removing the transport of coal to the site by the public road network. Once operational, all coal will be delivered to the site by overland conveyor and exported from the site via the rail network.

Coal would be transported from the site via the rail network, requiring access 24 hours a day, seven days per week. The average frequency would be five trains per day with a peak of seven trains per day, at a nominal net tonnage of 3,800 per train. Two level rail crossings are located within or immediately adjacent to the Project Site as shown in **Figure 9.**

One level rail crossing is located is located on Main Street immediately adjacent to the Project Site. Vehicle queuing at the Main Street level rail crossing as a result of the Project is predicted to be minimal due to the following reasons:

- the frequency of the proposed incoming/outgoing number of trains (average of 5 per day and maximum 7 per day) is minimal
- queuing along Main Street is controlled by the operational capacity of the Castlereagh Highway/Main Street intersection. Since the existing performance of the Castlereagh Highway/Main Street intersection is considered to be acceptable, the possibility of queuing along Main Street from the Castlereagh Highway/Main Street intersection to block the rail level crossing located 480 metres from the intersection is minimal
- during the peak hour period, a train could block Main Street at the railway crossing only once due to the proposed frequency of incoming/outgoing trains. It is noted that situation currently occurs under existing operations.

The existing road line marking on Main Street does not comply with AS1742.7-2007, Manual of Uniform Traffic Control, Part 7: Railway Crossings and requires upgrading involving road marking which would normally be a requirement of the road managers (Lithgow City Council) in consultation with NSW Roads and Maritime Services (RMS). The Traffic and Rail Impact Assessment states that no train safety mitigation measures are required as a result of assessment of the Project.

A second level rail crossing is located in the northern portion of the Project Site at the intersection of the railway with Duncan Street / Brays Lane. The potential for traffic queues at this crossing is expected to be minimal due to the low level of local vehicle traffic associated with this lane. As such, no additional train safety mitigation measures are recommended by the Traffic and Rail Impact Assessment.

8.4.8.5 Mitigation

The Traffic and Rail Impact Assessment concludes that the impact of the Project on the existing environment is primarily for the construction phase only and can by the preparation and implementation of a construction traffic management plan. The Assessment also recommends the upgrade of road line marking on Main Street to satisfy AS1742.7-2007, Manual of Uniform Traffic Control, Part 7: Railway Crossings.

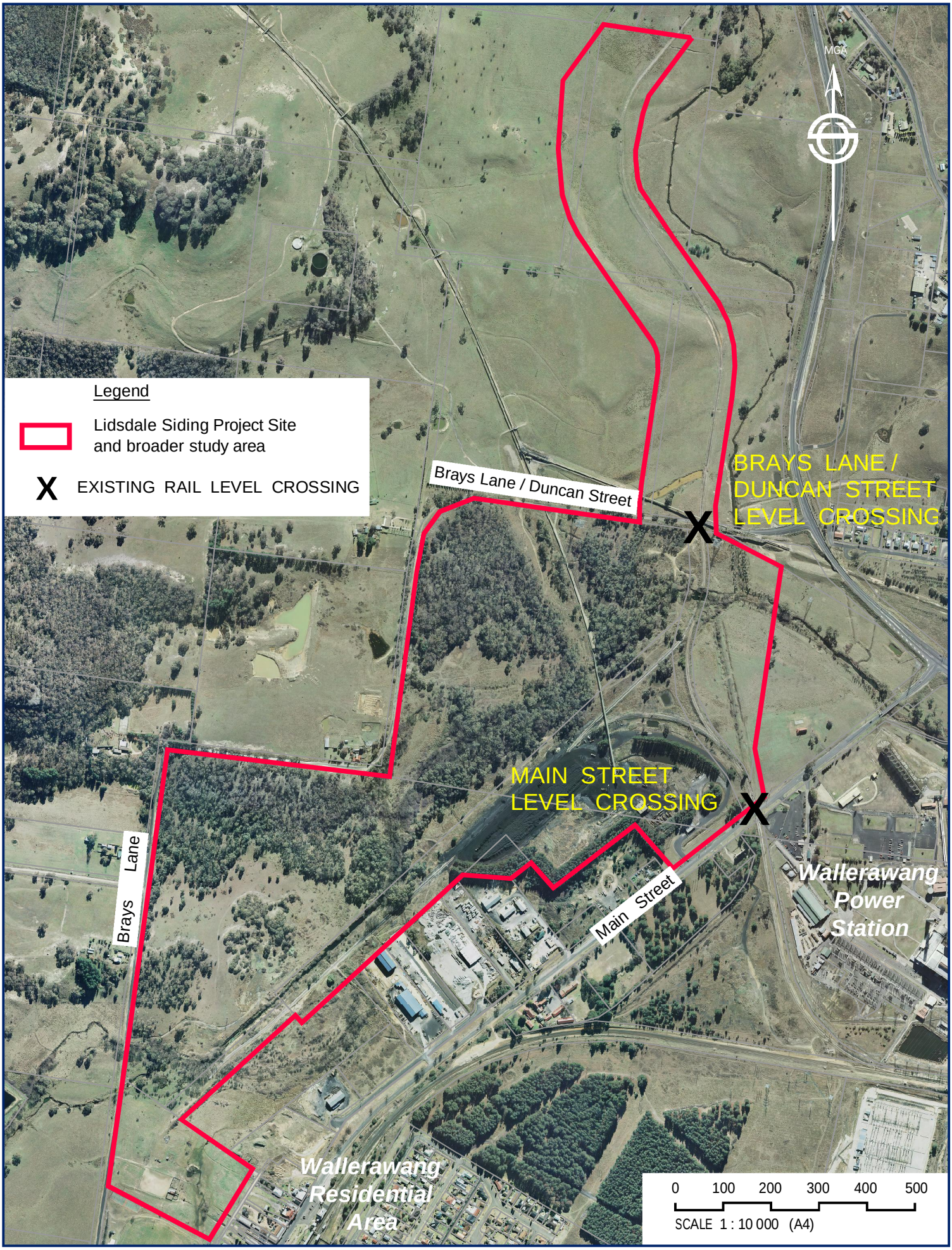

FIGURE 9

TITLE: **Lidsdale Siding Upgrade Project** EXISTING RAIL LEVEL CROSSING LOCATION | LOCATION: WALLERAWANG | DATUM: (GDA 94) PROJECTION: PROJECT AREA | DATE: 22ND AUG 2012 PURPOSE: ENV ASSESSMENT | CAD REF: **110912 Upgrades to Project Ar** VERSION: Rail Crossing Location

CLIENT: CENTENNIAL COAL
JOB REF: 110912

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RPS

8.4.8.6 Residual Impacts

Residual impacts relate to rail capacity and level crossing safety.

There are currently 72 to 82 total rail movements from Lithgow on any day. As trains get closer to Penrith, there are an increased number of services each day, with 184 to 190 movements on a weekend and 252 to 256 movements on a weekday at Penrith.

Centennial currently has a secured 6 train paths per day between Lithgow and ports on the NSW coast and would require approximately 3 additional train paths per day to cater for the increased tonnage from the Project Site. Additional train paths need to avoid peak hour commuter trains (referred to as white out periods) which are generally 6am to 9am and 5pm to 7pm weekdays. Centennial is currently in the process of securing the additional train paths which would see a nominal increase in total daily train movements of less than 2% at Penrith. This residual impact is not considered significant.

New South Wales rail agencies and roads authorities are responsible for level crossing safety. Regulatory oversight is provided by the NSW Independent Transport Safety Regulator (ITSR) for rail operations/infrastructure and the road/rail interface, and by the RMS, Local Government and NSW Police Force for roads. Coordination of level crossing activities in NSW is provided through the Level Crossing Strategy Council. This is an interagency forum to promote coordination between agencies to improve level crossing safety. The Council coordinates the development and oversees implementation of the Level Crossing Improvement Program (LCIP).

The LCIP provides funding to accelerate improvements to level crossings at priority sites across NSW as agreed by all road and rail agency stakeholders and for other level crossing safety initiatives. It is additional to the funds road and rail agencies spend on upgrading level crossings on their networks.

The methodology to determine the level crossings to be included for LCIP funding was developed by the Level Crossing Working Group and approved by the Level Crossing Strategy Council. In the first instance the methodology considers historical crash risk for each of the level crossing control types (active controls – lights and bells, and lights, bells and boom gates; and passive controls - stop signs and give way signs).

The Australian Level Crossing Assessment Model (ALCAM) is then used to assess and rank the comparative risks of crossings within the control type groups to assist identify the priority crossings for inclusion in the LCIP. ALCAM is a scoring algorithm which considers each level crossings physical properties (characteristics and controls) including consideration of the related common human behaviours, to provide each level crossing with a "Likelihood Factor" score. This score is then multiplied by the level crossings "Exposure" score (a factor taking into account the volumes of Vehicles / Pedestrians & Trains) & finally multiplied by the Consequence score to give the ALCAM Risk Score. The ALCAM Risk Score, enables the comparison of the relative scores across level crossings within a given jurisdiction. This provides an overall risk rating for the level crossing however each individual hazard needs to be considered in its own right.

An ALCAM assessment has not been undertaken for the Main Street or Brays Lane crossings but could be considered in future if there is uncertainty regarding the level of controls provided at each intersection. Relevant to the two crossings are the low speed of trains (generally walking pace) and the low speed of traffic (50 km/hr), good sight distances on approach to the crossing and low road traffic volumes. Centennial will participate in this process if considered appropriate by the Level Crossing Strategic Council.

8.4.9 Social

8.4.9.1 Introduction

Lantz Marshall was engaged by Centennial to prepare a Social Impact Assessment for the Project. A copy of the report is contained in **Appendix 9**, and significant findings and recommendations from the Assessment are summarised below.

The Assessment takes into account how the development would impact on the needs, issues, values and aspirations of the surrounding community and stakeholders. The approach for this Social Impact Assessment followed the industry standard and involved the following stages:

(1) Profiling: This involves understanding the scale and scope of the project, parameters of the Social Impact Assessment, and identifying the stakeholders (determined by the areas of affectation).

(2) Scoping: This involves identifying the likely impacts arising from the development and includes consultation and feedback from identified stakeholders. Consultation is undertaken in a range of ways and may include informal consultation, stakeholder engagement, surveys etc.

(3) Assessment: This section explores the likely impacts that would arise. The scope of the assessment is determined by the likely impacts and as a guide may include (but not be limited to):

- economic profile of the area and economic impact (contribution or otherwise) arising from the proposal
- changes to the population and characteristics of the area
- the community structure, its character or beliefs
- the health and safety of those living and working in the vicinity of the development
- an assessment of safety as it relates to crime, anti social and nuisance behaviour
- social cohesion, in particular the quality of life of those living in the vicinity of the development
- cost of living, including housing affordability
- accessibility
- sense of place and community
- the impact on existing services, including tourism etc.

