Centennial Coal

STATEMENT OF ENVIRONMENTAL EFFECTS

Western Coal Services Project

State Significant Development 5579

Modification 2

Volume 2 – Appendices

August 2017

APPENDIX LIST

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Development Consent SSD 5579

APPENDIX – A

Development Consent

Section 89E of the *Environmental Planning & Assessment Act 1979*

As delegate of the Minister for Planning and Infrastructure under delegation from the Minister dated 14 September 2011, the Planning Assessment Commission of NSW approves the project application referred to in Schedule 1, subject to the conditions in Schedules 2 to 5.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.

Gabrielle Kibble AO
Member of the Commission

Alan Coutts
Member of the Commission

Sydney 4 April 2014

SCHEDULE 1

Application Number:	SSD-5579
Applicant:	Springvale Coal Pty Limited
Consent Authority:	Minister for Planning and Infrastructure
Land:	See Appendix 1
Development:	Western Coal Services Project

19 June 2017 modification (MOD 1) in red type

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DEFINITIONS

Annual review	The review required by condition 4 of Schedule 5
Applicant	Springvale Coal Pty Limited, or any other person or persons who rely on this consent to carry out the development that is subject to this consent
BCA	Building Code of Australia
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
Conditions of this consent	Conditions contained in Schedules 2 to 5 inclusive
Consent	This development consent
CPI	Australian Bureau of Statistics Consumer Price Index
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Department	Department of Planning and Environment
Development	The development described in the EIS
DPI Water	Department of Primary Industries Water Division
EIS	Environmental Impact Statement titled *Western Coal Services Project Environmental Impact Statement,* dated July 2013, and associated response to submissions titled *Western Coal Services Project Response to Submissions,* dated October 2013 Statement of Environmental Effects titled *Western Coal Services Project State Significant Development 5579 – Modification 1* (dated November 2016) including the associated Response to Submissions (dated February 2017).
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence issued under the POEO Act
Evening	The period from 6pm to 10pm
Feasible	Feasible relates to engineering considerations and what is practical to build or carry out
Heritage item	An item as defined under the *Heritage Act 1977* and/or an Aboriginal Object or Aboriginal Place as defined under the *National Parks and Wildlife Act 1974*
ICNG	The EPA's *Interim Construction Noise Guideline (2010),* or its latest version
Incident	A set of circumstances that: • causes or threatens to cause material harm to the environment; and/or • breaches or exceeds the limits or performance measures/criteria in this consent
Land	As defined in the EP&A Act, except for where the term is used in the noise and air quality conditions in Schedules 3 and 4 of this consent where it is defined to mean the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this consent
LCC	Lithgow City Council
Material harm to the environment	Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial
Coal transportation and processing operations	Includes the following, where carried out on the site: • processing, handling and storage of coal; • transportation of coal by private haul road or conveyor; and • transportation and emplacement of coal rejects.
Minister	Minister for Planning, or delegate
Minor	Not very large, important or serious
Mitigation	Activities associated with reducing the impacts of the development
Negligible	Small and unimportant, such as to be not worth considering
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
OEH	Office of Environment and Heritage
POEO Act	*Protection of the Environment Operations Act 1997*
Privately-owned land	Land that is not owned by a public agency or a mining or power generation company (or its subsidiary)
Product coal	Saleable coal transported from the site, whether processed or unprocessed.
Public infrastructure	Linear and related infrastructure and the like that provides services to the general public, such as roads, railways, water supply, drainage, sewerage, gas supply, electricity, telephone, telecommunications, etc

Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Rehabilitation	The treatment or management of land disturbed by the development for the purpose of establishing a safe, stable and non-polluting environment
Remediation	Activities associated with partially or fully repairing or rehabilitating the impacts of the development or controlling the environmental consequences of this impact
Residual Waste	Suspended solids liquid waste stream generated from the Springvale Water Treatment Project
RMS	Roads and Maritime Services
ROM coal	Run of Mine coal
Secretary	Secretary of the Department, or nominee
Springvale Water Treatment Project	Springvale Water Treatment Project (SSD 7592)
SCSS	Springvale Coal Services Site
Site	All land within the development area as listed in Appendix 1 and shown in Appendix 2

SCHEDULE 2
ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance criteria established under this consent, the Applicant shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.

TERMS OF CONSENT

2. The Applicant shall carry out the development generally in accordance with the:
   (a) EIS;
   (b) statement of commitments; and
   (c) conditions of this consent.

   Notes:
   - *The general layout of the development is shown in Appendix 3.*
   - *The Applicant's statement of commitments is shown in Appendix 8.*

3. If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this consent shall prevail to the extent of any inconsistency.

4. The Applicant shall comply with any reasonable requirement/s of the Secretary arising from the Department's assessment of:
   (a) any strategies, plans, programs, reviews, audits, reports or correspondence that are submitted in accordance with this consent; and
   (b) the implementation of any actions or measures contained in these documents.

LIMITS ON CONSENT

5. The Applicant may carry out coal transportation and processing operations on the site until 30 June 2039.

   Note: Under this consent, the Applicant is required to rehabilitate the site and perform additional undertakings to the satisfaction of both the Secretary and the Director Environmental Sustainability. Consequently, this consent will continue to apply in all other respects other than the right to conduct coal transportation and processing operations until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.

Coal Processing

6. The Applicant shall not:
   (a) receive more than a total of 9.5 million tonnes of ROM coal at the SCSS in any calendar year, including not more than 1.0 million tonnes of ROM coal from sites other than Angus Place and Springvale Collieries; and
   (b) process more than 7 million tonnes of ROM coal at the SCSS in any calendar year.

Coal Transport

7. The Applicant shall ensure that all product coal is transported from the SCSS by conveyor.

8. The Applicant shall ensure that not more than 6.3 million tonnes of product coal is transported from the SCSS to the Lidsdale Siding Coal Loader in any calendar year.

Residual Waste

8A. The Applicant must not receive or emplace more than 0.35 megalitres per day (annual average) or 0.43 megalitres per day (daily maximum) of residual waste from the Springvale Water Treatment Project.

SURRENDER OF EXISTING DEVELOPMENT CONSENTS

9. Prior to the end of December 2015, or as otherwise agreed by the Secretary, the Applicant shall surrender all existing development consents or approvals that it holds for the site in accordance with section 104A of the EP&A Act.

   Note: This requirement does not extend to the surrender of construction and occupation certificates for existing and proposed building works under Part 4A of the EP&A Act. Surrender of a consent should not be understood as implying that works legally constructed under a valid consent can no longer be legally maintained or used.

10. Prior to the surrender of any existing development consent, the conditions of this consent shall prevail to the extent of any inconsistency with the conditions of that consent.

STRUCTURAL ADEQUACY

11. The Applicant shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

Notes:

- *Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works; and*
- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the development.*

DEMOLITION

12. The Applicant shall ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures,* or its latest version.

PROTECTION OF PUBLIC INFRASTRUCTURE

13. Unless the Applicant and the applicable authority agree otherwise, the Applicant shall:
    (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and
    (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development.

Note: This condition does not apply to damage to roads caused as a result of general road usage.

OPERATION OF PLANT AND EQUIPMENT

14. The Applicant shall ensure that all plant and equipment used at the site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

STAGED SUBMISSION OF STRATEGIES, PLANS OR PROGRAMS

15. With the approval of the Secretary, the Applicant may submit any strategy, plan or program required by this consent on a progressive basis.

Notes:

- *While any strategy, plan or program may be submitted on a progressive basis, the Applicant will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.*
- *If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.*

16. Until they are replaced by an equivalent strategy, plan or program approved under this consent, the Applicant shall implement the existing strategies, plans or programs for the site that have been approved under existing development consents or approvals.

OTHER DEVELOPMENTS ON THE SCSS

17. The Applicant shall consult and engage with the proponents/applicants of other approved developments/projects on the SCSS, with the aim of maximising the outcomes of all developments/projects with respect to:
    - operational efficiencies;
    - water, noise and air quality management;
    - biodiversity conservation;
    - rehabilitation; and
    - future land uses.

SCHEDULE 3
ENVIRONMENTAL PERFORMANCE CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from an owner of the land listed in Table 1, the Applicant shall acquire the land in accordance with the procedures in conditions 5-6 of Schedule 4.

Table 1: Land subject to acquisition upon request

Property ID	
B4 - Blackmans Flat	Mason (east) – Wolgan Road

Note: To interpret the locations referred to in Table 1 see the applicable figure in Appendix 4.

ADDITIONAL MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 1, the Applicant shall implement additional noise mitigation measures (such as double glazing, insulation, and/or air conditioning) at the residence in consultation with the owner. These measures must be reasonable and feasible and directed towards reducing the noise impacts of the development on the residence.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

NOISE

Construction Noise

3. The Applicant shall prepare and implement a Construction Noise Management Plan prepared in accordance with the EPA's *Interim Construction Noise Guideline 2009* (or any relevant updated version), to the satisfaction of the Secretary. This plan must be prepared in consultation with the EPA, and be approved by the Secretary prior to commencing construction.

Construction Hours

4. The Applicant may only undertake construction activities between the hours of 7am to 6pm Monday to Friday, and 8am to 1pm Saturday, with no construction activities on Sundays or public holidays, unless otherwise agreed to by the Secretary in accordance with condition 5 of Schedule 3.

Out of Hours Construction Works

5. If the Applicant proposes to undertake any construction works outside the hours specified in condition 4 of Schedule 3, then the Applicant must prepare and implement an Out of Hours Work Protocol for these works to the satisfaction of the Secretary. This protocol must be prepared in consultation with the EPA and the residents who would be affected by the noise generated by these works, and be consistent with the requirements of the ICNG. The Applicant shall not carry out any out of hours construction works before this protocol has been approved by the Secretary.

Hours of Operation

6. Except for the carrying out of construction, the Applicant shall comply with the operating hours in Table 2.

Table 2: Operating hours

Activity	***Operating Hours***
Coal transportation operations on the Angus Place to Wallerawang power station haul road	No truck movements to take place during the Night
Coal transportation operations on the Angus Place to Mount Piper power station haul road	No truck movement to occur during adverse meteorological conditions during the Night
Kerosene Vale Coal Stockpile operations	During the Day only
All other operational activities	24 hours a day, 7 days per week

Noise Criteria

7. Except for the carrying out of construction, and for the land in Table 1, the Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land.

Table 3: Noise criteria dB(A)

Land	***Day*** $L_{Aeq(15\ min)}$	***Evening*** $L_{Aeq(15\ min)}$	***Night*** $L_{Aeq(15\ min)}$	***Night*** $L_{A1\ (1\ min)}$
B12	40	35	35	47
B13	41	36	36	50
B14	41	35	35	55
B15	36	35	35	45
B16	35	35	36	45
B17	42	44	45	45
W1	37	37	41	45
W2	35	35	36	45
L1	42	35	35	45
L2	40	39	35	45
WR1	41	38	36	57
WR2	38	37	35	48
S3	36	36	39	45
All other privately-owned residences	35	35	35	45

Note: To interpret the locations referred to in Table 3 see the applicable figure in Appendix 4.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy*. Appendix 5 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

8. The Applicant shall:
   (a) implement best management practice to minimise the construction, operational and road noise of the development;
   (b) operate a comprehensive noise management system that uses a combination of predictive meteorological forecasting and real-time noise monitoring data to guide the day-to-day planning of coal transport and processing operations, and the implementation of both proactive and reactive noise mitigation measures to ensure compliance with the relevant conditions of this consent;
   (c) minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 5);
   (d) co-ordinate noise management on site with the noise management of other approved developments and/or projects on or in the vicinity of the site to minimise cumulative noise impacts; and
   (e) carry out regular monitoring to determine whether the development is complying with the relevant conditions of this consent,

   to the satisfaction of the Secretary.

Noise Management Plan

9. The Applicant shall prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:

(a) be prepared in consultation with the EPA, and submitted to the Secretary for approval within 4 months of the date of this consent, unless otherwise agreed by the Secretary;
(b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent;
(c) describe the proposed noise management system in detail; and
(d) include a monitoring program that:
- evaluates and reports on:
  - the effectiveness of the on-site noise management system;
  - compliance against the noise criteria in this consent; and
  - compliance with the noise operating conditions;
- includes a program to calibrate and validate real-time noise monitoring results with attended monitoring results over time (so the real-time noise monitoring program can be used as a better indicator of compliance with the noise criteria and as a trigger for further attended monitoring); and
- defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.

BLASTING

Restriction on Blasting

10. The Applicant shall only carry out blasting on site to construct the Link Haul Road and only between 9 am and 5 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Secretary.

Operating Conditions

11. The Applicant shall:
(a) implement best blasting management practice to:
- protect the safety of people in the surrounding area;
- protect public infrastructure and private property in the surrounding area from any damage; and
- minimise the dust and fume emissions of any blasting;

(b) minimise the frequency and duration of any required road closures;
(c) consult with, and obtain the approval of, the RMS for any blasts within 500 metres of the Castlereagh Highway; and
(d) operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site,
to the satisfaction of the Secretary.

AIR QUALITY

Odour

12. The Applicant shall ensure that no offensive odours, as defined under the POEO Act, are emitted by the development.

Air Quality Criteria

13. The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria in Tables 4, 5 and 6 at any residence on privately-owned land.

Table 4: Long-term criteria for particulate matter

Pollutant	***Averaging Period***	[d] ***Criterion***
Total suspended particulate (TSP) matter	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 30 µg/m^3

Table 5: Short-term criteria for particulate matter

Pollutant	***Averaging Period***	[d] ***Criterion***
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 50 µg/m^3

Table 6: Long-term criteria for deposited dust

Pollutant	***Averaging Period***	***Maximum increase in deposited dust level***	***Maximum total deposited dust level***
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

Notes to Tables 4 - 6:

[a] Total impact (ie incremental increase in concentrations due to the development plus background concentrations due to all other sources).

[b] Incremental impact (ie incremental increase in concentrations due to the development on its own).

[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.

[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.

[e] "Reasonable and feasible avoidance measures" includes, but is not limited to, the operational requirements in condition 17 to develop and implement a real-time air quality management system that ensures operational responses to the risks of exceedance of the criteria.

Mine-owned Land

14. The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria in Tables 4, 5 and 6 at any occupied residence on mine-owned land unless:
    (a) the tenant and landowner (if the residence is owned by another mining or power generation company) have been notified of any health risks associated with such exceedances in accordance with the notification requirements under Schedule 4 of this consent;
    (b) the tenant of any land owned by the Applicant can terminate their tenancy agreement without penalty at any time, subject to giving reasonable notice;
    (c) air mitigation measures such as air filters, a first flush roof water drainage system and/or air conditioning) are installed at the residence, if requested by the tenant or landowner (if the residence is owned by another mining or power generation company);
    (d) air quality monitoring is regularly undertaken to inform the tenant or landowner (if the residence is owned by another mining or power generation company) of the actual particulate emissions at the residence; and
    (e) data from this monitoring is presented to the tenant or landowner in an appropriate format for a medical practitioner to assist the tenant and/or landowner (if the residence is owned by another mining or power generation company) in making informed decisions on health risks associated with occupying the property,

    to the satisfaction of the Secretary.