(4) Management: All impacts should be identified and those that are identified as having an adverse or detrimental affect need to be managed and mitigated where possible. It is not always possible to manage all adverse impacts however identification of these impacts and how they can be managed must be taken into account. Similarly, impacts that are identified as being positive need to also be identified and capitalised upon where possible and appropriate. This allows for an assessment as to whether the proposal meets net community benefit criteria.

(5) Monitoring: Strategies to monitor identified impacts may need to be identified to ensure that management strategies are adhered to and those cumulative impacts are identified, monitored and taken into account with further development.

8.4.9.2 Existing Situation

The broader sub-region, including the townships of Wallerawang and Lidsdale, is bounded by the locality of Blackmans Flat, Coxs River and the locality of Wolgan Valley in the north, the Wolgan River and the localities of Springvale and Marrangaroo in the east, Coxs River, the locality of Rydal, Solitary Creek and the locality of Mount Lambie in the south, and Thompsons Creek Road, Pipers Flat Road and the locality of Portland in the northwest.

Wallerawang is named from an Aboriginal word thought to mean "water on rocks" or "plenty of water". Settlement of the area dates from the 1820s, with land used mainly for farming. Population was minimal until the 1860s, with growth during the late 1800s, aided by the opening of the railway line in 1871. Significant development did not occur until the late 1950s, spurred by the opening of a power station in 1957. The population declined slightly from the mid 1990s, a result of few new dwellings being added to the area, and a decline in the average number of persons living in each dwelling.

Primary access to Wallerawang is along Main Street via the Castlereagh Highway. Wallerawang Power Station sits at this intersection as does Lidsdale Siding. The Wallerawang CBD is located on Main Street, approximately 1.5 kilometres from the Castlereagh Highway intersection. The CBD is well defined and contains a range of retail and commercial outlets to support day to day needs of residents with higher order commercial and retail needs being met in the Lithgow urban area.

Residential housing is located to the south and south west of the CBD. Closer to the CBD is older housing of fibro, timber and brick veneer construction. Towards Lake Wallace is newer residential housing and further along the Wallerawang Rydal Road is large lot rural residential.

Lidsdale sits to the east of the Castlereagh Highway intersection and residential housing is located primarily along the Wolgan Road.

Major features of the area include Lake Wallace, Wallerawang Power Station, Wallerawang Oval, several state forests and one school. Key services for the area include:

- community facilities: Council library and depot; medical and community health centres; recreational facilities including PJ Hall Memorial Park, Lake Wallace, playing fields and skate park; police, fire services; Country Women's Association; churches; primary school; bowling club
- retail and commercial facilities /services: supermarket; post office (with a pharmacy prescription service (drop in (am) and pick up (pm)); bank; newsagent; bakery; butcher; service stations; hotels; takeaway store; hairdresser
- Lidsdale facilities: Rural Fire Service; tennis courts; Ted Hughes Memorial Park; church.

Based in the findings of the various consultants' reports the Assessment identified:

- The Project will have an overall positive economic contribution at a regional level and also to the local community.
- Noise levels are likely to be less than those which currently occur from the site and the Project is therefore considered to be acceptable.
- The Project is not expected to have a significant impact on the ecology of the study area, including threatened flora, threatened fauna or endangered ecological communities that are known or expected to occur therein.
- The Project operations are likely to provide a measurable improvement in air quality in the local area and will unlikely contribute to any exceedances of the respective NSW OEH criteria for the pollutants assessed.

It is considered that the visual components of the Project maybe the most obvious to the community. It is noted that the expected visual impacts, as identified within the Visual Assessment, will be moderate. It is also noted that mitigation strategies are suggested in order to reduce such impacts.

Review of the environmental assessment specialist reports has revealed that there is no adverse social impact identified to prevent the Project from being undertaken.

8.4.9.3 Construction Impact Assessment

The impacts of construction associated with the Project, such as noise, dust, and traffic impacts, are not expected to be significant, due to the majority of work being well shielded from surrounds. The construction noise criteria will not be exceeded and changes to traffic during construction are unlikely to be significant.

The Project is more likely to have a positive social impact due to the increase in employee numbers during construction.

8.4.9.4 Operation Impact Assessment

The operation of mining related industries is often a contentious issue regardless of whether or not they have been operating for a period of time.

In the context of Lidsdale Siding, it has been found that the general community in the area of this project have a general acceptance for mining, power generation and associated industry. The main potential impact is the identified visual impact. This is brought about by the extension of the rail line and rail bin. Effective screening has been incorporated into the Project.

It appears that residents would talk freely about the importance of mining and can clearly articulate the positive impact in relation to jobs, multiplier effects and that the construction of additional infrastructure represents progress.

However, the association with mining does not mean that residents, and business owners, would tolerate a negative impact on their quality of life and amenity of the area generally.

The impact of industry in Wallerawang and Lidsdale has not been without any adverse effects – residents are concerned about noise, dust, smell and visual impacts which collectively relate to amenity. It was not uncommon for residents to express concern for other residents who they know are impacted upon by the surrounding industry. This seems to have been recognised / acknowledged only by a few companies which includes Centennial who seem to have a good rapport with neighbours and have taken steps to address issues arising from their current operations.

Wallerawang and Lidsdale have other values of significance given their location; being on a main traffic through fare to/from Mudgee; access point to significant natural features / landscapes such as the Wolgan Valley and other tourist destinations etc. With this in mind, it is important to note the social impact is not necessarily restricted to those residents within the immediate vicinity. The primary area of affectation may also include those other ‘users’ who have a strong connection with the area.

8.4.9.5 Mitigation

In addition to the mitigation measures implemented for traffic, noise and air quality impacts identified within this EA, the expected visual impacts of the Project will be moderate. This means that mitigation strategies are warranted in order to reduce the visual impacts of the Project which can be achieved by vegetation screens.

8.4.9.6 Residual Impacts

No significant ongoing residual social impact has been identified to prevent the Project from being undertaken.

8.4.10 Economics

8.4.10.1 Introduction

Aigis Group was engaged by Centennial to prepare an Economic Assessment for the Project. A copy of the report is contained in **Appendix 10**. The Assessment identifies the direct and indirect economic costs and benefits of the Project and also estimates the extended regional economic benefits and costs. Significant findings and recommendations from the Assessment are summarised below.

8.4.10.2 Existing Situation

Springvale Mine and Angus Place Colliery currently supply both Wallerawang and Mount Piper Power stations, with limited export potential via the existing Lidsdale Siding. Angus Place Colliery currently has no ability to access export markets while Springvale Mine has the ability to export a component of its coal using the underside of the overland conveyor from the Centennial Coal Western Coal Services Site to the Project Site. There are also several mining opportunities in the local area, which could generate up to one million tonnes per annum (Mtpa) of run-of-mine (ROM) coal which at present could not access the Project Site or Centennial Coal Services Site without using the public road network.

8.4.10.3 Construction Benefits

An estimate of the extended economic impacts associated with the construction works of the Project has been derived from the use of the input-output (I/O) multipliers methodology. Output and employment multipliers for mining and related services and multipliers for construction were identified and used in the assessment. The results indicate an economic benefit of $121 Million (M) during the construction phase of the Project and an incremental impact of $1,668 M.

8.4.10.4 Operation Benefits

The Assessment indicates that the Project may stimulate an additional $1.4 Billion in economic activity and 2,637 full time equivalent (FTE) jobs in the regional economy over the assumed 15 year project forecast. This is a result of the direct economic stimulus of the construction works associated with the Project, coupled with greater output and more efficient operation of the siding. In the operating phase, the Project may support $6.3 billion in economic activity in the regional economy over the 15-year period observed.

In addition to these direct economic benefits to the regional and state economy, there are broader benefits to the State in the form of royalty revenues associated with the increase in export production that the Project would facilitate. The Project will result in increases in royalty revenue for NSW of approximately $54 million, over the forecast period based on presently held price assumptions.

8.4.10.5 Mitigation

Mitigation measures are not necessary with regard to the economic component of the Project.

8.4.10.6 Residual Impacts

A number of economic costs may occur as a result of the Project. These are associated with any residual environmental, social or cultural impacts after implementation of mitigation measures. There will be ten direct contractor positions made redundant at Lidsdale Siding, however the Project's improved, continued operations will support 285 positions at Springvale Mine. There is also potential for some redeployment of the contractors on other Centennial operations.

8.4.11 Soils, Land Resources and Agriculture

8.4.11.1 Introduction

GSS Environmental (GSSE) were engaged by Centennial to prepare a Soils, Land Resources and Agricultural Assessment for the Project. A copy of the Soils, Land Resources and Agricultural Impact Assessment is contained within **Appendix 11** and significant findings and recommendations from the Assessment are summarised below.

8.4.11.2 Existing Situation

Soils - The facility lies on the central western edge of the Sydney Basin within the Illawarra Coal Measures and the siltstone dominated Berry Formation, which overlies the Megalong Conglomerate to form the Shoalhaven Group (King, 1992).

Areas within the Illawarra Coal Measures consist of shale and sandstone in addition to conglomerate, limestone, dolomite, claystone, mudstone, coal and torbanite. Areas within the Berry Formation consist of grey siltstone with thin beds of limestone and sandstone.

Unconsolidated alluvium overlying the Illawarra Coal Measures in the drainage areas and their associated floodplains consist of shale, sandstone, conglomerate, limestone, dolomite, claystone, mudstone, coal and torbanite. The cliffs and rises of the upper landscape are composed of Narrabeen Group sandstones, which consist of quartz-lithic sandstones and quartz sandstones, inter-bedded with thin red, grey and green claystone shale and occasional conglomerate and ironstone lenses.

Land - The Wallerawang 1:100,000 Sheet Rural Land Capability Classification (Department of Natural Resources, 2005) maps the Project Site and broader study area as Class U which is land disturbed by urban development, in this case mining related infrastructure.

The agricultural suitability classification of the Project Site and broader study area is Class 5. This class of land is marginal land not suitable for cultivation and has very low potential for grazing production.

Agriculture - The Project Site and broader study area is characterised by mining related infrastructure and disturbed areas. The land capability classification of the area is Class U land. Agricultural suitability classification is Class 5 land, i.e. not suitable for cultivation or grazing.

There is no agricultural production land within the Project Site and broader study area and no Strategic Land in accordance with the NSW Strategic Land Use Policy.

8.4.11.3 Construction Impact Assessment

One of the primary design aspects of the Project is the prevention of clean water in ephemeral drainage channels entering the active disturbance area. This will be achieved through the use of cut-off drains, sediment traps and diversions, as well as the containment of dirty water via temporary sediment controls eg. sediment filter fencing, sand bags, straw bale filters, etc. within the active areas of the Project Site to limit any uncontrolled runoff.

8.4.11.4 Operation Impact Assessment

As the Project Site and broader study area is characterised by mining related infrastructure and disturbed areas, it is considered that there will be minimal impact to soils, land resources and agriculture as a result of the operation of the proposed upgrade.