Air Quality Acquisition Criteria

15. If particulate matter emissions generated by the development exceed the criteria, or contribute to an exceedance of the relevant cumulative criteria, in Tables 7, 8 or 9, at any residence on privately-owned land, then upon receiving a written request for acquisition from the landowner the Applicant shall acquire the land in accordance with the procedures in conditions 5-6 of Schedule 4.

Table 7: Long term land acquisition criteria for particulate matter

Pollutant	***Averaging period***	***[d] Criterion***
Total suspended particulate (TSP) matter	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 30 µg/m^3

Table 8: Short term land acquisition criteria for particulate matter

Pollutant	***Averaging period***	***[d] Criterion***
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 150 µg/m^3
Particulate matter < 10 µm (PM_{10})	24 hour	[b] 50 µg/m^3

Table 9: Long term land acquisition criteria for deposited dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

Notes to Tables 7-9:
a Total impact (ie incremental increase in concentrations due to the development plus background concentrations due to all other sources);
b Incremental impact (ie incremental increase in concentrations due to the development on its own);
c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method*;*
d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, or any other activity agreed by the Secretary.

Operating Conditions

16. The Applicant shall:
    (a) implement best practice management to minimise the off-site odour, fume and dust emissions of the development;
    (b) implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site;
    (c) minimise the surface disturbance of the site;
    (d) minimise any visible off-site air pollution generated by the development;
    (e) operate a comprehensive air quality management system that uses a combination of predictive meteorological forecasting, predictive air dispersion modelling and air quality monitoring data to guide the day-to-day planning of coal transportation and processing operations and implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this consent; and
    (f) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 7-9 above),
    to the satisfaction of the Secretary.

Air Quality Management Plan

17. The Applicant shall prepare and implement an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with the EPA, and submitted to the Secretary for approval within 4 months of the date of this consent, unless otherwise agreed by the Secretary;
    (b) describe the measures that would be implemented to ensure compliance with the relevant air quality criteria and operating conditions of this consent;
    (c) describe the proposed air quality management system; and
    (d) include an air quality monitoring program that:
        - uses a combination of at least one tapered element oscillating microbalance air quality monitor, sited in the vicinity of Blackmans Flat, and supplementary monitors to evaluate the performance of the development against the air quality criteria in this consent;
        - adequately supports the proactive and reactive air quality management system;
        - evaluates and reports on:
            - the effectiveness of the air quality management system; and
            - compliance with the air quality operating conditions; and
        - defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents.

METEOROLOGICAL MONITORING

18. For the life of the development, the Applicant shall ensure that there is a meteorological station in the vicinity of the site that:
    (a) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline; and
    (b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the *NSW Industrial Noise Policy*, unless a suitable alternative is approved by the Secretary following consultation with the EPA.

SOIL AND WATER

Water Supply

19. The Applicant shall ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of operations on site to match its available water supply.

Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain the necessary water licences for the development.

Water Pollution

20. Unless an EPL authorises otherwise, the Applicant shall comply with Section 120 of the POEO Act.

Remediation of Soil Contamination

21. Within 4 months of the date of this consent, unless otherwise agreed by the Secretary, the Applicant shall commence a Phase 2 Contamination Assessment for the SCSS.

22. The Applicant shall manage the remediation of the SCSS and the Kerosene Vale Coal Stockpile Area to the satisfaction of the EPA.

23. The Applicant shall comply with the performance measures in Table 10 to the satisfaction of the Secretary.

Table 10: Water Management Performance Measures

Feature	***Performance Measure***
Potable Water	• Minimise the use of potable water for purposes where non-potable water is acceptable
Construction and operation	• Design, install and maintain erosion and sediment controls generally in accordance with the series *Managing Urban Stormwater: Soils and Construction* including *Volume 1, Volume 2A – Installation of Services* and *Volume 2C – Unsealed Roads*, or its latest version • Design, install and maintain all works within 40 m of watercourses generally in accordance with the *Guidelines for Controlled Activities on Waterfront Land (DPI 2012)*, or its latest version • Design, installation and maintenance of creek crossings generally in accordance with the *Policy and Guidelines for Fish Friendly Waterway Crossings* (NSW Fisheries, 2003) and *Why Do Fish Need To Cross The Road? Fish Passage Requirements for Waterway Crossings* (NSW Fisheries 2003), or their latest versions
Sediment Dams	• Design, install and maintain dams generally in accordance with *Managing Urban Stormwater: Soils and Construction – Volume 1 and Volume 2E Mines and Quarries*, or its latest version
Clean water diversions & storage infrastructure	• Design, install and maintain the clean water system to capture and convey the 100 year ARI flood, as far as is reasonable and feasible • Maximise diversion of clean water around disturbed areas, as far as is reasonable and feasible
Mine-water storages	• Design, install and maintain the mine-water storage infrastructure to store all runoff from a 95 percentile 5 day rain event • Prevent seepage from the DML and Cooks Dams to the surface, as far as is reasonable and feasible
Chemical and hydrocarbon storage	• Chemical and hydrocarbon products to be stored in bunded areas in accordance with the relevant Australian Standards
Aquatic and riparian ecosystems, including affected sections of Wangcol and Lamberts Gully Creeks	• Maintain or improve baseline channel stability • Develop site-specific in-stream water quality objectives in accordance with ANZECC 2000 and *Using the ANZECC Guidelines and Water Quality Objectives in NSW* procedures (DECC 2006), or its latest version

Water Management Plan

24. The Applicant shall prepare and implement a Water Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with the EPA, WaterNSW, DPI Water, LCC, Forestry Corporation of NSW and Energy Australia by suitably qualified and experienced person/s whose appointment has been approved by the Secretary;
    (b) be submitted to the Secretary for approval within 4 months of the date of this consent, unless otherwise agreed by the Secretary; and
    (c) include a:
        (i) Site Water Balance, that:
            - includes details of:
                - sources and security of water supply, including contingency supply for future reporting periods;
                - water use and management on site;
                - any off-site water discharges; and
                - reporting procedures, including the preparation of a site water balance for each calendar year; and
            - investigates and implements all reasonable and feasible measures to minimise potable water use and to re-use and recycle water;
        (ii) Surface Water Management Plan, that includes:
            - detailed baseline data on water flows and quality in the watercourses that could potentially be affected by the development;
            - a detailed description of the SCSS water management system, including the:
                - clean water diversion systems;
                - erosion and sediment controls; and
                - mine-water management systems;
            - detailed plans, including design objectives and performance criteria for:
                - design and management for the emplacement of coal reject materials and potential acid-forming or sulphate-generating materials;
                - management of sodic and dispersible soils;
                - reinstatement of appropriate drainage lines on the rehabilitated areas of the site; and
                - control of any potential water pollution from the rehabilitated areas of the site;
            - performance criteria for the following, including trigger levels for investigating any associated potentially adverse impacts:
                - SCSS water management system;
                - downstream surface water quality; and
                - stream and riparian vegetation health for the Wangcol and Lamberts Gully Creeks;
            - a program to monitor and report on:
                - effectiveness of the SCSS water management system; and
                - surface water flows and quality in the watercourses potentially affected by the development; and
            - reporting procedures for the results of the monitoring program; and
            - a plan to respond to any exceedences of the performance criteria, and mitigate and/or offset any adverse surface water impacts of the development;
        (iii) Groundwater Management Plan that includes:
            - detailed baseline data of groundwater levels, yield and quality on the SCSS and surrounds that could be affected by the development, including any licensed privately-owned groundwater bores;
            - groundwater impact assessment criteria including trigger levels for investigating any potentially adverse groundwater impacts;
            - a program to monitor and report on:
                - groundwater inflows to former open cut pits;
                - the seepage/leachate from water storages, emplacements of power station ash and/or coal rejects, and former open cut voids;
                - background changes in groundwater yield/quality against changes induced by the development; and
                - impacts of the development on:
                    - regional and local (including alluvial) aquifers;
                    - groundwater supply of any potentially affected private landowners; and
                    - any potentially affected groundwater dependent ecosystems and riparian vegetation;
            - a program to validate the groundwater model for the development, including an independent review of the model every 3 years, and comparison of monitoring results with modelled predictions; and
            - a plan to respond to any exceedences of the performance criteria; and

(iv) protocol that has been prepared in consultation with the owners of nearby power generation or mining developments to:

- minimise cumulative water quality impacts;
- review opportunities for water sharing/water transfers between these developments;
- co-ordinate water quality monitoring programs as far as practicable;
- undertake joint investigations/studies in relation to complaints/exceedences of trigger levels where cumulative impacts are considered likely; and
- co-ordinate modelling programs for validation, re-calibration and re-running of groundwater and surface water models.

Note: The protocol can be developed in stages and will need to be subject to ongoing review, dependent upon the determination of, and commencement of, other mining and/or power generation developments in the area.

BIODIVERSITY

Biodiversity Offset Strategy

25. By the end of December 2016, the Applicant shall, to the satisfaction of the Secretary:
    (a) provide an area that is suitable in its vegetation types and extent to satisfactorily offset the impacts of clearing 10.67 hectares of native vegetation (*Coxs Permian Red Stringybark – Brittle Gum Woodland*); and
    (b) make suitable arrangements to manage, protect and provide long-term security for this area, consistent with the relevant NSW Offsets policy.

Additional Rehabilitation Initiatives

26. The Applicant shall implement the Additional Rehabilitation Initiatives for the Lamberts Gully Creek catchment on the SCSS by the establishment and enhancement of locally endemic native vegetation species and improvement of fauna habitat values in the areas shown in Appendix 7, to the satisfaction of the Secretary.

Riparian Habitat and Catchment Improvement Plan

27. The Applicant must prepare and implement a Riparian Habitat and Catchment Improvement Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with Local Land Services, OEH, EPA and WaterNSW, and be submitted to the Secretary for approval by the end of October 2017;
    (b) describe the measures that would be implemented to improve and maintain the riparian habitat of Wangcol Creek for at least 100 metres downstream of the proposed Link Haul Road bridge crossing of the creek;
    (c) detail additional compensatory water quality and catchment improvement measures to the value of at least $250,000 which must be undertaken prior to the commissioning of the Springvale Water Treatment Project; and
    (d) make arrangements to manage, protect and provide for the long-term security for the measures proposed to respond to (b) and (c) above.

Habitat for Threatened Fauna Species

28. The Applicant shall ensure that the Biodiversity Offset Strategy and Additional Rehabilitation Initiatives areas, in combination, provide suitable habitat for threatened fauna species recorded on the SCSS, namely the:
    - Brown Treecreeper;
    - Gang-gang Cockatoo;
    - Little Eagle;
    - Scarlet Robin;
    - Large-eared Pied Bat;
    - Eastern Falsistrelle;
    - Eastern Bent Wing Bat; and
    - Yellow Bellied Sheathtail Bat.

Biodiversity Management Plan

29. The Applicant shall prepare and implement a Biodiversity Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with OEH and Forestry Corporation of NSW, and be submitted to the Secretary for approval by the end of December 2016;
    (b) describe the short, medium, and long-term measures that would be implemented to:
        - manage remnant vegetation and habitat on the site; and

- implement the Biodiversity Offset Strategy;

(c) include detailed performance and completion criteria for evaluating the performance of the Biodiversity Offset Strategy, and triggering any necessary remedial action;

(d) include a detailed description of the measures that would be implemented over the next 3 years (to be updated for each 3-year period following initial preparation of the plan) for:
- enhancing the quality of existing vegetation and fauna habitat;
- establishing native vegetation and fauna habitat in the Additional Rehabilitation Initiatives area through focusing on assisted natural regeneration, targeted vegetation establishment and the introduction of naturally scarce fauna habitat features (where necessary);
- enhancing the landscaping of the site and along public roads to minimise visual and lighting impacts, particularly along the Castlereagh Highway;
- protecting vegetation and soil outside the approved disturbance area;
- maximising the salvage of resources within the approved disturbance area – including tree hollows and vegetative and soil resources – for beneficial reuse in the biodiversity offset strategy;
- collecting and propagating seed;
- minimising the impacts to fauna on site, including undertaking pre-clearance surveys;
- managing any potential conflicts between the proposed restoration works in the Additional Rehabilitation Initiatives area and any Aboriginal heritage values (both cultural and archaeological);
- managing salinity;
- controlling weeds and feral pests;
- controlling erosion;
- controlling access; and
- managing bushfire risk;

(e) include a program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria;

(f) identify the potential risks to the successful implementation of the Biodiversity Offset Strategy, and include a description of the contingency measures that would be implemented to mitigate against these risks; and

(g) include details of who would be responsible for monitoring, reviewing, and implementing the plan.

Note: The Biodiversity Management Plan and Rehabilitation Management Plan require substantial integration to achieve biodiversity objectives for the undisturbed and rehabilitated areas of the SCSS.

Conservation Bond

30. Within 6 months of the approval of the Biodiversity Management Plan, unless the Secretary agrees otherwise, the Applicant shall lodge a Conservation Bond with the Department to ensure that the Biodiversity Offset Strategy is implemented in accordance with the performance and completion criteria of the Biodiversity Management Plan.

The sum of the bond shall be determined by:

(a) calculating the full cost of implementing the Biodiversity Offset Strategy (other than land acquisition costs); and

(b) employing a suitably qualified quantity surveyor to verify the calculated costs.

If the offset strategy is completed generally in accordance with the completion criteria in the Biodiversity Management Plan to the satisfaction of the Secretary, the Secretary will release the bond.

If the offset strategy is not completed generally in accordance with the completion criteria in the Biodiversity Management Plan, the Secretary will call in all, or part of, the conservation bond, and arrange for the satisfactory completion of the relevant works.

Notes:
- *Alternative funding arrangements for long-term management of the Biodiversity Offset Strategy, such as provision of capital and management funding as agreed by OEH as part of a Biobanking Agreement or transfer to the conservation reserve estate can be used to reduce the liability of the conservation bond.*
- *The sum of the bond may be reviewed in conjunction with any revision to the Biodiversity Management Plan.*

HERITAGE

Protection of Aboriginal Sites

31. The Applicant shall ensure that the development does not cause any direct or indirect impact on identified Aboriginal sites located outside the approved disturbance area of the development on the site.

Heritage Management Plan

32. The Applicant shall prepare and implement a Heritage Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;
    (b) be prepared in consultation with OEH and local Aboriginal stakeholders (in relation to the management of Aboriginal heritage values);
    (c) be submitted to the Secretary for approval within 6 months of the date of this consent, unless the Secretary agrees otherwise;
    (d) include a description of the measures that would be implemented for:
        - addressing relevant statutory requirements under the *National Parks and Wildlife Act 1974;*
        - protecting, monitoring and managing Aboriginal sites outside the approved disturbance area (including sites shown on the figure in Appendix 6, with particular attention to site 45-1-0218);
        - maintaining and managing reasonable access for Aboriginal stakeholders to cultural heritage items on site;
        - managing the discovery of any human remains or previously unidentified Aboriginal objects on site, including (in the case of human remains) stop work provisions and notification protocols;
        - ongoing consultation with local Aboriginal stakeholders in the conservation and management of Aboriginal cultural heritage both on-site and in the Biodiversity Offset Strategy area; and
        - ensuring any workers on site receive suitable heritage inductions prior to carrying out any activities which may disturb Aboriginal sites, and that suitable records are kept of these inductions.

TRANSPORT

Intersection Upgrade

33. Within 6 months of the date of this consent, unless the Secretary agrees otherwise, the Applicant shall re-paint line markings at the intersection of the Castlereagh Highway and the SCSS Access Road to the satisfaction of RMS.

Castlereagh Highway Overbridge

34. The Applicant shall design, construct and operate the Link Haul Road overbridge of the Castlereagh Highway at no cost to, and to the satisfaction of, RMS.

Construction Traffic Management Plan

35. The Applicant shall prepare and implement a Construction Traffic Management Plan for the development, to the satisfaction of the Secretary. This plan shall be prepared in consultation with LCC and RMS, and must be submitted to the Secretary for approval prior to the commencement of construction activities on the site. This plan must address:
    (a) management of wide loads;
    (b) minimising inconvenience to the public, particularly during the construction of the Link Haul Road overbridge of the Castlereagh Highway; and
    (c) maintaining public safety.

Road Maintenance – Private Haul Roads

36. Within 3 months of the date of consent, until coal transportation ceases on each respective haul road, unless otherwise agreed by the Secretary, the Applicant shall maintain the surface of the haul roads from Angus Place to Mount Piper and Wallerawang power stations with a smooth sealed surface, effectively free of potholes, indentations or other unevenness of the surface that would cause noise levels from traffic travelling on the road to exceed the sleep disturbance criteria in Table 3, to the satisfaction of the Secretary.

37. Within 3 months of the date of consent, and every 6 months thereafter until coal transportation ceases on each respective haul road, unless otherwise agreed by the Secretary, the Applicant shall arrange and pay the cost of independent inspections and condition reports of the surface of the haul roads from Angus Place to Mount Piper and Wallerawang power stations by an independent road maintenance expert, approved by the Secretary. Copies of the inspection and condition reports must be forwarded to the Secretary at the same time as they are provided to the Applicant.

38. If any haul road condition report, referred to in condition 37, recommends repair or remedial works in order to prevent exceedances of the sleep disturbance criteria in Table 3, then the Applicant must not undertake trucking operations on the affected haul road at Night until the recommended repair and/or remedial works are undertaken to the satisfaction of the independent road maintenance expert.

Transport Monitoring

39. The Applicant shall monitor and report on:
    (a) the amount of coal transported to and from the site; and
    (b) the date and time of each truck movement of coal or coal rejects to and from the site;
    to the satisfaction of the Secretary.

VISUAL

Operating Conditions

40. The Applicant shall:
    (a) implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the development;
    (b) ensure no fixed outdoor lights or mobile lighting rigs shine above the horizontal;
    (c) ensure that all external lighting associated with the development complies with *Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting* or its latest version;
    (d) ensure revegetation works associated with the batters of the Link Haul Road overbridge of the Castlereagh Highway are undertaken as soon as practicable and maintained to reduce visual impacts;
    (e) employ reasonable and feasible landscaping measures to minimise visual impacts of all private haul roads forming part of the development; and
    (f) ensure that the visual appearance of all buildings, structures, facilities or works (including paint colours and specifications) is aimed at blending as far as possible with the surrounding landscape,
    to the satisfaction of the Secretary**.**

BUSHFIRE MANAGEMENT

41. The Applicant shall:
    (a) ensure that the development is suitably equipped to respond to any fires on site; and
    (b) assist the Rural Fire Service, emergency services and Forestry Corporation of NSW as much as possible if there is a fire in the surrounding area.

WASTE

42. The Applicant shall:
    (a) implement all reasonable and feasible measures to minimise the waste (including coal reject) generated by the development;
    (b) ensure that the waste generated by the development is appropriately stored, handled and disposed of; and
    (c) monitor and report on the effectiveness of waste minimisation and management measures in the Annual Review.

REHABILITATION

Rehabilitation Objectives

43. The Applicant shall rehabilitate the site to the satisfaction of the Director Environmental Sustainability. This rehabilitation must be generally consistent with the proposed Rehabilitation Strategy described in the EIS (and shown conceptually in Appendix 7) and comply with the objectives in Table 11.

Table 11: Rehabilitation objectives

Feature	***Objective***
Site (as a whole)	Safe, stable and non-polluting Constructed landforms drain to the natural environment Minimise visual impact of final landforms as far as is reasonable and feasible
Lands on which other approved developments exist or are proposed, such as Energy Australia's ash emplacement or LCC's waste management facility	Final land use to be determined in consultation with, and the agreement of the landowner The default objective for all land where a final land use is not otherwise agreed is to rehabilitate to the standards required for "Remainder of the SCSS" in this table
Surface infrastructure	To be decommissioned and removed, unless the Director Environmental Sustainability agrees otherwise

Feature	*Objective*
Castlereagh Highway overbridge	To be decommissioned and removed, unless the Director Environmental Sustainability and RMS agrees otherwise
Portion of Ben Bullen State Forest within the SCSS	To be managed to the satisfaction of the Forestry Corporation of NSW with the implementation of biodiversity enhancement measures, including weed and feral animal control
Remainder of the SCSS	Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprising: • a wildlife corridor (shown as Additional Rehabilitation Initiatives in the figure in Appendix 7); • local native plant species; and • a landform consistent with the surrounding environment
Community	Ensure public safety Minimise the adverse socio-economic effects associated with closure of the development

Progressive Rehabilitation

44. The Applicant shall progressively rehabilitate the site, including the Kerosene Vale Stockpile Area, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim rehabilitation strategies must be employed where areas prone to dust generation are not subject to active operations but cannot yet be permanently rehabilitated.

Note: It is accepted that parts of the site that are progressively rehabilitated may be subject to further disturbance in future.

Rehabilitation Management Plan

45. The Applicant shall prepare and implement a Rehabilitation Management Plan to the satisfaction of the Director Environmental Sustainability. This plan must:
    (a) be prepared in consultation with the Department, EPA, DPI Water, OEH, WaterNSW, Forestry Corporation of NSW, CCC and LCC;
    (b) be submitted to the Director Environmental Sustainability for approval within 4 months of the date of this consent; unless the Director Environmental Sustainability agrees otherwise;
    (c) be prepared in accordance with any relevant Department guideline;
    (d) describe how the rehabilitation of the site would be integrated with the implementation of the Biodiversity Management Plan;
    (e) include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, and triggering remedial action (if necessary);
    (f) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, and address all aspects of rehabilitation including facility closure, final landform and final land use;
    (g) include interim rehabilitation where necessary to minimise the area exposed for dust generation;
    (h) include a program to monitor, independently audit and report on the effectiveness of the rehabilitation measures and progress against the detailed performance and completion criteria; and
    (i) build to the maximum extent practicable on the other management plans required under this consent.

Note: The Biodiversity Management Plan and Rehabilitation Management Plan require substantial integration to achieve biodiversity objectives for the undisturbed and rehabilitated areas of the SCSS.

Pollution Reduction Works

46. Prior to receiving any residual waste from the operation of the Springvale Water Treatment Project, the Applicant must complete the following pollution reduction works to the satisfaction of the EPA:
    (a) Establish a groundwater monitoring network across the Springvale Coal Services site that comprises an adequate number of bores that are located, established and operated in such a manner that will provide an understanding of surface water and groundwater interactions across the site;
    (b) Design and install run-off diversion works to divert all clean water run-off generated from catchment areas up-gradient of the Springvale Coal Services Site; and
    (c) Investigate options for long term management and discharge and/or beneficial reuse, of groundwater presently discharging from the site through LDP 006.

SCHEDULE 4
ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS/TENANTS

1. Within 1 month of the date of this consent, unless the Secretary agrees otherwise, the Applicant shall:
   (a) notify in writing the owners of:
      - the land listed in Table 1 of Schedule 3 that they have the right to require the Applicant to acquire their land at any stage during the development; and
      - any residence listed in condition 2 of Schedule 3, that they have the right to request the Applicant for additional noise mitigation measures to be installed at their residence at any stage during the development;

   (b) notify the tenants of any mine-owned land of their rights under this consent; and
   (c) send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the owners and/or existing tenants of any land (including mine-owned land) where the predictions in the EIS identify that dust emissions generated by the development are likely to be greater than the relevant air quality criteria in Schedule 3 at any time during the life of the development.

2. Prior to entering into any tenancy agreement for any land owned by the Applicant that is predicted to experience exceedances of the recommended dust and/or noise criteria, or for any of the land listed in Table 1 that is subsequently purchased by the Applicant, the Applicant shall:
   (a) advise the prospective tenants of the potential health and amenity impacts associated with living on the land, and give them a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time); and
   (b) advise the prospective tenants of the rights they would have under this consent,

   to the satisfaction of the Secretary.

3. As soon as practicable after obtaining monitoring results showing:
   (a) an exceedance of any relevant criteria in Schedule 3, the Applicant shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the development is again complying with the relevant criteria; and
   (b) an exceedance of the relevant air quality criteria in Schedule 3, the Applicant shall send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).

INDEPENDENT REVIEW

4. If an owner of privately-owned land considers the development to be exceeding the criteria in Schedule 3, then he/she may ask the Secretary in writing for an independent review of the impacts of the development on his/her land.

   If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision, the Applicant shall:
   (a) commission a suitably qualified, experienced and independent expert, whose appointment has been approved by the Secretary, to:
      - consult with the landowner to determine his/her concerns;
      - conduct monitoring to determine whether the development is complying with the relevant impact assessment criteria in Schedule 3; and
      - if the development is not complying with these criteria then:
         - determine if more than one mine or development is responsible for the exceedance, and if so the relative share of each mine or development regarding the impact on the land; and
         - identify the measures that could be implemented to ensure compliance with the relevant criteria; and

   (b) give the Secretary and landowner a copy of the independent review.

LAND ACQUISITION

5. Within 3 months of receiving a written request from a landowner with acquisition rights, the Applicant shall make a binding written offer to the landowner based on:
   (a) the current market value of the landowner's interest in the land at the date of this written request, as if the land was unaffected by the development, having regard to the:
      - existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and

- presence of improvements on the land and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of the additional noise mitigation measures in condition 2 of Schedule 3;

(b) the reasonable costs associated with:
- relocating within the Lithgow local government area, or to any other local government area determined by the Secretary; and
- obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is to be acquired; and

(c) reasonable compensation for any disturbance caused by the land acquisition process.

However, if at the end of this period, the Applicant and landowner cannot agree on the acquisition price of the land and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Secretary for resolution.

Upon receiving such a request, the Secretary will request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer to:
- consider submissions from both parties;
- determine a fair and reasonable acquisition price for the land and/or the terms upon which the land is to be acquired, having regard to the matters referred to in paragraphs (a)-(c) above;
- prepare a detailed report setting out the reasons for any determination; and
- provide a copy of the report to both parties.

Within 14 days of receiving the independent valuer's report, the Applicant shall make a binding written offer to the landowner to purchase the land at a price not less than the independent valuer's determination.

However, if either party disputes the independent valuer's determination, then within 14 days of receiving the independent valuer's report, they may refer the matter to the Secretary for review. Any request for a review must be accompanied by a detailed report setting out the reasons why the party disputes the independent valuer's determination. Following consultation with the independent valuer and both parties, the Secretary will determine a fair and reasonable acquisition price for the land, having regard to the matters referred to in paragraphs (a)-(c) above, the independent valuer's report, the detailed report of the party that disputes the independent valuer's determination and any other relevant submissions.

Within 14 days of this determination, the Applicant shall make a binding written offer to the landowner to purchase the land at a price not less than the Secretary's determination.

If the landowner refuses to accept the Applicant's binding written offer under this condition within 6 months of the offer being made, then the Applicant's obligations to acquire the land shall cease, unless the Secretary determines otherwise.

6. The Applicant shall pay all reasonable costs associated with the land acquisition process described in condition 5 above, including the costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of this plan at the Office of the Registrar-General.

SCHEDULE 5
ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Applicant shall prepare and implement an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:
   (a) be submitted to the Secretary for approval within 6 months of the date of this approval, unless the Secretary agrees otherwise;
   (b) provide the strategic framework for environmental management of the development;
   (c) identify the statutory approvals that apply to the development;
   (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;
   (e) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the mining complex;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise;
      - respond to any non-compliance;
      - respond to emergencies; and
   (f) include:
      - copies of any strategies, plans and programs approved under the conditions of this consent; and
      - a clear plan depicting all the monitoring to be carried out in relation to the development.

Adaptive Management

2. The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

   Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:
   (a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;
   (b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and
   (c) implement remediation measures as directed by the Secretary,
   to the satisfaction of the Secretary.

Management Plan Requirements

3. The Applicant shall ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:
   (a) detailed baseline data;
   (b) a description of:
      - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
      - any relevant limits or performance measures/criteria;
      - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;
   (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
   (d) a program to monitor and report on the:
      - impacts and environmental performance of the development;
      - effectiveness of any management measures (see c above);
   (e) a contingency plan to manage any unpredicted impacts and their consequences;
   (f) a program to investigate and implement ways to improve the environmental performance of the development over time;
   (g) a protocol for managing and reporting any:
      - incidents;
      - complaints;
      - non-compliances with statutory requirements; and
      - exceedances of the impact assessment criteria and/or performance criteria; and
   (h) a protocol for periodic review of the plan.

Annual Review

4. By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must:
   (a) describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;
   (b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the:
      - the relevant statutory requirements, limits or performance measures/criteria;
      - the monitoring results of previous years; and
      - the relevant predictions in the EIS;
   (c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
   (d) identify any trends in the monitoring data over the life of the development;
   (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and
   (f) describe what measures will be implemented over the next year to improve the environmental performance of the development.