The potential operational impacts that may occur relate to soil erosion. Effective erosion and sediment control for the Project Site will require appropriate activities to be carried out over the life of the Project. The effectiveness of erosion and sediment controls during the operational and closure stages will be optimised through effective construction planning and design.

8.4.11.5 Mitigation

In order to mitigate impacts on soils, land resources and agriculture the following mitigation measures have been indentified:

- preparation and implementation of a detailed Erosion and Sediment Control Plan (ESCP) as part of the Construction Environmental Management Plan, prior to commencement of construction.
- cut-off drains, sediment traps and diversions will be established as per Managing Urban Stormwater: Soils and Construction (Landcom) to prevent clean water diversion into ephemeral drainage channels entering the active disturbance area
- containment of dirty water via temporary sediment controls eg. sediment filter fencing, sand bags, straw bale filters, etc. within the active areas of the Project to limit any uncontrolled runoff.
- sediment traps will be provided to intercept as much runoff from the Project Site. Sediment controls will be responsible for managing runoff from the site over the life of the Project. The proposed sediment control locations will be selected so that runoff from disturbed areas will be intercepted and appropriately managed before release into the creek system.

8.4.11.6 Residual Impacts

There are no residual consequences provided that the mitigation measures identified above are implemented.

8.4.12 Terrestrial Ecology

8.4.12.1 Introduction

RPS was engaged by Centennial to prepare an Ecological Assessment for the Project. A copy of the report is contained in **Appendix 12** and significant findings and recommendations from the Assessment are summarised below.

The Assessment examines the likelihood of the proposal to have a significant effect on any threatened species, populations or ecological communities listed under the Threatened Species Conservation Act 1995 (TSC Act). The Assessment recognises the relevant requirements of the EP&A Act. 1979 and has regard to those threatened entities listed federally under the EPBC Act.

The Project Site and broader study area lies within a disturbed site consisting of existing coal handling infrastructure, cleared land and some forested land.

8.4.12.2 Existing Situation

Information for preparation of the Assessment was gathered through literature review and site surveys which were undertaken between 2010 and 2012. The key findings within the broader study area consisted of one threatened flora species, one threatened bat species, one threatened bird species and one Endangered Ecological Community (EEC), details of which are identified within **Table 28**.

Table 28: Threatened Species Found in the Broader Study Area

Scientific Name	Common Name	TSC Act Status	EPBC Act Status	NPWS Atlas records
Threatened Flora				
Eucalyptus aggregata	Black Gum	V	-	14
Threatened Fauna				
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	39
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V	-	9
Endangered Ecological Community (EEC)				
T*ablelands Hollows Black Gum – Black Sally Open Forrest (degraded)*				

Notes: (PD) = Preliminary determination
(V) = Vulnerable Species listing
(E) = Endangered Species listing
(CE) = Critically Endangered Species listing

In addition to the above, it has been established that the habitat is considered suitable for a number of other threatened fauna, which may use the site on at least an intermittent basis.

In preparing the Assessment, a literature review was undertaken to assist in identifying distributions, suitable habitats and known records of threatened species so that field investigations could more efficiently focus survey effort.

The location and extent of the vegetation communities identified within the Project Site and the broader study area is shown in **Figure 10**. The broader study area is dominated by cleared land while the Project Site is dominated by existing coal handling infrastructure, cleared land and exotic species.

Habitats within the Project Site and broader study area were assessed for their potential to support native flora and fauna species including threatened fauna for which records occur within the wider locality. Broad habitat types recorded included; open forest areas, riparian/damp areas and cleared lands.

- *Terrestrial Habitats* - The Tableland Hollows Black Gum - Black Sally Grassy Open Forest consists of a grassy understorey which provide suitable habitat for a number of terrestrial mammals, including macropods and wombats. The understorey structure in this community is generally lower than in other communities due to the natural absence of a shrub layer. The Red Stringybark- Brittle Gum woodland supports a more complex understorey and would also provide suitable habitat for a range of species. *The Red Stringybark*- Brittle Gum woodland provides suitable habitat for the threatened flora species Capertee Stringybark and Silver-leafed Gum. The Tableland Hollows Black Gum - Black Sally Grassy Open Forest provides the most suitable habitat for the threatened Black Gum and Austral Toadflax. Areas of low-lying cleared land, dominated by Kangaroo Grass are also considered to provide suitable habitat for Austral Toadflax.
- *Arboreal Habitats* - numerous hollows occurred on the site at a moderate density, reflecting the presence of hollow dependent arboreal mammal species. The presence of arboreal mammal populations on the site suggests that there are sufficient foraging opportunities to support forest owls, although a general paucity of large hollows places constraints upon breeding opportunities for these species.

  The cleared areas (mostly dominated by native Themeda australis grasslands) are generally small and do not compromise the connectivity between forest habitats. They may also be preferred for foraging by insectivorous microbats.
- *Corridors and Habitat Linkages* - the site is located to the southeast of a large (~500ha) remnant of native vegetation (state forest) with some corridor connectivity occurring. In the broader regional context several large blocks of native vegetation occur, including Lidsdale State Forest to the south of the study area and Ben Bullen State Forest to the north and west of the study area.

8.4.12.3 Construction Impacts

The only physical component of the Project which may impact on vegetated areas is the construction activities associated with the rail siding and shunt line. The land impacted by this work including the track extension represents cleared agricultural land. Native vegetation will generally not be impacted by the Project however some trimming or minor tree removal may be necessary during construction to allow safe clearance from the rail line. Within the Project Site there is approximately 0.25ha of native vegetation being the Tableland Hollows Black gum – Black Sally Open Forest (degraded) (EEC) and 1.95ha of non-native vegetation (willows) as identified in **Figure 10**. Given that the majority of the local occurrence of this EEC is within the broader study area (approximately 98%) occurs outside of the Project Site, it is considered that the Project is unlikely to have a substantial effect on the extent or composition of this community such that its local occurrence is likely to be placed at risk of extinction or lead to a substantial reduction in biodiversity.

The Project is unlikely to reduce viability of any threatened species, population or ecological community, given the low level of impact and the extensive expanse of similar habitat in the broader locality.

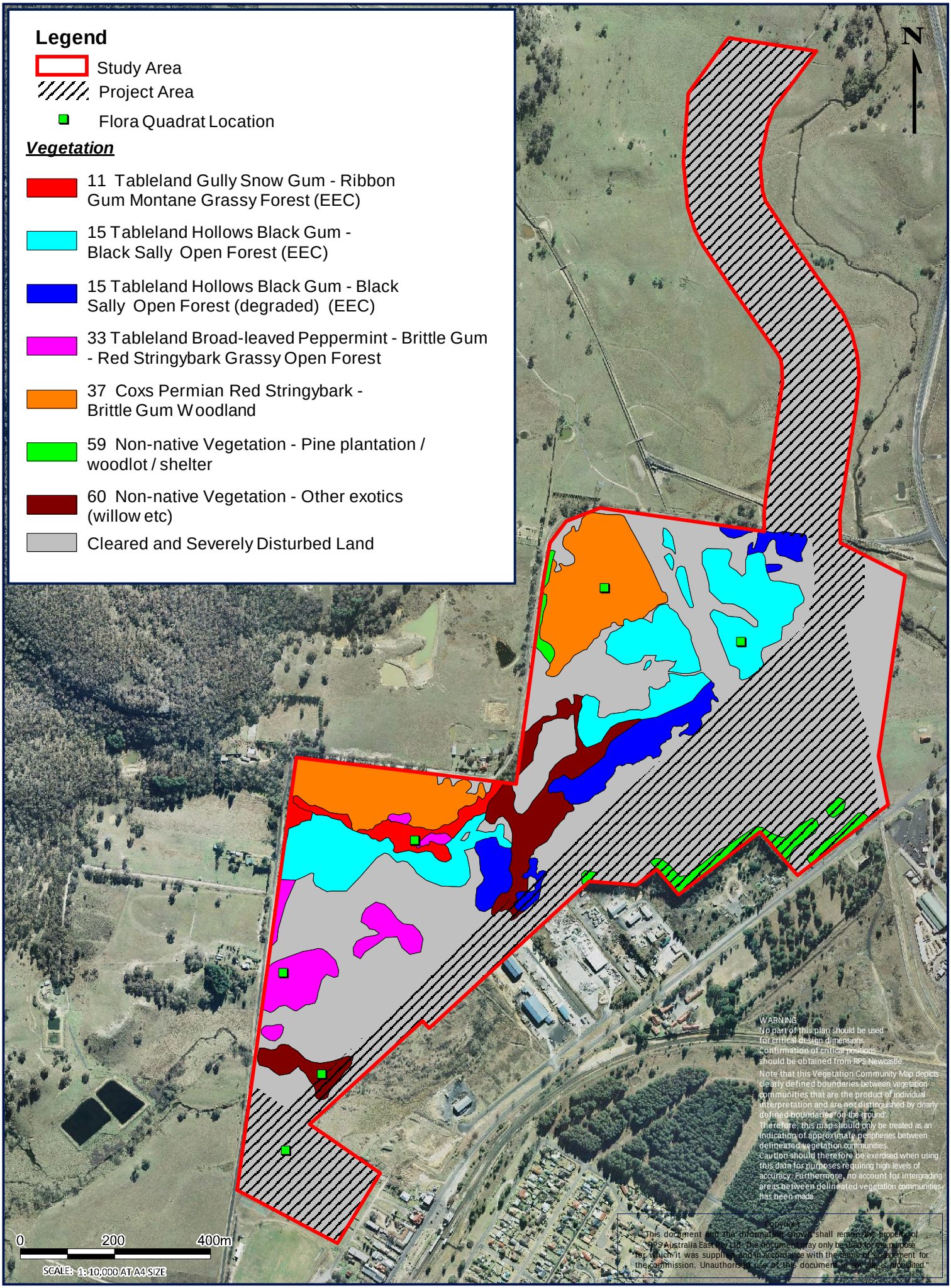
The removal of the relatively small area of habitat for the Project is considered unlikely to accelerate the extinction or place at risk of extinction any species, population or ecological community, given the extensive expanse of similar habitat in the broader locality.

Thirty-seven individual Black Gum trees occur within the Project Site and therefore have the potential to be removed. This species is strongly associated with the Tableland Hollows Black Gum - Black Sally Open Forest community of which approximately 10.3ha occurs within the broader study area in good condition and approximately 3.9ha occurs in a degraded state. No hollow bearing trees are to be removed as a result of the Project.

Two of the 37 Black Gum trees have been recorded within an area mapped as degraded Tableland Hollows Black Gum - Black Sally Open Forest, of which approximately 0.25ha occurs within the Project Site and may potentially be removed. The remaining 35 Black Gum trees were recorded on cleared land alongside the rail line. These individuals include young regrowth specimens growing on top of an existing dam wall. Given that the majority of occupied habitat (approximately 98%) occurs outside of the Project Site, it is considered that the Project is unlikely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

A total of 15 migratory species listed under the EPBC Act 1999 have been recorded or have suitable habitat within a 10km radius of the Project Site, all of which are identified within the Assessment. The Project is unlikely to substantially modify, destroy or isolate an area of important habitat, result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat or seriously disrupt the lifecycle of an ecologically significant proportion of the population of a migratory species.

There are no aquatic Groundwater dependent Ecosystems (GDEs) in the lower Pipers Flat Creek or Coxs River within the vicinity of the Project Site or the broader study area. It is note d that the Project Site is not in a world heritage area; is not a national heritage place; contains no Ramsar wetlands of international importance nor a Commonwealth marine environment.



WARNING
No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle.

Note that this Vegetation Community Map depicts clearly defined boundaries between vegetation communities that are the product of individual interpretation and are not distinguished by clearly defined boundaries on the ground. Therefore, this map should only be treated as an indication of approximate peripheries between delineated vegetation communities. Caution should therefore be exercised when using this data for purposes requiring high levels of accuracy. Furthermore, no account for intergrading areas between delineated vegetation communities has been made.

TITLE: FIGURE 10: VEGETATION COMMUNITIES PLAN
LOCATION: LIDSDALE SIDING
DATUM: (GDA 94)
PROJECTION: MGA ZONE 56
DATE: 14/08/2012
PURPOSE: REPORT FIGURE
LAYOUT REF: 105704 Neubecks - Blackmans Flat\10- Drafting\Lidsdale Sidings\Planning
VERSION (PLAN BY):A A4 (PH-NW)

CLIENT: CENTENNIAL COAL
JOB REF: 110912

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8.4.12.4 Operation Impacts

The Lidsdale Siding operation upon completion of the Project is unlikely to have a significant impact on the existing ecological value of the site and surrounds. The Project also includes progressive removal of invasive Willow species and other noxious weeds which will assist in maintaining the ecological value of the surrounding area.

8.4.12.5 Mitigation

After due consideration against the relevant key thresholds assessment criteria as set out within Draft Guidelines for Threatened Species Assessment for Part 3A Applications (DEC / DPI 2005), the Project is not expected to have a significant impact on the ecology of the broader study area, including threatened flora, threatened fauna or endangered ecological communities that are known or expected to occur therein. The low potential for impact is due to the habitats of the Project area being heavily disturbed, providing limited opportunities for those threatened species considered to have potential to occur within the broader study area.

The following mitigation measures are identified to minimise potential impacts of the Project:

- the minimum amount of clearing will take place as a general objective of the Project, particularly within those areas that contain E. aggregata
- appropriate measures utilising Managing Urban Stormwater: Soils and Construction (Landcom) will be implemented, via a Construction Environmental Management Plan, to minimise erosion and sedimentation impacts upon waterways and associated vegetation resulting during construction
- All construction machinery will be cleaned prior to entering the site so that machinery working within the site does not bring materials (soils etc.) onto the sites that may infect onsite vegetation with Phytophthora cinnamomi or exotic species
- weed monitoring will be undertaken and potential weed infestations will be appropriately managed to ensure surrounding communities are protected from invasive species.

8.4.12.6 Residual Impacts

Native vegetation screens will be planted on the southern and western end of the existing and proposed rail siding. Species selection will be compatible to the vegetation communities located to the north of the Project Site within the broader study area. This will minimise the residual ecological impact resulting from the potential removal of up to approximately 0.25 ha of native vegetation and 1.95ha of non-native vegetation. As the residual ecological impact will be minimal, no offsetting is required.

8.4.13 Aquatic Ecology

8.4.13.1 Introduction

Marine Pollution Research Pty Ltd was engaged by Centennial to prepare an Aquatic Ecology Assessment for the Project. A copy of the report is contained within **Appendix 13** and significant findings and recommendations from the Assessment are summarised below.

8.4.13.2 Existing Situation

The Project Site is located on the southern banks of Pipers Flat Creek just above the confluence with Coxs River at the township of Wallerawang. Pipers Flat Creek drains a catchment that is situated along the eastern edge of the Great Dividing Range to Coxs River some 19km downstream.

The relevant hydrology in the vicinity of the Project Site and broader study area is as follows:

- the upper catchment drains to the north-east into Pipers Flat Creek Dam, 8km downstream. The whole upper catchment has been cleared, predominantly for grazing
- Pipers Flat Dam and lands immediately upstream and downstream are on land leased and / or owned by Centennial, and upstream includes land over the old Ivanhoe No1 Mine (closed in early 1950's), which Centennial Coal is currently rehabilitating. The dam holds about 550 ML and there is currently unused license to supply a mining project at a maximum of 145 ML per year
- Pipers Flat Creek dam discharge flows south east for 7 km towards Wallerawang township. The northern side of the catchment is bounded by Mount Piper (Ben Bullen State Forest), and there are a number of large sub-catchment draining to Pipers Flat Creek from the south; the largest being Thomsons Creek, which contains a water supply reservoir in the upper sub-catchment. The floodplain of Pipers Flat Creek is totally cleared, predominantly for grazing
- the lower section of Pipers Flat Creek is some 2.5km long. The Wallerawang sewage treatment plant (STP) discharges to the creek from the north and the township of Wallerawang west of James Parade drains to the creek. This includes the industrial area and the Lidsdale Coal loader north of Main Street
- Pipers Flat Creek below Brays Lane crossing has been diverted into a 1 km long straight channel alongside the existing Lidsdale Siding .The old creek line has been blocked off at its upstream end but remains connected at the downstream end, as it captures additional drainage from the western portion of Wallerawang township (flowing north-east from the town sports field)
- the last section of the creek is about 1.5km long. It has good riparian cover through to the rail crossing that includes a mix of native and introduced species, mainly willows. The willows have obstructed much of the channel at many locations. There is a small creek discharging into Pipers Flat Creek from a sub-catchment to the north of the Lidsdale Siding property. This sub-catchment has several in-line dams. The Lidsdale Siding Licensed Discharge Point (LDP) under EPL 5129 is located inside the triangle of the rail siding entry and exit lines and discharges via a culvert to the east then flows to a pool located under the northern rail loop. This pool then discharges to Coxs River, which then discharges to Lake Wallace a further 1.5km downstream.

Seasonal Aquatic Ecology Samples were undertaken at Pipers Flat Creek and Coxs River, locations as identified in **Table 29**.

Table 29: Seasonal Aquatic Ecology Sample Schedule and Site Descriptions

Creek/River	Site (Abbrv)	E	N	Description
Pipers Flat Creek	PFup	227738	6300763	Pipers Flat Ck site located around 650m upstream from the confluence with Coxs River.
	PFdn	228119	6300988	Pipers Flat Ck monitoring site around 90m upstream of the Coxs R confluence, where LDP4 discharges into Pipers Flat Creek.
Coxs River	CR4	228348	6302775	Coxs River site located upstream of Pipers Flat Creek confluence at Maddox Lane.
	CR5	228529	6300752	Coxs River site located downstream of Pipers Flat Creek confluence at Main St bridge, Wallerawang.
	CR6	228533	6297741	Lower Coxs River monitoring site located below Lake Wallace Dam.

Key findings regarding water quality as a result of surveys by Marine Pollution Research are:

- surface water temperatures ranged between 6.1°C and 11.0°C for the Autumn surveys and 14.7°C and 19.8°C for the Spring surveys
- surface water conductivity in Coxs River sites ranged from 558 µS/cm to 998 µS/cm and for all four surveys CR5 recorded the lowest conductivity readings compared to other Coxs River sites
- for the two 2011 seasonal surveys, water conductivity was around 200µS/cm lower in the Pipers Flat Creek sites compared to the Coxs River sites and site PFdn conductivity was around 50µS/cm higher then PFup readings
- surface water dissolved oxygen (DO) results for the Coxs River sites were mostly in the moderate to high range. Sites CR4 and CR6 recorded similar DO values for all surveys, and for the Autumn 2010 and Spring 2011 surveys CR5 recorded significantly higher DO readings when compared to the other Coxs River sites up and downstream
- DO values were correspondingly low in Pipers Flat Creek for both surveys; around 66% saturation in Autumn 2011 and 44% in Spring 2011
- water pH was alkaline at Coxs River and Pipers Flat Creek with lower values in Pipers Flat Creek (around 7.2 pH units) with Coxs River values between 8.0 and 9.0 pH units
- water turbidity is generally low with ranges in Coxs River from 3.7 to 22 NTU (mean 10.8 NTU) and in Pipers Flat Creek 2 to 11 NTU (mean 6.4 NTU).

8.4.13.3 Construction Impact Assessment

Construction activities associated with the Project that are likely to have the potential for direct impacts on adjacent aquatic habitats are:

- Construction of new reclaimers situated in a reclaim tunnel beneath the stockpile and construction of a spillage reclaim pit beneath the train-loading bin. These works require excavations with potential impacts on shallow groundwater quality and issues relating to overburden storage and surface water and sediment runoff control.
- A track extension to the existing rail siding and a parallel siding adjacent to existing. These works are located alongside Pipers Flat Creek with direct stormwater drainage to the creek and will require careful management of sediment and stormwater control to prevent construction related contaminated waters and sediments from entering the creek.
- The track extension works will also be undertaken over existing minor drainage lines currently transporting stormwater runoff from small urban and industrial sub-catchments to the south-west of the property under the rail line to Pipers Flat Creek, and these works will require suitable bunding to prevent TSS and turbidity entering the creek plus there will need to be suitable bridging to facilitate stormwater flow to Pipers Flat Creek as well as protecting the existing aquatic ecological habitats within these drainage line connections.

Other items required for the Project are generally located within the existing facility and provided normal best-practice water and sediment runoff controls are implemented there are no significant potential impacts.

8.4.13.4 Operation Impact Assessment

The Project involves removal of coal spillage from the northern side of the rail line and to maintain this area clean. This will be possible by the installation of the automated loading system utilising a rail loading bin equipped with a concrete lined coal spill pit. The rail line can then be drained back into the existing pollution control structures on site eliminating the potential for untreated runoff from the northern side of the rail siding to Pipers Flat Creek.

The Project also includes improving the clean water diversions around the site and collection and treatment of all site waters within the site. The operation of the facility as per the Project description will therefore have a positive impact on aquatic ecology.

8.4.13.5 Mitigation

Impacts on aquatic ecology during construction and operation of the Project would be minimised through managing impacts to surface water quality and flows.

Measures that will be implemented to manage impacts to aquatic ecology during construction and operation of the Project include:

- A detailed erosion and sediment control plan will be prepared as part of the Construction Environmental Management Plan (CEMP) prior to construction commencing. The plan will be compliant with all applicable development consent conditions, EA commitments and Environmental Protection Licence requirements
- Contaminated water is to be contained within the site boundary through stormwater catch drains and moved towards the containment ponds utilising methods as per Managing Urban Stormwater: soils and construction (Landcom, 2004) during construction
- If during the construction phase significant surface water is encountered (i.e. following a sustained rainfall event). Surface water sampling and analysis (pH, EC and TSS) may be required prior to reuse
- Erosion and sediment controls will be implemented as per Managing Urban Stormwater: soils and construction (Landcom, 2004) during construction
- Progressive removal of willow trees within the section of Pipers Flat Creek which passes through the site. This work will be undertaken over a 5 year period following completion of the construction phase

8.4.13.6 Residual Impacts

There are no residual consequences provided the mitigation measures identified above are implemented.