Revision of Strategies, Plans and Programs

5. Within 3 months of:
   (a) the submission of an annual review under Condition 4 above;
   (b) the submission of an incident report under Condition 7 below;
   (c) the submission of an audit report under Condition 9 below; or
   (d) any modification to the conditions of this consent, (unless the conditions require otherwise),

   the Applicant shall review the strategies, plans, and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.

   Note: The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve environmental performance of the development.

Community Consultative Committee

6. Within 3 months of the date of this consent, the Applicant shall establish and operate a regional Community Consultative Committee (CCC) for the development in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007, or its latest version), and to the satisfaction of the Secretary. This CCC is to service this development and any other approved project and/or development operated by the company in the Wallerawang district.

   Notes:
   - *The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Applicant complies with this consent; and*
   - *The CCC should be comprised of an independent chair and appropriate representation from the Applicant, LCC, recognised environmental groups and the local community to the satisfaction of the Secretary.*

REPORTING

Incident Reporting

7. The Applicant shall immediately notify the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the development, the Applicant shall notify the Secretary and any other relevant agencies as soon as practicable after the Applicant becomes aware of the incident. Within 7 days of the date of the incident, the Applicant shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

Regular Reporting

8. The Applicant shall provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.

INDEPENDENT ENVIRONMENTAL AUDIT

Independent Environmental Audit

9. By the end of December 2015, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
   (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
   (b) include consultation with the relevant agencies;
   (c) assess the environmental performance of the development and assess whether it is complying with the requirements in this consent, and any other relevant approvals, relevant EPL/s and/or Mining Lease/s (including any assessment, plan or program required under these approvals);
   (d) review the adequacy of any approved strategy, plan or program required under the abovementioned approvals; and
   (e) recommend measures or actions to improve the environmental performance of the development, and/or any strategy, plan or program required under these approvals.

   Note: This audit team must be led by a suitably qualified auditor, and include experts in field specified by the Secretary.

10. Within 3 months of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.

ACCESS TO INFORMATION

11. The Applicant shall:
   (a) make the following information publicly available on its website:
      - the EIS;
      - all current statutory approvals for the development;
      - approved strategies, plans or programs required under the conditions of this consent;
      - a comprehensive summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent;
      - a complaints register, which is to be updated on a monthly basis;
      - minutes of CCC meetings;
      - the last five annual reviews;
      - any independent environmental audit, and the Applicant's response to the recommendations in any audit;
      - any other matter required by the Secretary; and
   (b) keep this information up to date,

   to the satisfaction of the Secretary.

APPENDIX 1
SCHEDULE OF LAND

Land within area subject of the EIS	**Centennial Fassifern Pty Ltd**
	Lots 2 and 4 DP 260621
	Lot 1 DP 386554
	Lot 3 DP 542432
	Lots 32, 41, 57 and 351 DP 751636
	Lots 43, 51 and 406 DP 751651
	Lots 120, 121 and 124 DP 1188105
	Lots 138, 139, 140, 141, 142, 143, 144 and 145 DP 1185660
	Lots 1, 3 and 4 DP 1139982
	Lot 1 DP 400022
	Lot 1 DP 920999
	Lots 2 and 3 DP 1151441
	Centennial Springvale Pty Ltd and Springvale Kores Pty Ltd
	Lot 1 DP 88503
	Lots 1 and 2 DP 126483
	Lot 13 and 357 DP 751651
	Lot 501 DP 825541
	Lot 2 DP 835651
	Coal Link>Pty Ltd
	Lot 1 DP 825887
	Council of the City of Lithgow
	Lot 42 DP 751636
	Lot 1 DP 1049889
	Lot 1 DP 1127043
	Lot 4 DP 1151441
	Delta Electricity
	Lot 191 DP 629212
	Lots 1 and 2 DP 702619
	Lot 67 DP 751636
	Lot 1 DP 803655
	Lots 9 and 15 DP 804929
	Lot 1 DP 825124
	Lots 140, 146, 147, 148, 149, 151 and 152 DP 1185660
	Lots 3 and 5 DP 829137
	Lot 101 DP 829410

	Lot 16 DP 855844
	Lot 2 DP 1018958
	Lots 1 and 5 DP 1087684
	Lot 228 DP 1131953
	Lots 10 and 11 DP 1139978
	Lots 2 and 3 DP 1139982
	Lot 103 DP 1164619
	Enhance Place Pty Ltd
	Lots 132, 135, 136, 137 138, 139, 140 and 141 DP 1188105
	Lot 10 DP 877753
	Lot 29 DP 1096381
	State of NSW / Ben Bullen State Forest
	Lot 70 DP 751636
	Lot 502 DP 825541
	Lot 7005 DP 1026541
	Lots 290 and 291 DP 751636
	Ivanhoe Coal Pty Ltd
	Lot 2 DP 567915
	Lots 16, 174, 375 and 385 DP 751651
	Lot 101 DP 1137972
	Private Owner (Janette Winifred Hunt)
	Lot 371 DP 751651
	Lidsdale Holdings Pty Ltd
	Lot 128 DP 1188105
	State Rail Authority
	Lots 1 and 8 DP 252472
	Crown Roads
	Lots 4, 5, 9 and 10 DP 1187371
	Lot 70 DP 751636
	Lot 7005 DP 1026541