8.4.14 Heritage

8.4.14.1 Introduction

RPS was engaged by Centennial to prepare a Cultural Heritage Assessment for the project. A copy of the Assessment is contained in **Appendix 14** and significant findings and recommendations from the Assessment are summarised below.

8.4.14.2 Existing Situation

Non-Indigenous heritage

Preparation of the Assessment consisted of a desktop investigation which included searches of the NSW Heritage Places Inventory and the *Lithgow Local Environmental Plan 1994*. A search for historically significant items under National, State and local levels did not yield any results within the Project Site or the broader study area.

Additionally, RPS sourced documents from the Mitchell Library in Sydney, the State Archive office in Kingswood as well as two photo collections in the Lithgow Learning Centre – the Lithgow District Historical Society Photographic Collection and Lithgow Photographic Collection in order to gain a historical overview of the Wallerawang and Lithgow region.

A pedestrian survey of the Project Site was undertaken by an RPS archaeologist on 21st January 2012. Investigations did not reveal any heritage items within the Project Site or the broader study area. Searches associated with the investigations reveal a number of listed Heritage items outside the Project Site and broader study area. The nearest item of heritage significance is the St John Evangelist Church located on Main Street and some 600 metres away from the Project Site. A concrete slab and wooden beam culvert was identified on the Project Site. It was assessed according to the benchmarks used by the NSW Heritage Branch and the conclusion reached is the structure does not possess any historical or cultural value for the local area. Consequently the Cultural Heritage Assessment concludes the Project Site is well removed from any non-indigenous heritage items and the Project will have no impact upon heritage items in the vicinity and hence beyond the Project Site.

Indigenous Heritage

A pedestrian survey of the Project Site and broader study area was undertaken by an RPS archaeologist and Aboriginal stakeholders representing the Gundungurra Tribal Council Aboriginal Corporation, Bathurst Local Aboriginal Land Council and North-East Wiradjuri on the 12th January, 2012. A further survey was undertaken by an RPS archaeologist in the 25th January 2012. The broader study area was divided into six survey units as shown in **Figure 11**. Areas of sensitivity are within Survey Unit 1a (SU1a) and Survey Unit 1b (SU1b) described below:

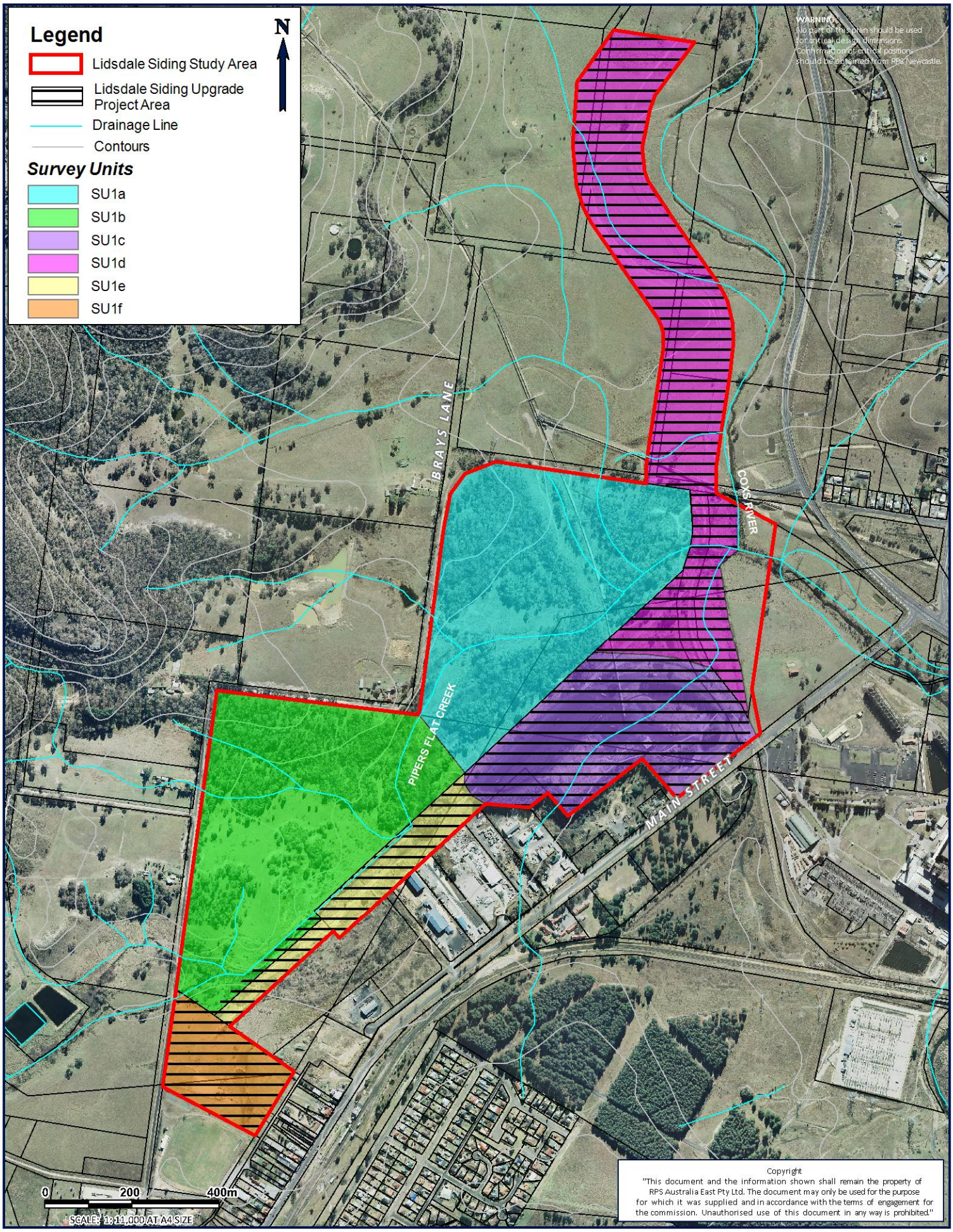
- Survey Unit 1a constituted the northeastern triangular portion of the broader study area and hence outside the Project Site. One artefact scatter and an isolated find were located within Survey Unit 1a. Both sites recorded were located within the clearings of dirt tracks where good ground surface visibility was afforded. No non-Indigenous cultural heritage sites were seen.
- Survey Unit 1b occupied the southwestern triangular portion of the broader study area and hence outside the Project Site. The light vehicle tracks in the Survey Unit afforded excellent ground surface visibility for artefact inspection, where a total of four sites were located outside the Project Site, but within the broader study area, in close proximity to the dirt tracks.

Table 30: Aboriginal Sites

No.	Code	Name	Eastings	Northings	Type
		SU1a			
1	SU1a-A5	Survey Unit 1a-A5	E227585	N6300837	Artefact Scatter
2	SU1a-A4	Survey Unit 1a-A4	E228046	N6301096	Isolated Find
		SU1b			
1	SU1b-A6	Survey Unit 1b-A6	E227105	N6300095	Isolated Find
2	SU1b-A7	Survey Unit 1b-A7	E227122	N6300093	Artefact Scatter
3	SU1b-A8	Survey Unit 1b- A8	E227130	N6300072	Isolated Find
4	SU1b-A9	Survey Unit 1b-A9	E226981	N6300239	Isolated Find

The sites located in the broader study area (all outside of the Project Site) were all confined to clearings created for access tracks. There was one previously recorded Aboriginal Heritage Information Management System (AHIMS) sites in the Project Site: # 45-7-0237 (Artefact Scatter).

The isolated finds identified in the broader study area were all located in clearings near or on dirt tracks, which suggests that they may not have been found in situ. Furthermore, the close proximity of these isolated finds to areas subjected to occasional flood inundation reduced the integrity of the site. On a regional level, the isolated finds were also assessed to be of low significance because they are a common occurrence on a regional scale.



TITLE: FIGURE 11: SURVEY UNITS

LOCATION: WALLERWANG

DATUM: (GDA 94)
PROJECTION: MGA ZONE 56

DATE: 23/08/2012
PURPOSE: EA

LAYOUT REF: J:\JOBS\Centennial\All Jobs\110912 Lidsdale Siding, Wallerwang\10. Drafting\MapInfo Work...
VERSION (PLAN BY): C A4 (CYL -NW)

CLIENT: CENTENNIAL COAL
JOB REF: 110912

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Although SU1b - A7 is an artefact scatter, it is very low density, consisting of only four artefacts in the entire assemblage. The types of artefacts in this site are also very common, mostly being secondary reduced flakes with no evidence of retouched edges. The location of this site is adjacent to a graded dirt track, so the artefacts may have been disturbed in the past and are therefore no longer in context. Based on the localised and low density nature of this site, coupled with its commonality throughout the regional landscape, SU1b - A7 was assessed to be of low significance.

Artefact scatter SU1a - A5 has been classed as a moderately significant site on the local scale and of low significance on the regional scale. The location of this site is in close proximity to a fresh water source, the medium size of this scatter coupled with the wide range of artefact types and material types exploited suggest that this site was used as a campsite. Although artefact density levels in the site are moderate (n=19 pieces), the integrity of the site is relatively poor due to its location on a dirt track. Artefact scatters are a frequent occurrence in the region and therefore are not deemed to be rare.

An assessment of cultural significance of an area incorporates a range of values which may vary for different individual Aboriginal groups and may relate to both the natural and cultural characteristics of places or sites. Cultural significance and Aboriginal cultural views can only be determined by the Aboriginal community using their own knowledge of the sites and their own value system. As such cultural significance is a criterion that only Aboriginal people can assess. Responses and comment on the Project and broader study area was discussed with Aboriginal representatives during the pedestrian survey. Their formal comments have been recorded within the Cultural Heritage Assessment. It is noted that at the time of writing of this EA a response had been received from the North East Wiradjuri organisation who indicated that they agreed with the recommendations in the Assessment and made no comments on cultural significance.

8.4.14.3 Construction Impacts

Non-Indigenous Heritage

There are no historical heritage items listed within the Project Site. The construction and operation of the Project will not impact on any of the listed heritage items within the local area that are outside the Project Site.

Indigenous Heritage

There are no Indigenous heritage items located within the Project Site. Construction works associated with the Project would be unlikely to affect identified heritage listed items in the vicinity of the Project Site that is those located within the broader study area.

8.4.14.4 Operation Impacts

Operation of the Project is unlikely to have any impact upon Indigenous or Non-Indigenous Heritage.