APPENDIX 2
DEVELOPMENT AREA

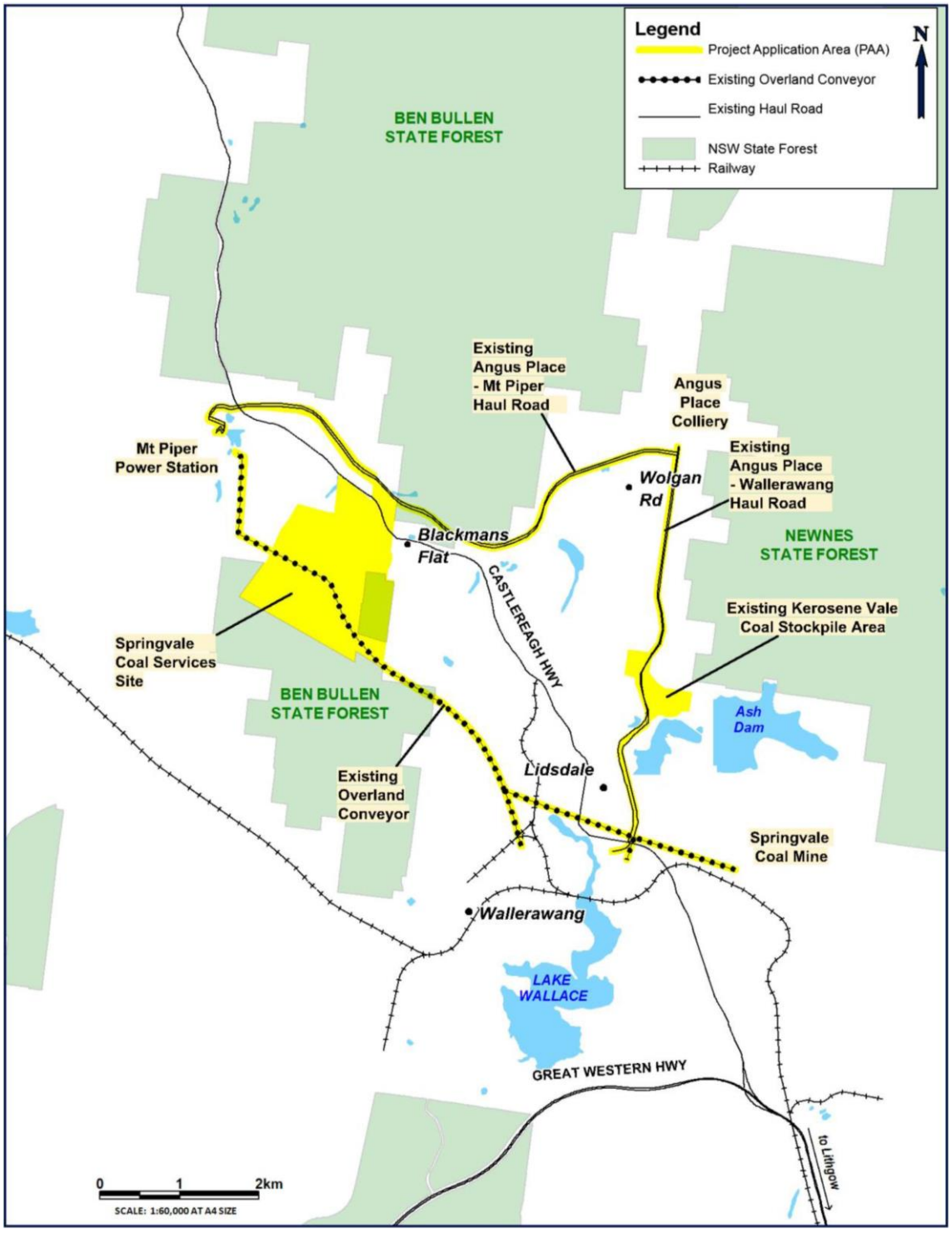

Figure 1: *Western Coal Services Project – Development Area*

APPENDIX 3
DEVELOPMENT LAYOUT

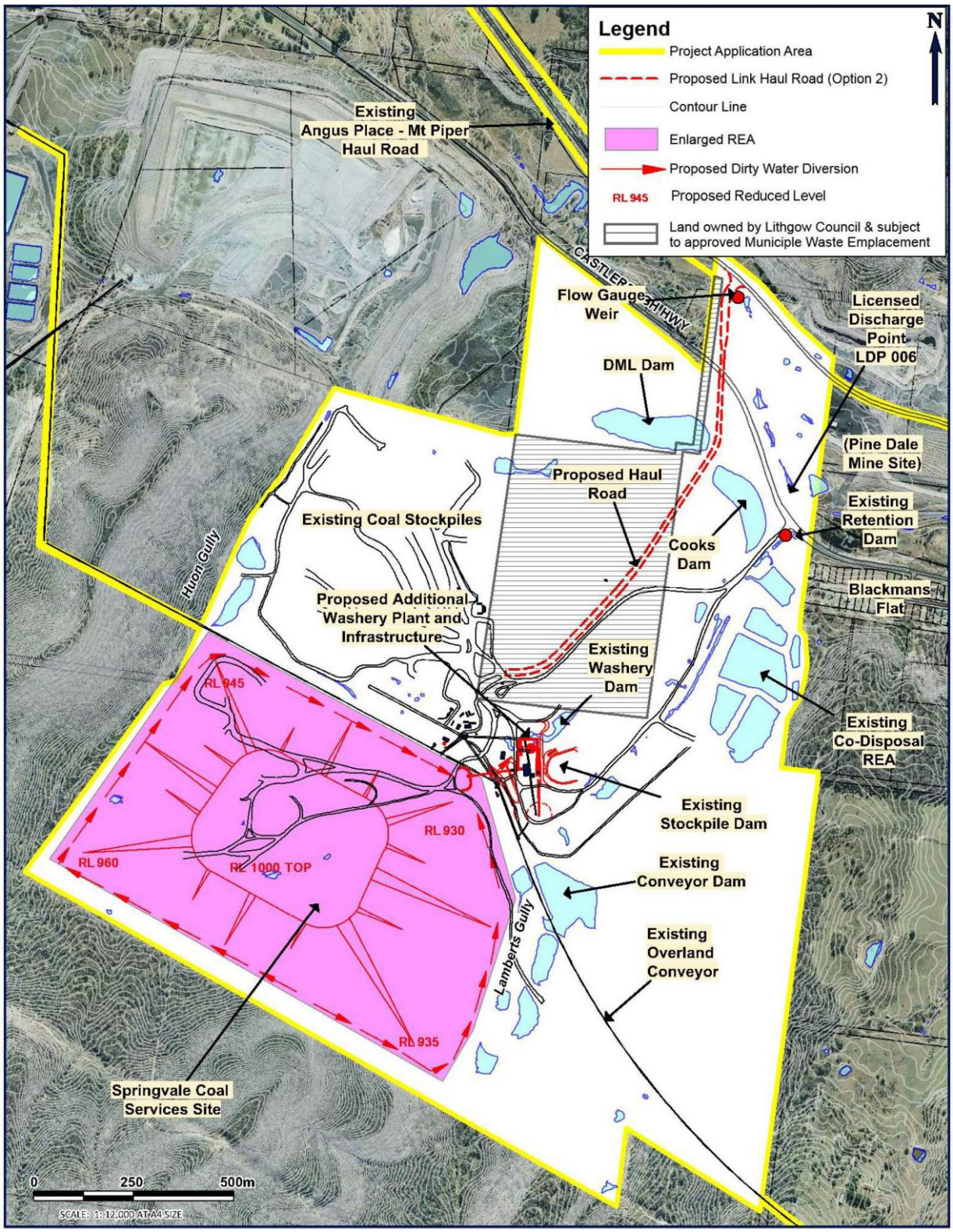

Figure 1: *General layout of proposed infrastructure on the SCSS*

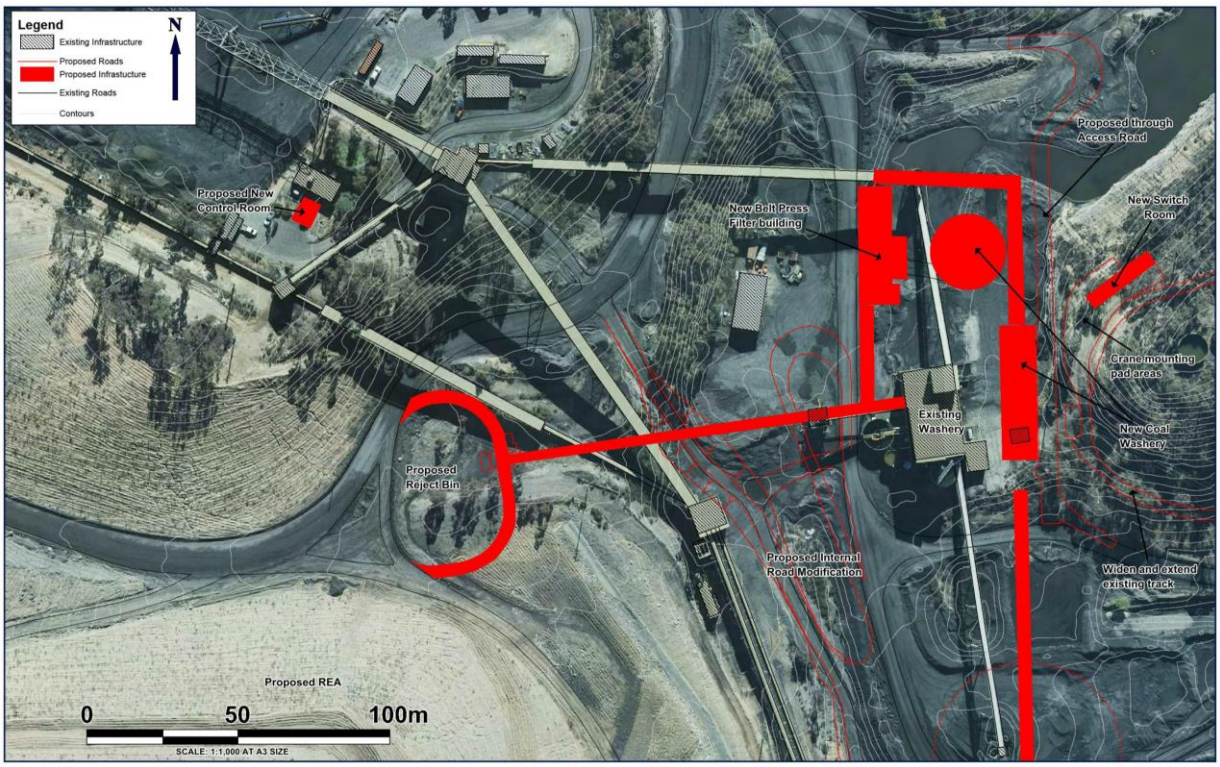

Figure 2: *General layout of proposed upgrade to the CHPP on the SCSS*

APPENDIX 4
RECEIVER LOCATIONS

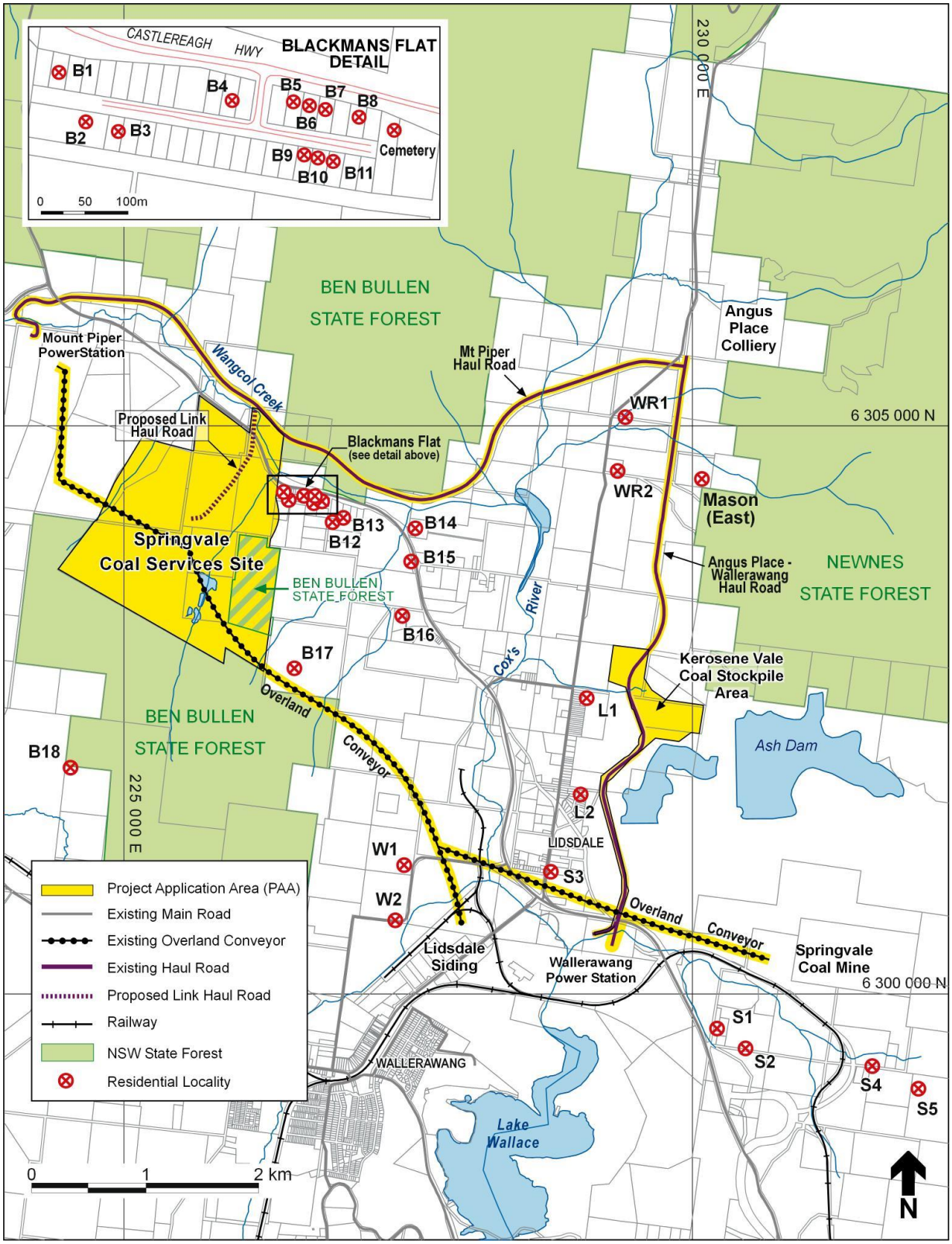

***Figure 1**: Residential locations used for noise and air quality predictions*

APPENDIX 5
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 in Schedule 3 are to apply under all meteorological conditions except the following:
   (a) average wind speed at microphone height exceeds 5 m/s;
   (b) wind speeds greater than 3 m/s measured at 10 m above ground level; or
   (c) temperature inversion conditions greater than 3°C/100 m.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station required under condition 18 of Schedule 3.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times in each calendar year (ie at least once in every calendar month), unless the Secretary directs otherwise.

5. Unless the Secretary agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

APPENDIX 6
ABORIGINAL CULTURAL HERITAGE SITES

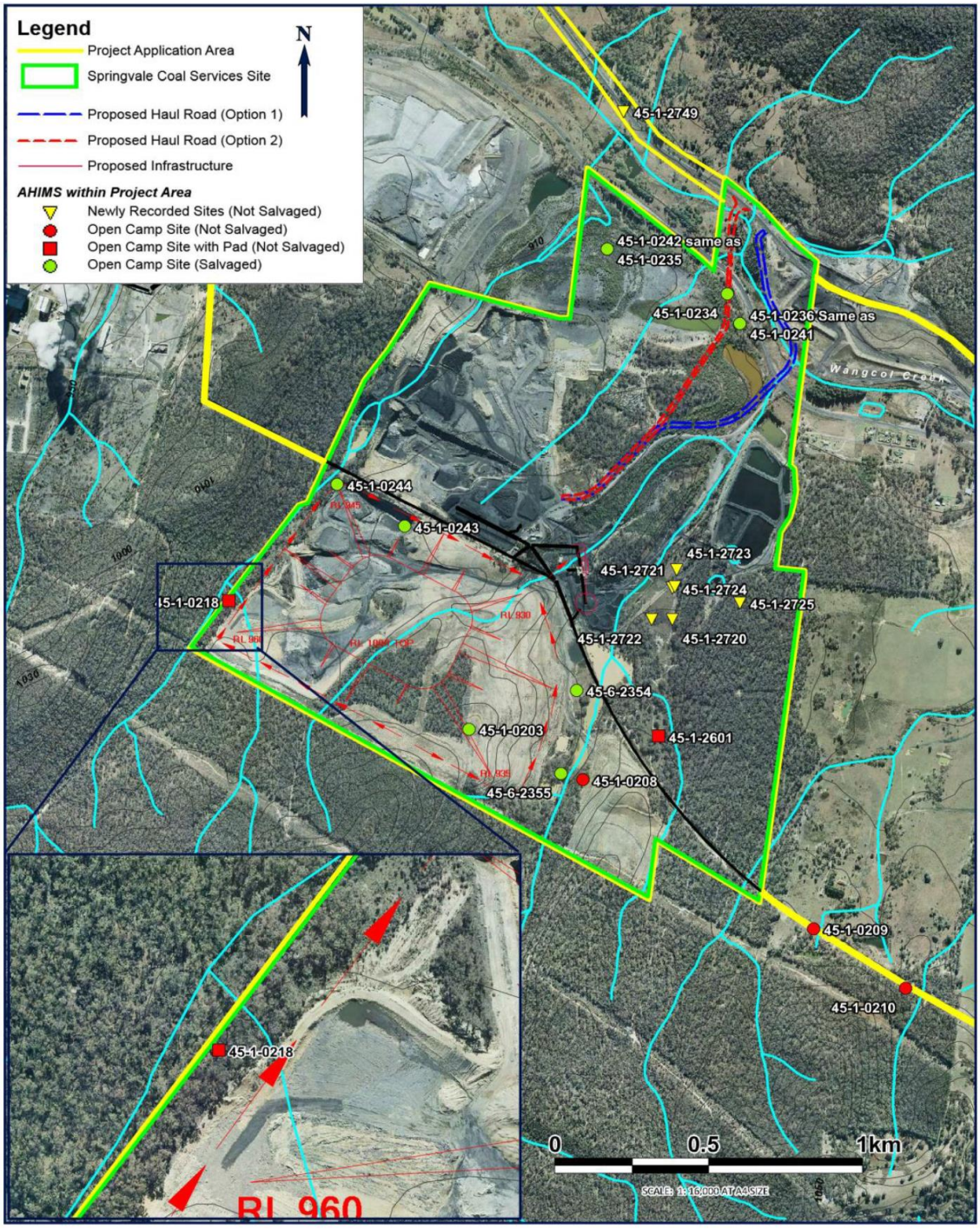

Figure 1: *Location of Aboriginal cultural heritage sites*

APPENDIX 7
ADDITIONAL REHABILITATION INITIATIVES

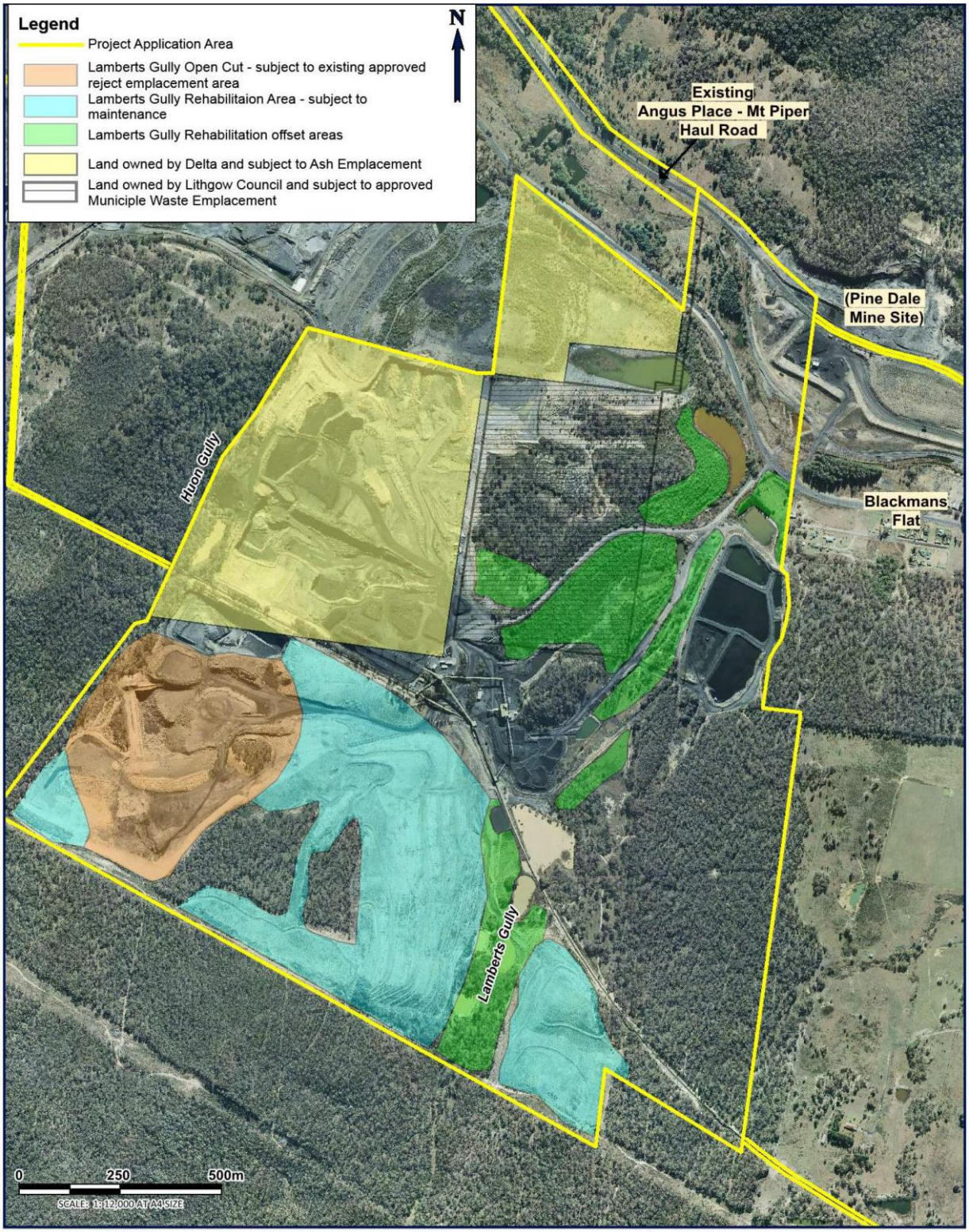

Figure 1: *Location of Additional Rehabilitation Initiatives at SCSS (in green)*

APPENDIX 8
STATEMENT OF COMMITMENTS

EIS Table 66 - Project Development Phase – Statement of Commitments

Desired Outcome	Action
Development Phase	
All construction operations are appropriately undertaken to minimise potential impacts to the environment.	**1.1** Appropriate erosion and sediment control measures will be implemented for construction of the upgrading of the Washery and associated infrastructure (additional conveyors and transfer points on the Springvale Coal Services Site, refer to Figure 8 of the EIS), extension and enlargement of the existing REA, and construction of the Link Haul Road and overpass of the Castlereagh Highway and will be installed prior to commencement of disturbance activities, generally in accordance with the guidelines '*Managing Urban Stormwater – Soils and Construction, Volume 2E: Mines and Quarries' (DECC 2008)*. **1.2** A Works Authorisation Deed with RMS will be obtained for the overpass of the Castlereagh Highway prior to construction works within the highway easement. **1.3** Prior to construction a CEMP will be prepared for the Springvale Coal Services Site that will be implemented during the construction phase and will include: ❒ Noise Management Plan; ❒ Air Quality Management Plan; ❒ Site Water Management Plan; ❒ Groundwater Management Plan; ❒ Cultural Heritage Management Plan; ❒ Weed Management Plan; and ❒ Construction Traffic Management Plan.