8.4.14.5 Mitigation

The following mitigation measures are identified based upon the legislation designed to address the impact of development on sites of cultural significance. Proposed works may proceed with regard to the following:

- The five artefact scatters and isolated finds located within the broader study area (all outside of the Project Site) will be included in the Lidsdale Siding Environmental Management System and protected by the erection of visible protection fencing in consultation with the indigenous communities involved in the Cultural Heritage Assessment and included in any site inductions as necessary. The condition of the visible protection fencing will be monitored and maintained for the duration of works.

- Whilst not anticipated, in the event that any work is to occur where the five identified sites are located in SU1a and SU1b, and there is no possibility of avoiding harm to the sites, a Section 90 Aboriginal Heritage Impact Permit (AHIP) will be sought to salvage the artefacts.
- Should a Section 90 permit be granted, the salvage program is to be undertaken by an experienced heritage consultant with the participation of Aboriginal stakeholder group representatives. The nominated keeping place for the salvaged artefacts is to be nominated by the Aboriginal stakeholder groups, but should be kept at a safe holding place (e.g. Lidsdale Siding) until a permanent storage facility is determined.
- Whilst impact on the five sites identified is not anticipated, a due diligence approach should be adopted to ensure sites would not be inadvertently impacted.

8.4.14.6 Residual Impacts

There are considered to be no residual consequences provided the mitigation measures identified above are implemented.

8.4.15 Hazard and Risk

8.4.15.1 Introduction

SEPP 33 came into force in 1992 with a focus on the identification and assessment of potentially hazardous industry. It applies to any development proposal which falls under the Policy's definition of "potentially hazardous industry" or "potentially offensive industry".

Certain activities may involve handling, storing or processing a range of substances which in the absence of locational, technical or operational controls may create an off-site risk or offence to people, property or the environment. Such activities would be defined as potentially hazardous or potentially offensive.

For development proposals classified as 'potentially hazardous industry' the policy establishes a comprehensive test by way of a preliminary hazard analysis (PHA) to determine the risk to people, property and the environment at the proposed location and in the presence of controls. Should such risk exceed the criteria of acceptability, the development is classified as 'hazardous industry' and may not be permissible, depending on the local zoning.

For developments identified as 'potentially offensive industry', the minimum test for such developments is meeting the requirements for licensing by the OEH. If a development cannot obtain the necessary pollution control licences or other permits, then it may be classified as 'offensive industry', and may not be permissible in most zonings.

In order to determine whether the Lidsdale Siding project is a Potentially Hazardous development, the Risk Screening Method outlined in the Applying SEPP 33 Hazardous and Offensive Development Application Guidelines was applied as outlined in the following sections.

8.4.15.2 Existing Situation

The risk screening is based on the potential for, and consequences of an explosion, fire, or release of toxic substances. It takes the following factors into account:

- the properties of the substances being handled or stored
- the conditions of storage or use
- the quantity involved
- the location with respect to the site boundary

- the surrounding land use.

The Australian Code for the Transportation of Dangerous Goods by Road and Rail (Dangerous Goods Code) provides a full description of the classification of substances as dangerous goods.

Diesel fuel is currently brought onto the site by a dedicated refuelling truck where contained volumes are generally less than 20,000 L. Minor quantities of oils, hydraulic fluid, grease and general workshop solvents and chemicals are stored in the workshop. The quantities are well below the limits required for separate licensing and the site does not hold a Dangerous Goods Licence. No explosives are used or stored on site.

Other risks associated with the existing operation and its upgrade include bushfire, damage to utilities and services, vandalism and illegal access, flooding and spills of dangerous or toxic materials. These issues are discussed further in the following sections.

8.4.15.3 Construction Impacts

During construction the following materials will be brought onto the site and temporarily stored:

- Diesel, stored in a self bunded tank which complies with AS1940-2004 (Storage and handling of flammable and combustible liquids) and AS1692-2006 (Steel tanks for flammable and combustible liquids). Approximately 20,000 L will be stored
- Oxy-Acetylene tanks which are a Class 2 Dangerous Good and which will be used for steel work on site
- minor quantities of cement in bags with the majority being brought onto site in a ready-mixed form
- minor quantities of oils, solvents, hydraulic fluid and cleaning products.

Materials requiring bunding will be stored in accordance with ASAS1940-2004. It is not expected that explosives will be required during the construction program. Materials defined as Hazardous or Dangerous will be stored and handled in accordance with Material Safety Data Sheets (MSDS's). They will be stored in a safe area including, if required, bunding to contain 110% of the volume of the stored material to prevent or contain accidental spillage and harm to the environment. MSDS's will be kept on a register and available at the point of storage.

Dial-before-you-dig investigation will be undertaken along with mapping of all internal services prior to excavation works. This will ensure that damage to internal or external services will be avoided.

8.4.15.4 Operation Impacts

Once operational, the upgraded facility will operate in a similar fashion as presently with the only additional item being the self bunded transportable tank to store approximately 20,000 L of diesel. This tank represents a replacement to the previous above ground tank which was in operation on site for many years.

The risk of flooding is an area of further and separate study. The surface water management plan for the upgrade project identified the removal of the existing Willows within Pipers Flat Creek as a means of reducing flood impacts, at least for low to moderate flood events. Other measures will be investigated in future to reduce the higher floods from impacting the operation. Public safety will be improved with the construction of a man-proof fence around the facility.

Although bushfire risk has been identified for the site, it is considered a low risk due to the existing separation between vegetated areas to the north of the site. There is also adequate separation between the facility and other industrial uses along Main Street. No additional mitigation strategies are considered warranted.

There are no additional ongoing operational hazard or risk implications for the project. Based on the risk screening method of Department of Urban Affairs and Planning (DUAP:1997), neither the storage nor transport of hazardous materials associated with the Lidsdale Siding Upgrade will result in the project being considered potentially hazardous under SEPP 33. As such, there is no requirement to undertake a Preliminary Hazard Analysis.

8.4.15.5 Mitigation

A Construction Environmental Management Plan will be prepared prior to construction commencing. This document will include procedures for containing and managing Dangerous Goods on site and will include any specific requirements of MSDS's for the materials involved.

8.4.15.6 Residual Impacts

It is not anticipated that there will be any residual impacts or risks associated with the construction and ongoing operation of the project above what already exists.

8.4.16 Waste

8.4.16.1 Introduction

Lidsdale Siding does not process coal or otherwise generate or dispose of coal waste. Waste generation is typical of a small workshop and office consisting of used oils, empty drums, packaging, scrap metal and office wastes.

Lidsdale Siding operates in accordance with a Waste Management Plan which provides for the correct handling, disposal and minimising of waste generation.

8.4.16.2 Existing Situation

Waste Oil

Waste oil is comprised principally of engine and gearbox oil drained from machinery during maintenance and any oil remaining in used oil drums. All waste oil is stored in a1000L waste oil tank, which is collected on an "as required" basis by a licensed waste oil contractor.

Used Oil Drums

Standard 20 and 200 litre drums are used to supply hydraulic, engine and gearbox oil to machinery. The used drums are crushed and placed with other scrap metal in the scrap metal bin located outside the workshop.

Use of 20 and 200 litre drums is being phased out with the introduction of 1000 litre bulky bins, which are sent back to the oil supplier for re-filling.

Scrap Metal

Scrap metal generated at Lidsdale Siding mainly includes off-cuts from fabrication, and used oil drums. The scrap metal is collected in the scrap metal bin located outside the workshop. The bins have a capacity of approximately two cubic meters. These are collected by a contractor for recycling as required.

General Waste

General waste is generated in the weighbridge office and workshop, and comprises office rubbish, workshop general garbage and food refuse. Workshop waste is placed into the SITA General Rubbish bin and office rubbish is emptied into the LCC rubbish bin with both collected weekly.

8.4.16.3 Construction Impacts

Wastes generated during construction would potentially include excess spoil material from the reclaim tunnel, scrap steel, waste oils and liquids from maintenance of construction plant and equipment, concrete washdown, sewage effluent and general refuse.

The Construction Environmental Management Plan will detail the control, minimisation, recycling and disposal of wastes. This will likely include:

- Use of portable toilet facilities
- additional waste bins
- separation of recyclable materials for collection
- additional oil collection facilities
- concrete washdown bunkers
- testing and assessment of spoil from the reclaim tunnel excavation for suitability for onsite landscaping use.

Other than the spoil from the reclaim tunnel excavation, the above facilities will be temporary and removed on completion of the construction program. Should the spoil be found to be unsuitable for onsite use it will be transported offsite for suitable disposal.

8.4.16.4 Operation Impacts

During operation, the existing waste management system will continue. It is unlikely that additional waste materials will be produced compared with the present operation.

8.4.16.5 Mitigation

Construction waste materials will be managed in accordance with the principles of the Waste Management hierarchy referred to in the Waste Avoidance and Resource Recovery Act 2001. Centennial will prepare a waste management and re-use plan as part of a Construction Environmental Management Plan (CEMP), addressing all aspects of waste handling.

8.4.16.6 Residual Impacts

There are no anticipated residual impacts in relation to waste generation or disposal.

8.5 Cumulative Effects

This section identifies the potential cumulative effects of the Project together with existing and approved mining operations and other activities in the area. These include:

- **Coal Services Washery Upgrade and Coal Distribution Project -** This project involves an upgrade to the existing washery facility at Centennial Coal Services by constructing additional processing infrastructure. It also involves the construction of haul roads and additional conveyors to transport coal to nominated surrounding coal facilities.

- **Mount Piper power station** including:
  - » Application for a Western Rail Coal Unloader (06_0271) approved in June 2009;
  - » Application for a new Base Load Power Station (MP 09_0119) approved in January 2010; and
  - » Application for the Ash Emplacement project under part 3A (MP 09_0186) approved in February 2012.

  Delta Electricity received approval in June 2009 to construct a rail coal unloader facility north of Mt Piper and Wallerawang Power Stations, near Lithgow. The proposed facilities include a rail loop, connecting to the Mudgee rail line branch, a rail unloader and a conveyor to transport the coal to the power station.
- **Angus Place Mine** - Angus Place is an existing underground longwall mining operation located in the NSW Western Coalfield, approximately 120 km west-northwest of Sydney. In 2010 Angus Place sought to modify its existing NSW Part 3A Project Approval under Section 75 W of the EP&A Act, which included the addition of two longwall panels, 910 (Options 1 and 2) and 900 W. Angus Place also referred this project to the Department of Sustainability, Environment, Water, Population and Communities (SEWPAC). Approval under the NSW EP&A Act for the two longwalls was granted on 29 August 2011. Preliminary documentation has been produced by RPS for the proposed longwalls 910 and 900W, following a controlled action decision by SEWPAC under the EPBC Act.
- **Springvale Mine** including longwalls 415 to 417 - Springvale Coal is a joint venture company owned in equal share by Centennial Springvale Pty Ltd (a wholly owned subsidiary of Banpu Minerals Ltd), and Springvale SK Kores Pty Limited. In 1992, Springvale Coal obtained Development Consent to produce up to 3.4 million tonnes per annum (Mtpa) of Run of Mine (ROM) coal, and longwall mining commenced in 1995.