EIS Table 67 - Project Operation - Statement of Commitments

Desired Outcome	Action
1.General	
All operations are undertaken in a manner that will minimise the environmental impacts associated with the Project.	**1.1** Operations will be undertaken generally in accordance with the description provided in this EIS dated April 2013.
2. Hours of Operation	
All operations are undertaken within the approved operating hours.	**2.1** Operations may be undertaken 24 hours a day 7 days a week.
3. Noise and Vibration	
All noise impacts are minimised to the greatest extent possible.	**3.1** Removal of the northern two thirds of the existing Co-Disposal REA at the Springvale Coal Services Site within five years of Project Approval. **3.2** The construction of the Link Haul Road in the location as depicted in Figure 1 of the EIS. **3.3** Material haulage will be managed to maintain compliance with the approved noise criteria on the private Haul Roads. **3.4** Reduction of truck movements along Mt Piper Haul Road during prevailing noise enhancing weather conditions in order to meet the nominated Project Specific Noise Criteria. The default level will be zero trucking during these conditions until such time as noise monitoring confirms the truck movements required to meet the Project Specific Noise Criteria during these conditions. **3.5** Within 6 months of the date of the Project Approval, A Noise Management Plan will be prepared for the entire PAA. The plan will be prepared in consultation with the EPA. The Noise Management Plan will include the existing monitoring and mitigation strategies contained in the current approved Angus Place Noise Monitoring program, specifically,

Desired Outcome	Action
	quarterly inspections of road surfaces, quarterly attended and unattended monitoring to assess compliance and additional noise monitoring in response to noise complaints. The Noise Management Plan will include a protocol for determining the prevailing noise enhancing weather conditions which would trigger reduced transport on the Mt Piper Haul Road. **3.6** The following dust mitigation measures will be implemented and will be completed prior to operating the new infrastructure: ❒ Enclosure of the existing and proposed Washery; ❒ Enclosure of conveyor transfer points; ❒ Loading of coal rejects from an enclosed bin; ❒ Majority of coal reclaimed from stockpiles via underground reclaim tunnel; ❒ Three quarter enclosed conveyors; and ❒ New Link Haul Road will be fully sealed. **3.7** Location of infrastructure as per Figure 8 of the EIS.
4. Air Quality	
All air quality impacts are minimised to the greatest extent possible.	**4.1** The following dust mitigation measures will be implemented and will be completed prior to operating the new infrastructure: ❒ Enclosure of the existing and proposed Washery; ❒ Enclosure of conveyor transfer points; ❒ Loading of coal rejects from an enclosed bin; ❒ Majority of coal reclaimed from stockpiles via underground reclaim tunnel; ❒ Three quarter enclosed conveyors; ❒ Stockpile water sprays which are wind activated; ❒ New Link Haul Road will be fully sealed; ❒ Regular use of water carts on unsealed roads trafficked by heavy vehicles. This will include the surface of the proposed REA; and ❒ Installation of a TEOM continuous atmospheric dust monitoring unit within the Blackmans Flat residential area. **4.2** Within 6 months of the date of the Project Approval, an updated Air Quality Management Plan will be prepared for the entire PAA. The plan will be prepared in consultation with the EPA.
5. Surface Water, Groundwater, Geomorphology and Aquatic	
All surface water groundwater and aquatic impacts are minimised to the greatest extent possible.	**5.1** Within 6 months of Project Approval a single Water Management Plan will be prepared for the entire PAA and will include operation of the new infrastructure, water recycling system, surface and groundwater monitoring including Wangcol Creek mixing zone and a staged implementation of the separation of the Lamberts Gully drainage line as it passes through the Springvale Coal Services Site as well as the localised changes associated with approved Mt Piper Power Station Ash Emplacement Project. **5.2** Within 6 months of the date of the Project Approval apply for any necessary water licenses covering the Springvale Coal Services Site. **5.3** Within 5 years of the date of the Project Approval, complete the separation of clean and dirty water at the Springvale Coal Services Site. The design will include the diversion of upstream catchments of Huon Gully around the new REA. The sub-catchment containing the existing A Pit REA (previously the Lambert Gully upstream of the Springvale Coal Services Site Open Cut) as well as the new REA will be diverted into the New Sediment Dam. This sub-catchment currently discharges to Huon Gully without treatment and the staged bypass and therefore the proposed change will lead to improved water quality in Huon Gully. Following remediation of the new REA, this sub-catchment of Huon Gully

Desired Outcome	Action
	will be restored. **5.4** Construct a staged bypass of the Conveyor Dam and Retention Pond on the Springvale Coal Services Site within 3 years of the date of the consent. **5.5** Construct a pollution control pond control runoff from the new REA. This structure will have a capacity of approximately 15 ML and will be located on the north-eastern corner of the REA. The dam will have a pipe connection to the existing Washery Dam, which is connected to Cooks Dam via a pipeline. This will enable treated stormwater from the new REA to be recycled back to the Washery via Cooks Dam. This dam is to be constructed once the current A Pit REA is completed but prior to the base of the new REA being completed. **5.6** Provision of a belt press filter system (or equivalent) to recover water from the tailings produced from the new Washery. This water recovery system will cover tailings produced from the existing Washery but will be installed as part of the construction of the new Washery. **5.7** Apply for a separate EPL covering the entire PAA that includes LDP 003 (Kerosene Vale Stockpile Area) and LDP 006 and LDP 007 (conveyor at Duncan Street, Lidsdale). **5.8** Within 3 months of completion of the clean and dirty water separation system consent apply to relocate the current LDP006 to the spillway of Cooks Dam and replace the existing LDP006 with a license monitoring point. **5.9** Within 6 months of completion of the Link Haul Road, complete the additional riparian planting for a 100 m section of Wangcol Creek downstream of the Link Haul Road crossing. The species selection and density is to be determined in consultation with the WaterNSW and DPI Water. **5.10** Within 12 months of Project Approval, site specific trigger values based on ANZECC 2000 Guidelines will be developed for Wangcol Creek. **5.11** To better understand the groundwater linkages, within 12 months of Project Approval, a baseline groundwater monitoring program will be established for the Springvale Coal Services Site. The baseline groundwater monitoring program will include: ❒ Quarterly monitoring of water levels from a network of monitoring bores following the completion of construction; ❒ Six monthly sampling of monitoring bores for field analysis of pH, EC and temperature and laboratory analysis on major ions, pH, EC, TDS, dissolved arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel and zinc; and ❒ An annual review so that its capacity as an accurate predictive tool can be assessed and maintained.
6. Visual	
All visual impacts are minimised to the greatest extent possible.	**6.1** Prior to its completion, the battered slopes of the Link Haul Road overpass bridge will be planted with low maintenance hardy groundcover flowering species. **6.2** Staged rehabilitation of the REA will be in accordance with the timeframes provided within the EIS.
7. Aboriginal Heritage Management	
Ensure that identified and unidentified Aboriginal Sites are appropriately managed.	**7.1** Within six months of Project Approval, a CHMP will be prepared as part of the ongoing management of the Springvale Coal Services Site. The CHMP which will be developed in consultation with the Aboriginal Stakeholders.
8. Traffic Management	

Desired Outcome	Action
Project-related impacts on the road network are limited.	**8.1** The Link Haul Road will be constructed in accordance with AUSROADS Guidelines in consultation with RMS. **8.2** All construction sites associated with the infrastructure upgrade prepare and implement a Construction Traffic Management Plan. **8.3** Upgrade Springvale Coal Services intersection line-marking to RMS standards.
9. Contamination	
Potential contamination impacts are minimised to the greatest extent possible.	**9.1** A Phase 2 Assessment of the entire Springvale Coal Services Site will be conducted before February 2015, in accordance with Springvale Coal's stated commitments to the NSW EPA (letter dated 2 February 2012).
10. Rehabilitation	
Rehabilitation of the Springvale Coal Services Site is conducted in accordance with Industry Standards.	**10.1** Within six months of Project Approval a single Rehabilitation Plan will be prepared for the entire PAA in consultation with the Department and DPI and will include the timeframes provided within this EIS, details of the rehabilitation methods, monitoring and reporting framework. Results arising from the implementation of the program will be reported each year in the Annual Review (currently referred to as the AEMR). **10.2** The rehabilitation program will include previous commitments from the Lamberts Gully Project Approval (06-0017) including *Eucalyptus cannonii*.

Correspondence from the Department of Planning and Environment

APPENDIX – B

Planning Services
Resource Assessments

Contact: Paul Freeman
Phone: (02) 9274 6587
Email: paul.freeman@planning.nsw.gov.au

Mr James Wearne
Group Approvals Manager
Centennial Coal Limited
PO Box 1000
Toronto NSW 2283

Ref: SSD-5579

Dear Mr Wearne

Springvale Coal Services Project – SSD-5579 Proposed Modifications

I refer to your letters, dated 21st September 2016, requesting the Department's advice on the approval pathway for proposed modifications to the Springvale Coal Services Project.

The Department has carefully reviewed the information you provided and can confirm that Section 96(2) of the *Environmental Planning and Assessment Act 1979* is the applicable approval pathway for both proposed modifications.

The Department considers that the proposed assessment approaches detailed in your letters are reasonable.

However, the Department considers that the Modification 1 application should assess any changes to the rehabilitation strategy for the project, in addition to assessing the water impacts of the modification. The Modification 2 application should also consider traffic impacts.

You should ensure the level of environmental assessment is commensurate with the scale of the proposed modifications and the likely environmental impacts.

I would appreciate it if you could contact the Department at least 2 weeks before you intend to lodge the modification applications, to:

- confirm the applicable fees (in accordance with clause 245K of the *Environmental Planning and Assessment Regulation 2000*); and
- determine the public consultation process.

If you wish to discuss the matter further, please contact Paul Freeman on (02) 9274 6587.

Yours sincerely

11/10/16

Clay Preshaw
A/Director
Resource Assessments
(as nominee of the Secretary)

APPENDIX – C

Schedule of Lands

Western Coal Services Project SSD 5579 – Schedule of Lands	
Lot & DP	**Land Owner**
10//1187371	Centennial Fassifern Pty Limited
5//1187371	Centennial Fassifern Pty Limited
4//1187371	Centennial Fassifern Pty Limited
120//1188105	Centennial Fassifern Pty Limited
124//1188105	Centennial Fassifern Pty Limited
139//1185660	Centennial Fassifern Pty Limited
144//1185660	Centennial Fassifern Pty Limited
41//751636	Centennial Fassifern Pty Limited
2//260621	Centennial Fassifern Pty Limited
4//260621	Centennial Fassifern Pty Limited
9//1187371	Centennial Fassifern Pty Limited
1//1139982	Centennial Fassifern Pty Limited
4//1139982	Centennial Fassifern Pty Limited
1//386554	Centennial Fassifern Pty Limited
32//751636	Centennial Fassifern Pty Limited
351//751636	Centennial Fassifern Pty Limited
51//751651	Centennial Fassifern Pty Limited
57//751636	Centennial Fassifern Pty Limited
121//1188105	Centennial Fassifern Pty Limited
3//542432	Centennial Fassifern Pty Limited
1//872119	Centennial Springvale Pty Limited
3//1151441	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
4//1151441	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
1//1201852	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
2//1151441	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
20//14100	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
2//126483	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
2//835651	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
1//88503	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
357//751651	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
13//751651	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
501//825541	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited
1//126483	Centennial Springvale Pty Limited & Springvale SK Kores Pty Limited

Western Coal Services Project SSD 5579 – Schedule of Lands	
Lot & DP	**Land Owner**
1//825887	Coal>Link Pty Ltd
1//1049889	The City of Lithgow Council
42//751636	The City of Lithgow Council
67//751636	EnergyAustralia NSW Pty Ltd
140//1185660	EnergyAustralia NSW Pty Ltd
147//1185660	EnergyAustralia NSW Pty Ltd
149//1185660	EnergyAustralia NSW Pty Ltd
151//1185660	EnergyAustralia NSW Pty Ltd
1//803655	EnergyAustralia NSW Pty Ltd
191//629212	EnergyAustralia NSW Pty Ltd
2//702619	EnergyAustralia NSW Pty Ltd
15//804929	EnergyAustralia NSW Pty Ltd
9//804929	EnergyAustralia NSW Pty Ltd
1//702619	EnergyAustralia NSW Pty Ltd
11//1139978	EnergyAustralia NSW Pty Ltd
10//1139978	EnergyAustralia NSW Pty Ltd
1//1087684	EnergyAustralia NSW Pty Ltd
3//1139982	EnergyAustralia NSW Pty Ltd
3//829137	EnergyAustralia NSW Pty Ltd
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5//829137	EnergyAustralia NSW Pty Ltd
101//829410	EnergyAustralia NSW Pty Ltd
228//1131953	EnergyAustralia NSW Pty Ltd
2//1139982	EnergyAustralia NSW Pty Ltd
5//1087684	EnergyAustralia NSW Pty Ltd
152//1185660	EnergyAustralia NSW Pty Ltd
2//1018958	EnergyAustralia NSW Pty Ltd
103//1164619	EnergyAustralia NSW Pty Ltd
139//1188105	Enhance Place Pty Limited
140//1188105	Enhance Place Pty Limited
135//1188105	Enhance Place Pty Limited
132//1188105	Enhance Place Pty Limited

Western Coal Services Project SSD 5579 – Schedule of Lands	
Lot & DP	**Land Owner**
138//1188105	Enhance Place Pty Limited
141//1188105	Enhance Place Pty Limited
137//1188105	Enhance Place Pty Limited
375//751651	Ivanhoe Coal Pty Limited
16//751651	Ivanhoe Coal Pty Limited
385//751651	Ivanhoe Coal Pty Limited
174//751651	Ivanhoe Coal Pty Limited
2//567915	Ivanhoe Coal Pty Limited
101//1137972	Ivanhoe Coal Pty Limited
371//751651	Janette Winifred Hunt
128//1188105	Lidsdale Holdings Pty Limited
1//1127043	Lithgow City Council
8//252472	State Rail Authority Of New South Wales
1//252472	State Rail Authority Of New South Wales
502//825541	The State Of New South Wales
70//751636	The State Of New South Wales
7005//1026541	The State Of New South Wales
291//751636	The State Of New South Wales
290//751636	The State Of New South Wales

Noise Impact Assessment

APPENDIX – D

Western Coal Services Project

Noise Impact Assessment

July 2017

Prepared for

Springvale Coal Pty Limited

Global Acoustics

Noise and Vibration Analysis and Solutions

Global Acoustics Pty Ltd
PO Box 3115 | Thornton NSW 2322
Telephone +61 2 4966 4333
Email global@globalacoustics.com.au
ABN 94 094 985 734

Western Coal Services Project

Noise Impact Assessment
July 2017

Reference: 17100_R01
Report date: 23 August 2017

Prepared for

Centennial Coal Company Ltd
Castlereagh Highway
Blackmans Flat NSW 2790

Prepared by

Global Acoustics Pty Ltd
PO Box 3115
Thornton NSW 2322

Prepared:	Robert Kirwan Acoustic Engineer	QA Review:	Tony Welbourne Director

Global Acoustics Pty Ltd ~ Environmental noise modelling and impact assessment ~ Sound power testing ~ Noise control advice ~ Noise and vibration monitoring ~ OHS noise monitoring and advice ~ Expert evidence in Land and Environment and Compensation Courts ~ Architectural acoustics ~ Blasting assessments and monitoring ~ Noise management plans (NMP) ~ Sound level meter and noise logger sales and hire

EXECUTIVE SUMMARY

Global Acoustics Pty Ltd was engaged by Springvale Coal Pty Limited (Springvale Coal) to prepare an environmental noise impact assessment (NIA) for The Western Coal Services Project (WCS), located approximately 15 km north of Lithgow, NSW. This assessment considers operational, low frequency, road traffic and cumulative noise, and has been prepared to support a proposed modification to the WCS Consent SSD 5579 (WCS Consent) seeking a revision in the application of noise criteria to the Springvale Coal Services Site (SCSS) only.