  Springvale Coal was required to obtain an approved Subsidence Management Plan (SMP) in place prior to the commencement of mining. In 2006, Springvale Coal obtained SMP Approval to extract LWs 411 to 418. Springvale Coal has now sought to obtain approval under the EPBC Act for the proposed LW's 415 to 417. LW's 415 to 417 are located beneath the Newnes State Forest north of Lithgow. Preliminary documentation has been produced by RPS for the proposed longwalls 415 and 417, following a controlled action decision by SEWPAC under the EPBC Act.
- **Pine Dale Coal Mine** - A Part 3A application (10_0041) for an open cut mining extension to the Pine Dale Coal Mine (Yarraboldy Extension); Pine Dale Coal Mine Stage 2 Extension project aims to extend the original Pine Dale Coal Mine (approximately 82ha) and Yarraboldy Extension Area (approximately 27ha) by approximately 210ha. The proponents of the proposal include:
  - » Crushing, stockpiling and maintenance area;
  - » Office, amenities and parking area;
  - » Railway line, spur and rail load-out area;
  - » Internal access roads and private haul road crossing; and
  - » Explosive magazine and/or reload area.

Additional developments in the area which may have a cumulative impact in relation to the Project include:

- Wallerawang power station including approval for a Development Application (024/11DA) in July 2011 for new storage silos;
- Blackmans Flat Waste Management Facility; and
- Western Matrix Mobile Resource Recovery Mill (011/11DA).

Depending on the timing of assessment/project approval, construction of the Lidsdale Siding Upgrade Project could potentially occur in parallel with other local or regional developments as identified above. This presents the possibility for a cumulative impact whereby the potential for impacts associated with individual projects could have a collective affect on particular areas or sections of the community. Due to uncertainty

associated with the potential impacts of other proposed projects and activities this EA can only provide a broad indication of the potential cumulative effects. Cumulative effects of key environmental impacts are outlined as follows:

8.5.1.1 Noise & Vibration

There is currently a proposal by a separate company to haul coal by rail from the Pine Dale Coal mine near Blackmans Flat. This would be along a refurbished rail line that would extend from the current track used by Centennial to access the Lidsdale Siding. The Pine Dale proposal is for an additional 9 trains per week. This would add to the rail traffic noise emissions between Lidsdale and the main line at Wallerawang.

The residential receiver area where cumulative emissions would be relevant is Lidsdale along Duncan Street, refer to Receiver 5 as shown in **Figure 6**. This is approximately 260 metres from the track at its nearest approach in Whalan's Paddock, north of the Siding. Trains for Lidsdale use this line currently to move north of the Siding triangle, then reverse back into it. This movement is all done at very low speed. The nearest other houses exposed to combined movements are in Wallerawang, to the south of the line at Black Gold Cabins in Main Street at 435m distance, and in Blaxland Street Wallerawang, approximately 700m from where the spur-line re-enters the main line. For all of these sections of line, it is expected that train movements would be very slow because of the need to use the Main Street level crossing and to re-enter the main line.

The Noise and Vibration Assessment provides calculations of sound levels from the range of possible numbers of coal train movements along the branch line have been made at the receiver locations shown in **Figure 6** for speeds of 10km/hr and 20 km/hr, assuming that is the maximum speed range of the trains as they approach and enter the siding. Calculations have also been made for four movements per day at additional speeds of 40 km/hr, 50 km/hr and 60 km/hr, assuming that is the speed of the Pine Dale trains. Calculations were also made of the sound levels from the existing 35 Main Western Line diesel movements at 20m distance at Wallerawang (for Black Gold Cabins) and at 260m distance for Blaxland Street. These calculations were made for additional speeds of 70 km/hr, 80 km/hr and 90 km/hr.

The results of the Noise and Vibration Assessment show that sound levels from existing movements on the Main Western Line would range from 58 to 62 dBA LAEq.15h daytime and 59 to 62 dBA LAEq.9h night-time for Black Gold Cabins and 43 to 48 dBA LAEq.15h daytime and 44 to 48 dBA LAEq.9h night-time for Blaxland Street, depending on speed.

For the closest Duncan Street Lidsdale receivers to the branch line, sound levels are calculated to range from 33 to 36 dBA LAEq.15h daytime and 35 to 39 dBA LAEq.9h night-time for the current 4 movements per day or the new Pine Dale movements. These levels overestimate the calculation as the model used assumes full power at the slower speeds (giving a higher SEL because a movement occurs over a longer time period); actual locomotive power at these low speeds will be significantly lower than full power and typically will be 10 dB lower (based on locomotive sound tests at Notch 2). With the additional Centennial Siding movements, the total sound levels at the shunting speeds are calculated to be 41 to 44 dBA LAEq for day or night periods. These sound levels are well below the maximum acceptable range for noise from rail movements for new or existing lines.

Sound levels calculated at Black Gold Cabins are 37 to 40 dBA LAEq for day or night periods depending on speed and number of movements. On their own these levels are considered well below the maximum acceptable sound level range and more than 10 dB below the contribution sound levels from existing train movements. At Blaxland Street the contribution sound levels from the branch line Centennial plus Pine Dale movements are 30 to 33 dBA LAEq for day or night periods. These sound levels are well below the maximum acceptable sound level range. They would also not cause existing sound levels to increase above the maximum acceptable range of sound levels.

Based on these calculations, it is considered that the cumulative effects of sound levels from Centennial and Pine Dale movements on the branch line will be well within the acceptable sound level range.

8.5.1.2 Air Quality & Greenhouse Gas

The air quality in the region surrounding the Project Site is influenced by emissions generated by a range of sources, originating from both within and outside of the local area. Specifically, for the area surrounding the Project Area, air quality will be influenced by emissions from power stations in the area, pollution transported into the area from more distant sources and emissions generated by the Project itself.

To determine the incremental impact of particulate emissions from the Project on the surrounding environment and sensitive receptors, a dispersion modelling exercise has been performed.

To appropriately assess the cumulative impact of the Project, incremental impacts need to be added to a dataset that includes the influences of all other sources of particulate in the region. Given that air quality monitoring locations in the local area are limited to those close to major particulate sources (such as mine sites and power stations) the use of an alternative dataset has been investigated to avoid possible double counting of Project related emissions. Hence the air quality modelling carried out as part of the Air Quality and Greenhouse Gas Assessment has taken into account cumulative background concentrations to demonstrate the current and future air quality environment surrounding the Project Site. As previously mentioned the Project will result in significantly reduced dust deposition rates at all surrounding receptor locations when compared to the current situation. The calculations of annual TSP emissions resulting from current site operations indicate that the emissions are up to 5.5 times greater than what is predicted to be emitted once the site is upgraded. PM10 and PM2.5 emissions are calculated as currently being approximately 4 times greater than those predicted following site upgrade.

8.5.1.3 Surface Water

From the other activities identified in the area only the Wallerawang sewage treatment plant (upstream) and the Wallerawang power station (downstream) are considered to have a direct accumulative connection with current and proposed activity at the Lidsdale siding. Increased discharges from the STP, has the potential to influence the quality of water quality entering surface water system. This is of particular significance with regard to water usage in dust suppression

Although changes to flows and discharge quality to Pipers Flat Creek are considered negligible the nearest downstream receptor to the Lidsdale site is the Wallerawang Power Station therefore any changes to water quality or flow has to be considered when looking at a residual impact to this facility. Surface water used at this facility is drawn principally from Lake Wallace and therefore any changes to flow and quality are also considered negligible.

None of the other developments summarised in conjunction with the Project are predicted to have an increased cumulative impact on surface water resources from current conditions.

8.5.1.4 Groundwater

As a result of the shallow excavation and the low inflow volumes, the impact to the groundwater system from the Project will be minor and the recovery will occur quickly following the cessation of construction. The sewage treatment facility upstream of the site and Wallerawang Power Station downstream of the site are not affecting the groundwater system. However, they are impacting on the surface water and its quality.

The additional dewatering and discharge from excavation and laying of the reclaim tunnel is predicted to add 1.4ML to the surface water system, which will be disposed off in the Control or “dirty water” Pond on site. This water will be used on site and recycled as part of the site water balance.

It is considered that the additional 1.4ML of water that will enter the surface water system over the main construction period is negligible compared to the flow in the Pipers Flat Creek and Coxs River and overall site water balance. Other mines such as Angus Place, Springvale Colliery and Yarraboldy Extension 1 are intercepting overlaying aquifers and are located at such a significant distance from the Project Site that there would be no influence on the groundwater system.

8.5.1.5 Road traffic noise

All coal will be transported to the Project Site by overland conveyor and all coal despatched will be by rail. The Project involves relinquishment of trucking coal into and out of the site which will have significant noise benefits.

During operations, it is expected that there will be approximately 15 light vehicles and 5 trucks accessing the site each day.

Heavy transport vehicles and earth-moving machinery will continue to operate on the site for various purposes and movement of these to and from the site will occur at times. These will be single movements and not affect road traffic noise levels in the area. This means that there will be no road traffic noise issues associated with the Project.

8.5.1.6 Aquatic ecology

Assessment of existing and approved projects in the locality indicate that there will be no adverse cumulative effects on the aquatic ecology of Pipers Flat Creek or Coxs River arising. In fact the proposed creek line rehabilitation works in the lower Pipers Flat Creek are likely to benefit some of the other projects by facilitating flood flow out of the creek to Coxs River.

8.5.1.7 Cultural Heritage

Five sites have been identified near the Piper's Flat Creek, but outside the Project Site, which suggests it is associated to past human occupation in the area. Traditional Owner Ms Lyn Symes (North-East Wiradjuri) has also identified the Cox River (outside the Project Site and broader study area) as a place of cultural significance because the permanent water source would have attracted past hunter-gatherer groups into the region. Although the creek lines are not cultural objects, they are nevertheless places of cultural significance. Given that Lidsdale Siding is situated near or above these water sources, there is a potential risk of contaminating the creeks as a result of industrial works. Secondly, there may be a need to manipulate and change the course of these drainage channels which could detrimentally impact on the contextual setting of the Aboriginal sites. The potential impact is assessed to be low.

Prior to the field survey undertaken for this report, ten Aboriginal sites had been previously recorded in the surrounding area. The identification of six newly recorded sites brings the total number of sites to 16. In the event that the six newly recorded sites were to be salvaged under a Section 90 AHIP, this would be destroying 37.5% of all sites in the surrounding region. The cumulative impact of the proposed development is that there will be fewer sites remaining intact.

No cumulative impacts have been identified for Soils, Land Resources and Agriculture, Contamination, Social, Economics Visual and Waste impacts.

9.0 Statement of Commitments

9.1 Introduction

The mitigation measures that will be required to avoid or reduce the potential environmental impacts of the Project have been identified within each of the specialist assessments as summarised in Section 8 of the EA.

The mitigation measures aim to minimise and or mitigate, as far as practical, the potential impacts associated with the Project. These measures have informed the development of the draft Statement of Commitments that Centennial will undertake as part of the construction and operation of the Project. The draft Statement of Commitments may be revised in response to stakeholder and community input during the display of the Environmental Assessment. Any contractor involved in the future design, construction and/or operation of the Project will be required to undertake all works in accordance with this Statement of Commitments.

9.2 Commitments

Table 31 below outlines Statement of Commitments, including commitments relating to key issues identified within Section 7 and Section 8 of this EA. Common commitments between key environmental issues have been amalgamated.

Table 31: Statement of Commitments

Issue	Commitment	Phase
Noise and vibration	▪ A Construction Noise Management Plan will be prepared as part of the CEMP.	Prior to Construction
	▪ Use of mobile plant with a specified operating sound power level of 105 dBA.	Operation
	▪ Sound power levels from all new plant and equipment will meet the specified levels as described in the Noise Impact Assessment prepared by Hatch 2012 reference H-338807.	Operation
	▪ A Noise Management Plan will be prepared for the ongoing operation and will include recommended mitigation strategies and ongoing monitoring as described in this EA to ensure noise objectives are being achieved.	Operation
Air quality	▪ An Air Quality Management Plan will be prepared as part of the CEMP	Prior to Construction
	▪ Design and implementation of a site specific study to determine the characteristics of coal being transported off-site. The study will determine the Dust Extinction Moisture (DEM) level of the coal as it is transported from Lidsdale Siding. This study will allow a quantification of the likely particulate matter emissions from each coal surface type and also identify the efficacy of dust mitigation measures over the likely time of transport from site to Port and may result in further mitigation measures for the control of dust from rail transport.	
	▪ Water sprays will be located on the main stockpile to reduce particulate emissions due to wind erosion.	As part of construction works
	▪ Water sprays will be located at the coal transfer point.	As part of construction works
	▪ Completion of the EPL PRP and implementation of recommended actions	As part of construction works
Greenhouse gas	▪ Identify and implement cost effective measures to improve energy efficiency;	Construction & Operation
	▪ Regular maintenance of plant and equipment to minimise fuel consumption; and	
	▪ Consideration of energy efficiency in plant and equipment selection/phase.	
Surface water,	▪ Implement an erosion and sediment control strategy as part of the	During

Issue	Commitment	Phase
soils and agriculture	Construction Environmental Management Plan.	construction
	▪ Erosion and sediment controls will be implemented as per Managing Urban Stormwater: soils and construction (Landcom, 2004) during construction	During construction
	▪ Contaminated water will be contained on site and moved towards the containment ponds	During construction
	▪ Surface water sampling and analysis will be undertaken prior to discharge in accordance with the EPL	During construction
	▪ A site water management plan will be prepared prior to commissioning the new infrastructure.	Prior to commissioning
Groundwater	▪ Implement a groundwater management plan as part of the Construction Environmental Management Plan	Construction & Operation
	▪ Apply for a water extraction licence for the construction period and adhere to any specific conditions of the licence.	Prior to construction
Contamination	▪ A Remediation Action Plan will be developed to the satisfaction of OEH and will include a program for the remediation of identified contamination on site.	Six months from the date of consent
	▪ The production bore construction will be altered so groundwater is not allowed to migrate between aquifers.	During construction
Visual	▪ A visual screen consisting of native tree and shrub species comparable to the existing forested areas to the north of the site will be planted (as per Figure 4) and will take into consideration the removal of existing willow trees.	Within 5 years following completion of construction
	▪ The main conveyor and bin structures will be colour treated to reduce reflection and contrast against the existing backdrop.	During construction
Traffic and transport	▪ A construction traffic management plan will be prepared and implemented as part of the CEMP.	Prior to Construction
	▪ Contribute to the upgrade of road line marking on Main Street to satisfy AS1742.7-2007, Manual of Uniform Traffic Control, Part 7: Railway Crossings.	As part of construction works
Terrestrial ecology	• A Construction Environmental Management Plan (CEMP) will be prepared and implemented that will include measures to minimise erosion and sedimentation impacts upon waterways and associated vegetation resulting during construction and minimise vegetation clearing, particularly within those areas that contain Eucalyptus aggregate .	During Construction
	• All construction machinery will be cleaned prior to entering the site	Commence prior to construction and then annually
	• A program of weed monitoring will be undertaken and potential weed infestations appropriately managed to ensure surrounding communities are protected from invasive species.	
Aquatic ecology	▪ Coal material on the northern side of the rail siding will be removed and adequate drainage installed.	During Construction
	▪ Progressive removal of Willows within the section of Pipers Flat Creek which passes through the Study Area	A 5 year program of works following completion of construction
Heritage	Prepare an Aboriginal Cultural Heritage Management Plan (ACHMP) as part of the CEMP. The ACHMP is to include provisions for further consultation with Indigenous communities involved in the archaeology study for any actions affecting identified archaeological sites.	Prior to Construction
	▪ The five artefact scatters and isolated finds located within the broader study area will be protected by the erection of visible protection fence and included in any site inductions as necessary.	During construction and ongoing operation
	▪ In the event that any work is to occur where the five identified sites are located in SU1a and SU1b, appropriate approvals will be sought to salvage the artefacts	Ongoing

10.0 Justification and Conclusion

10.1 Justification

10.1.1 Environmental Considerations

Consideration of potential impacts on the environment is fundamental to the Lidsdale Siding Upgrade Project. The Project will allow improvements to be made to the existing air quality, noise and greenhouse gas impacts over current operations.

The Project is likely result to result in a measurable improvement in air quality in the local area and is unlikely to contribute to any exceedances of the respective NSW OEH criteria for the pollutants assessed due to implementation of the automatic loading system and removal of incoming coal trucks, internal transport of coal and loading trains with front end loaders.

The current noise environment would improve through reduction in handling of coal by vehicles and machinery and new site infrastructure components being designed and/or specified to meet noise criteria. The improved efficiency of the site would result in a lower greenhouse gas production per tonne of coal moved through the site. The expected visual impacts of the Project will be moderate. Visual screening and other measures proposed will reduce but not eliminate such impacts.

The footprint of the Project will be within the existing operational areas of the site, with the exception of the extension of the rail track. As a result the majority of direct impacts are restricted to already disturbed areas.

Centennial has shown a commitment to the principles of ESD and understands that social, economic and environmental objectives are interdependent. Centennial acknowledges that a well designed and effectively managed operation would avoid significant and/or costly environmental impact or degradation. The existing EPL and the existing environmental management plans have been developed to appropriately identify mitigate and manage environmental risk. These demonstrate environmental due diligence and provide procedures for on-going management and monitoring of the operation in line with the objectives of ESD.

During construction aspects of the biophysical environment such as surface and groundwater, noise, dust and traffic will be protected through the implementation of a CEMP. Throughout this EA, mitigation and remediation measures have been identified to ensure that the potential impacts of the Project are managed appropriately. These mitigation measures are presented as a Statement of Commitments, refer to Section 9.

10.1.2 Social Impact

The Lidsdale Siding has been in operation for approximately 33 years. The Project represents a change that would incorporate beneficial impacts on the social environment. As a result of the Project there will be improvements to the current noise and air quality environments for the residents within proximity to the site. Local businesses may also benefit from increased patronage from construction workers during the construction period.

The design of the Project has aimed to reduce potential social impacts, such as noise and air quality, and would not substantially change any existing land uses or require any property acquisition. The Project incorporates mitigation measures to address other potential social impacts such as traffic and visual. These measures have been incorporated into the Statement of Commitments (refer Section 9). Having regard to the proposed management and mitigation measures, the expected social impacts of the proposal are considered acceptable.

10.1.3 Economic Considerations

The Project will provide for the efficient and economic transfer of coal as part of Centennial Coal's Western Mines region operations, while allowing environmental and social improvements for the local community in regards to noise and air quality.

The Project may stimulate an additional $1.4 Billion in economic activity and 2,637 full time equivalent (FTE) jobs in the regional economy over the assumed 15 year project forecast. This is a result of the direct economic stimulus of the development works, coupled with greater output and more efficient operation of the siding. In the operating phase, the activity facilitated by the Project may support $6.3 billion in economic activity in the regional economy over the 15-year period observed.

In addition to these direct economic benefits to the regional and state economy, there are broader benefits to the State in the form of royalty revenues associated with the increase in export production that the Project will facilitate. It is estimated that the Project will result in increases in royalty revenue for NSW of approximately $54 million, over the forecast period based on presently held price assumptions.

10.2 Conclusion

Centennial has a long term commitment to ensuring that mining operations are carried out in accordance with the principles of ecologically sustainable development. This Project has been developed taking these principles into account along with the environmental, economic and social considerations. The EA has identified the likely environmental impacts together with mitigation measures to ameliorate those effects.

This EA has been prepared in support of an application under Section 75F(3) of Part 3A of the EP&A Act seeking project approval.

The Project will improve the operational efficiency of the site. The train loading process would essentially be automated by establishing a main elongated conical stockpile with underground reclaimers feeding a ground conveyor leading to a train loading bin. The total stockpile capacity would remain at approximately 50,000 tonnes. The Project will increase the throughput capacity for coal delivered to the siding by conveyor to approximately 6.3 Mtpa and remove coal transport to the site by road. The Project will result in improved environmental management and remove the loading of trains by front end loaders and transport of coal internally by trucks. In addition to the matters prescribed in the Director General's Requirements, a risk based and consultative approach has been relied on in preparing this Environmental Assessment. The risk assessment identifies aspects of the proposed project where further information or investigation was needed to address any existing knowledge gaps. It also addresses any need to improve existing mitigation measures to ensure the residual risk for the proposal is acceptably low.

There are potential cumulative effects associated with the Project from a number of activities associated with use of the existing rail line and also by two other State Significant proposals within the Coxs River Catchment. Other impacts are negligible or minimal and/or able to be ameliorated with recommended mitigation measures. There are positive consequences from aspects of the Project such as the improvements to noise and air quality and from the continued operation having social benefits of that to the local community.

Based on the assessments undertaken within this EA the impact of the Project could be kept to a minimum provided that the mitigation measures identified in this EA are employed.

11.0 References

AECOM Australia Pty Ltd (AECOM), 2009. *Contamination Investigation, Lidsdale Coal Loader and Rail Siding Facility*. 10 August 2009.

Australian and New Zealand Environment Conservation Council and Agriculture Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ) 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. October.

King, D.P (1992). *Soil Landscapes of the Wallerawang 1:100,000 Sheet*. Department of Conservation & Land Management, Sydney. (Source: Mr Neil Peden, RSTM Western Region)

Connell Hatch 2008, *Preliminary Environmental Assessment, Lidsdale Siding upgrade, Ivanhoe Coal*. 17 September.

Connell Hatch 2009, *Draft Phase 1 Environmental Site Assessment, Lidsdale Siding upgrade, Ivanhoe Coal*. 31 March

Macquarie Geotech 2008. *Geotechnical Investigation – Proposed Train Loading Facility*, Lidsdale Sidings, Wallerawang. 2 April.