Unmitigated SCSS model results indicate noise would exceed the relevant day, evening and night criterion at 22, 29 and 27 receptor locations respectively, out of the 168 sensitive receptors assessed. Springvale Coal has investigated and proposed to implement various noise mitigation measures at SCSS. Mitigated SCSS model results reduce the exceedance counts to 9, 5 and 7 receptor locations for the day, evening and night periods respectively. All of the mitigated predictions are within 2 dB of the WCS Consent criteria.

A cumulative assessment of the SCSS mitigated model results with existing predictions for Mt Piper Power Station operations indicated noise at all receptors meets the acceptable day period criterion of L_{Aeq} 55 dB and the acceptable evening period criterion of L_{Aeq} 45 dB. Noise at receptors B4 and B17 is predicted to exceed the acceptable night period criterion of L_{Aeq} 40 dB, however in the WCS Consent B17 has a criterion of L_{Aeq} 45 dB and B4 is acquisition upon request. Given this, no cumulative noise impact is predicted.

An assessment of low frequency noise (LFN) in general accordance with the draft Industrial Noise Guideline (dING)of SCSS mitigated results was undertaken for all receivers, across all time periods. Predictions for B17 triggered a 2dB penalty during the evening and night periods, however, even with this penalty applied, evening and night results were less than the current WCS Consent criterion.

Springvale Coal is proposing regulation of the private haul roads, Kerosene Vale Stockpile Area and overland conveyor system via operational constraints. Recommended mitigation measures and a sequence of their implementation is detailed for SCSS. Monitoring and validation modelling should be undertaken after each stage to determine the noise level reductions achieved and evaluate if further implementation is required. Additionally, any modification to the WCS Consent would require Springvale Coal to complete a review of the WCS Noise Management Plan and if required, submit a revised document for regulator approval.

Global Acoustics Pty Ltd

Table of Contents

Appendices

1 INTRODUCTION

Global Acoustics Pty Ltd was engaged by Springvale Coal Pty Limited (Springvale Coal) to prepare an environmental noise impact assessment (NIA) for The Western Coal Services Project (WCS), located approximately 18 km north of Lithgow, NSW. The Springvale Coal Services Site (SCSS) is the largest land component of the Project Application Area, and is located off the Castlereagh Highway at Blackmans Flat.

Approval for the Western Coal Services Project was granted by the Planning Assessment Commission (under delegation from the Minister for Planning) on 4 April 2014. This environmental noise assessment and has been prepared to support a proposed modification to the WCS Consent SSD 5579 (WCS Consent) seeking a revision in the application of noise criteria to the SCSS only.

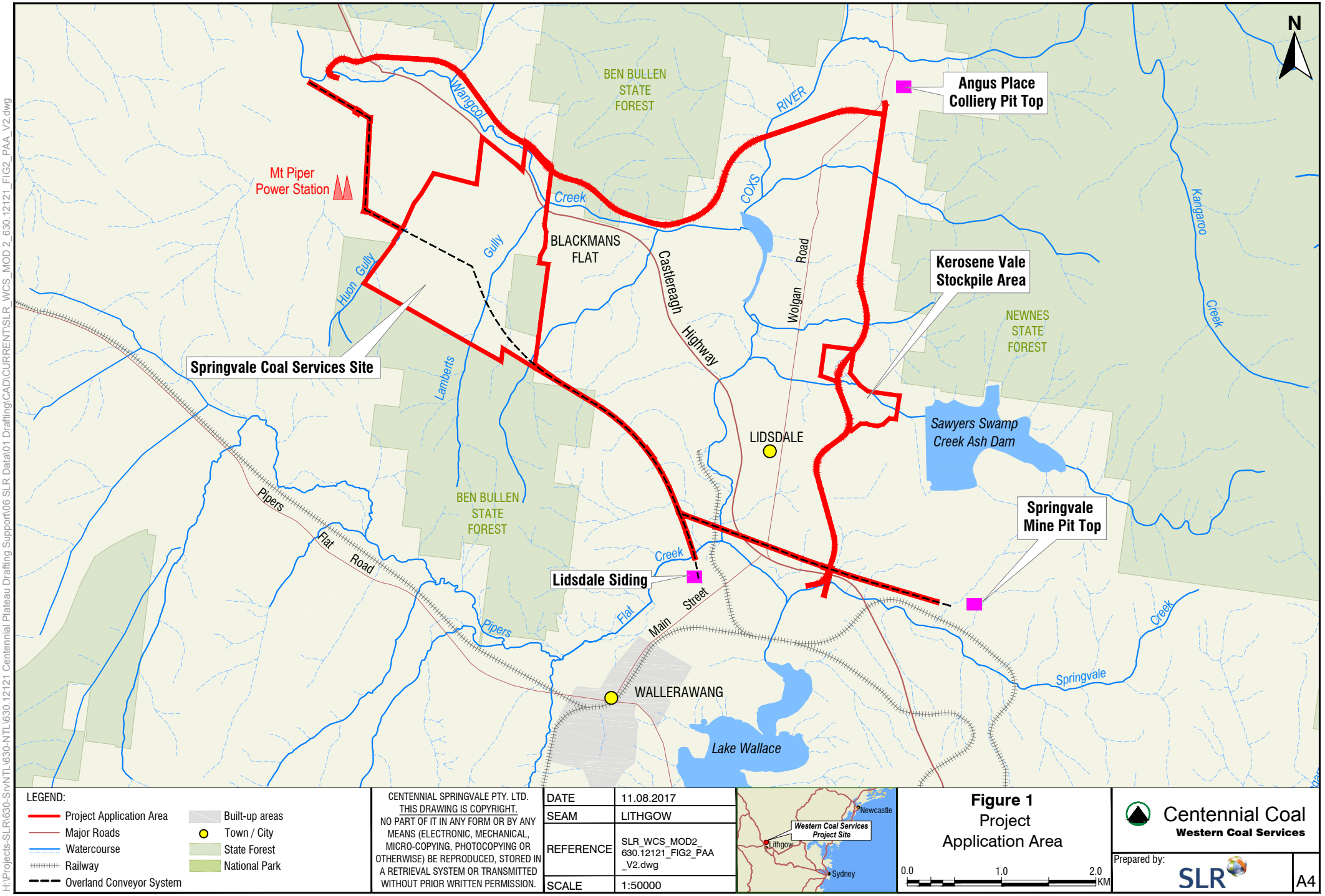
The primary objectives of this environmental noise assessment are to quantify potential noise impacts. This assessment considers operational, low frequency, road traffic and cumulative noise. As part of the assessment, reasonable and feasible mitigation measures have been proposed for fixed and mobile plant with the aim of meeting WCS Consent noise criteria at SCSS. The assessment also proposes mitigation measures for the overland conveyor system at Lidsdale and operational management of coal haulage on private haul roads to reasonably reduce noise emissions on the environment.

Figure 1 shows the Western Coal Services Project Application Area and other Centennial operations in the region. Figure 2 shows SCSS infrastructure.

1.1 Receptor Locations

168 receptors were considered in this assessment and include the sensitive receptors for other nearby Centennial operations with the potential to be impacted by the WCS operations. Private residence locations and coordinates are provided in Appendix A and shown in Figures 3 and 4. Figure 3 shows sensitive receptor locations in Lidsdale (part), Wallerawang and in the vicinity of Springvale Mine pit top. Figure 4 shows nearest receptor locations in Blackmans Flat, Lidsdale (part) and in the vicinity of Angus Place pit top. Of the 168 sensitive receptors assessed:

- 50 receptors are located in Blackmans Flat with labels B04 (acquisition on request on SSD 5579), B12 – B60;
- 102 receptors are located in Lidsdale with labels S3, L01 – L101;
- 10 receptors are located in Wallerawang with labels R01 (acquisition on request on Lidsdale Siding Project Approval PA 08_0223), R02 – R04, R07 – R12;
- 4 receptors are located in the vicinity of Springvale Mine pit top with labels S1, S2, S4, S5; and
- 2 receptors are located on Wolgan Road in the vicinity of Angus Place pit top with labels WR1 and WR2.


N
Angus Place Colliery Pit Top
Mt Piper Power Station
Springvale Coal Services Site
Kerosene Vale Stockpile Area
Springvale Mine Pit Top
Lidsdale Siding
BEN BULLEN STATE FOREST
NEWNES STATE FOREST
BLACKMANS FLAT
LIDSDALE
WALLERAWANG
Sawyers Swamp Creek Ash Dam
Lake Wallace
Castlereagh Highway
Wolgan Road
Pipers Flat Road
Main Street
Wangcol Creek
COXS RIVER
Huon Gully
Gully
Lamberts Gully
Kangaroo Creek
Springvale Creek
Flat Creek
Pipers Flat
LEGEND:
Project Application Area
Major Roads
Watercourse
Railway
Overland Conveyor System
Built-up areas
Town / City
State Forest
National Park
CENTENNIAL SPRINGVALE PTY. LTD.
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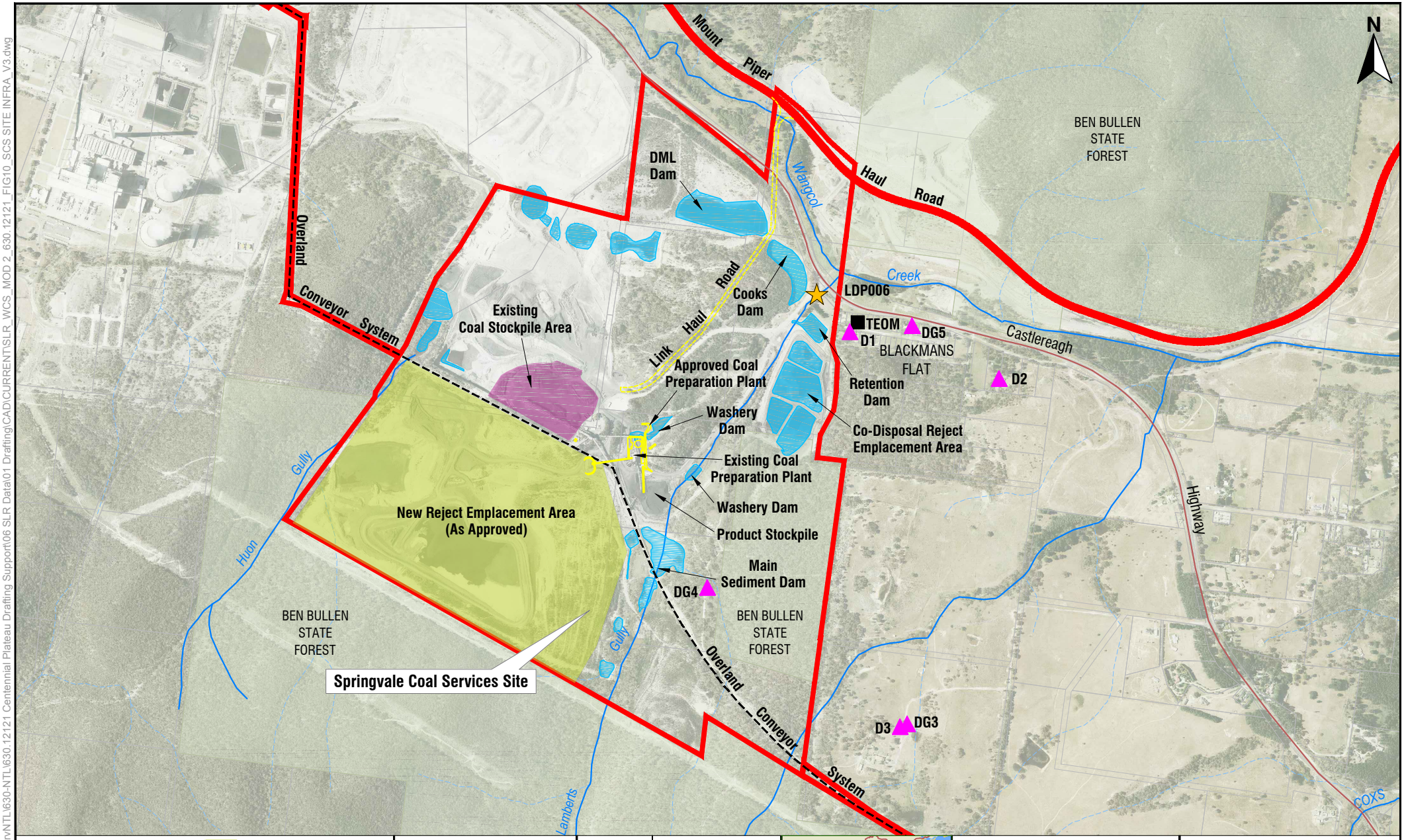
DATE 11.08.2017
SEAM LITHGOW
REFERENCE SLR_WCS_MOD2_630.12121_FIG2_PAA_V2.dwg
SCALE 1:50000
Newcastle
Western Coal Services Project Site
Lithgow
Sydney
Figure 1
Project Application Area
0.0 1.0 2.0 KM
Centennial Coal
Western Coal Services
Prepared by:
SLR
A4
H:\Projects-SLR\630-SrvNTL\630-NTL\630.12121 Centennial Plateau Drafting Support\06 SLR Data\01 Drafting\CAD\CURRENT\SLR_WCS_MOD 2_630.12121_FIG2_PAA_V2.dwg



LEGEND:
- Project Application Area
- Major Roads
- Watercourse
- Overland Conveyor System
- State Forest
- Coal Stockpile Area
- New Reject Emplacement Area (as approved)
- Water Management Structures
- New Infrastructure
- Licensed Discharge Point
- Dust Deposition Gauge
- TEOM

DATE	11.08.2017
SEAM	LITHGOW
REFERENCE	SLR_WCS_MOD 2_630.12121_FIG10_ SCS SITE INFRA_V2.dwg
SCALE	1:17500

Figure 2
Springvale Coal Services Site Infrastructure

0 300 600 M

Centennial Coal
Western Coal Services

Prepared by: SLR

A4

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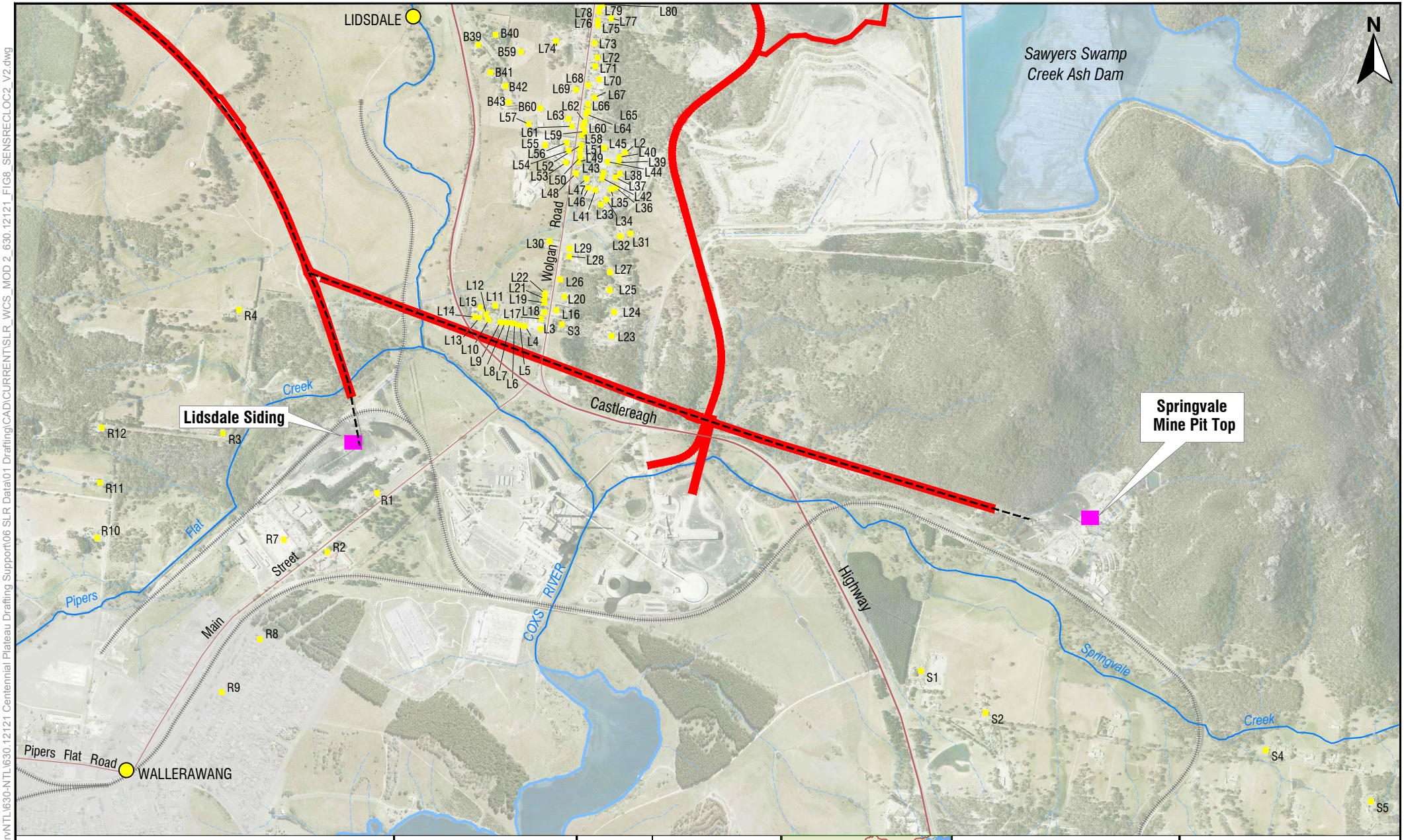

LEGEND:

- Project Application Area
- Major Roads
- Watercourse
- Railway
- Overland Conveyor System
- Built-up areas
- Town / City
- Receptor

DATE	11.08.2017
SEAM	LITHGOW
REFERENCE	SLR_WCS_MOD 2_630.12121_FIG8_ SENSRECLOC2_V1.dwg
SCALE	1:20000

Figure 3
Sensitive Receptor Locations 1

0 300 600 M

Centennial Coal
Western Coal Services

Prepared by: SLR

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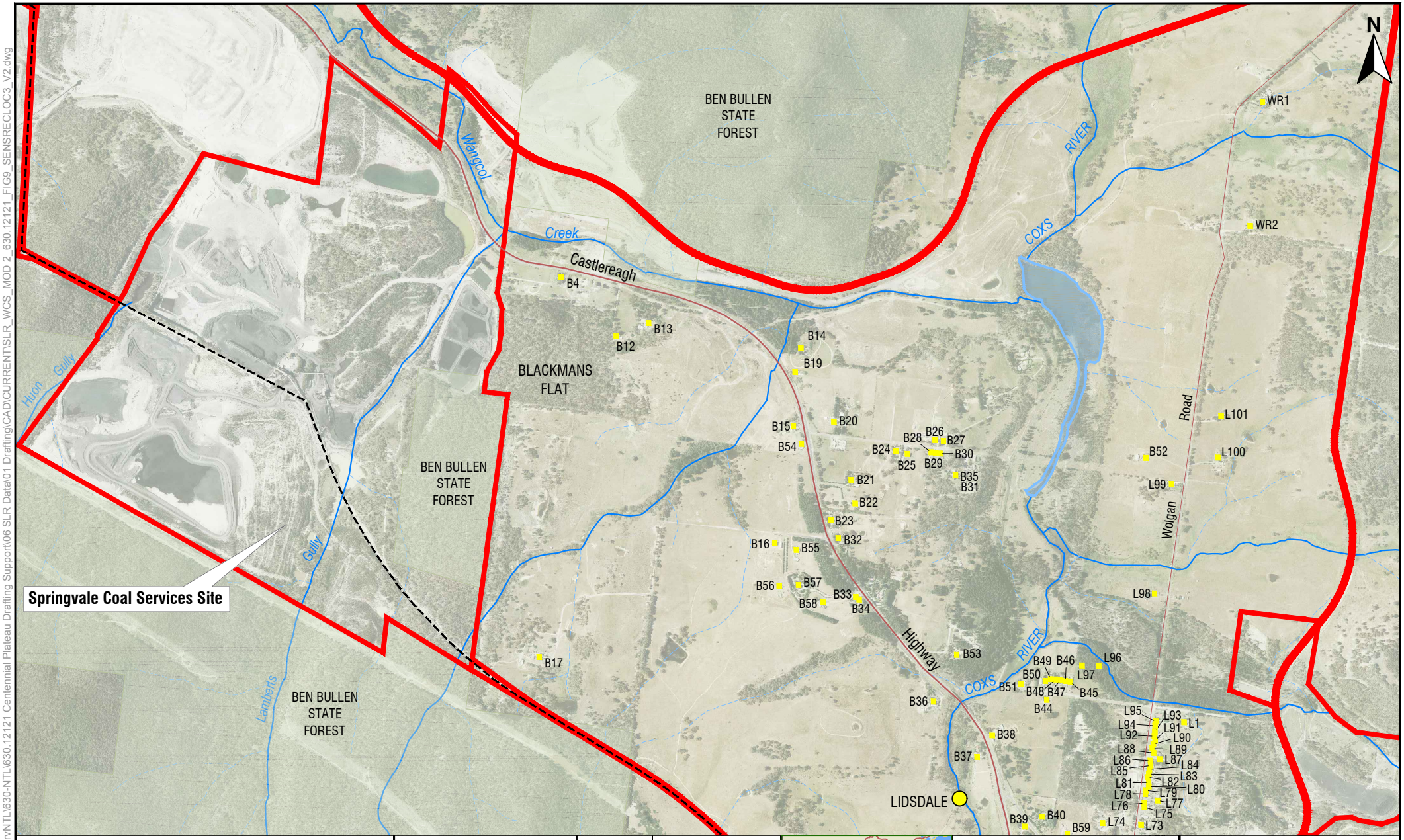


LEGEND:

- Project Application Area
- Major Roads
- Watercourse
- Railway
- Overland Conveyor System
- Built-up areas
- State Forest
- Town / City
- Receptor

DATE	11.08.2017
SEAM	LITHGOW
REFERENCE	SLR_WCS_MOD 2_630.12121_FIG9_ SENSRECLOC3_V1.dwg
SCALE	1:20000

Figure 4

Sensitive Receptor Locations 2

0 300 600 M

Centennial Coal
Western Coal Services

Prepared by: SLR

A4

H:\Projects-SLR\630-SrvNTL\630-NTL\630.12121 Centennial Plateau Drafting Support\06 SLR Data\01 Drafting\CAD\CURRENT\SLR_WCS_MOD 2_630.12121_FIG9_SENSRECLOC3_V2.dwg

1.2 Historical Operations

Open cut mining operations within the SCSS commenced in 1940, extracting coal from the Lidsdale and Lithgow seams. Underground operations commenced in 1942 with the Western Main underground entries located opposite the existing washery or the Coal Preparation Plant, and the Eastern Main Mine being where the current co-disposal reject emplacement area is located, near the main entrance to the SCSS. The previous underground workings mined the Lithgow seam until the 1990s. Between 1980 and 1994, three separate open cuts were developed which extracted the remaining coal south of the Castlereagh Highway, from Mount Piper Power Station to the SCSS entrance. The Lamberts Gully open cut mine was operational from 1994 to 2010 and extracted coal from both north and south of the overland conveyor.

Springvale Coal purchased the SCSS in October 1994 from Novacoal, who, under a 1992 development consent (DA 11/92) relating to the main Springvale Mine, constructed the overland conveyors, coal stockpile facilities and reject disposal facilities. The washery was built in the early 1970s for processing export steaming coal that was trucked across the Castlereagh Highway to the Wallerawang Rail Siding (now dismantled and part of the Pine Dale Mine site). This washery was upgraded in 1995.

Springvale Mine, an underground operation, was approved in 1992 and developed in 1995 to supply coal to Mt Piper Power Station by overland conveyor via the old Western Main site – now referred to as the SCSS. Springvale Mine's 1992 consent included the ability to process coal for export via the same overland conveyor to Lidsdale Siding. A subsequent modification to the original 1992 development consent (DA 11/92) allowed the construction of a short conveyor link to Wallerawang Power Station. Springvale Mine currently operates under a new State significant consent SSD 5594 which allows the mine to carry out mining operations until 31 December 2028. Run-of-mine (ROM) coal from Springvale Mine pit top is transported to the SCSS and Mt Piper Power Station using an overland conveyor system under the WCS Consent.

Angus Place Colliery is an underground mining operation that commenced operations in 1979. It received a contemporary Part 3A approval in 2006 (PA 06_0021) to extend mining operations. The mine has been under care and maintenance since March 2015. When in operation it mines coal from the Lithgow seam to supply Wallerawang (currently being decommissioned) and Mt Piper Power Stations. ROM coal from Angus Place Colliery is approved to be transferred to the power stations using two private haul roads, the Wallerawang and the Mount Piper Haul Roads under the WCS Consent

The WCS consent provides for the transport and the processing of ROM coal of up to a total of 9.5 Mtpa from Springvale Mine (4.5 Mtpa), Angus Place Colliery (4.0 Mtpa) and other Centennial Coal sources (1 Mtpa). It also provides for the transport of up to 6.7 Mtpa of ROM coal to the domestic power stations and transfer of up to 6.3 Mtpa of product coal to Lidsdale Siding (PA 08_0223) for the export market.

1.3 WCS Operations

WCS operations are comprised of four discrete project components:

- the Springvale Coal Services site (SCSS);
- Mt Piper haul road;
- Wallerawang haul road and the Kerosene Vale Coal Stockpile Area; and
- the overland conveyor system traversing from the Springvale Mine pit top to Mt Piper Power Station (see Figure 5) split into five sections with labels OL1 – OL5.

WCS operations are approved to operate 24 hours, seven days per week except:

- no truck movements for coal transportation on Wallerawang Haul Road can take place during the night period;
- no truck movements for coal transportation on Mount Piper Haul Road can take place during adverse meteorological conditions during the night period; and
- Kerosene Vale Coal Stockpile Area operations can only take place during the day period.

1.3.1 Springvale Coal Services Site

The SCSS consists of an existing coal preparation plant (CPP) of 2 Mtpa capacity, coal stockpiles, emplacement facilities for coarse and fine reject materials (tailings), and a coal distribution network of conveyors. The OL2 (part) and OL3 sections of the overland conveyor system also traverse the SCSS. A new CPP with a 5 Mtpa capacity is approved but has not yet been constructed, however has been assessed as a future potential noise source.

The CPP, conveyors and mobile plant (loaders, dozers and haul trucks) operating at SCSS are noise sources with the potential to impact sensitive receptors in Blackmans Flat.

1.3.2 Wallerawang Haul Road and Kerosene Vale Stockpile Area

The Wallerawang haul road is used for traversing between Angus Place Colliery, Kerosene Vale Stockpile Area and Wallerawang Power Station. Haul trucks and loaders are noise sources with the potential to impact sensitive receptors on Wolgan Road and parts of Lidsdale. Due to Angus Place Colliery being on care and maintenance, there is currently no haulage occurring on this haul road, or loaders operating at Kerosene Vale Stockpile Area. Springvale Coal is currently undertaking a feasibility study investigating alternative surface and underground coal clearance options for when Angus Place Colliery re-commences mining under their current project approval.

1.3.3 Mt Piper Haul Road

The Mt Piper haul road is used for traversing between Angus Place Colliery and Mt Piper Power Station. A private haul road linking SCSS to Mount Piper Haul Road is approved but not yet constructed. Haul trucks are a noise source with the potential to impact sensitive receptors on Wolgan Road and Blackmans Flat. Due to Angus Place Colliery being on care and maintenance, there is currently no haulage occurring on this haul road.

1.3.4 Overland Conveyor System

The overland conveyor system links the Springvale Coal Services site, Lidsdale Siding, Springvale Mine, Mt Piper and Wallerawang Power stations. The operation of the overland conveyor has the potential to impact on a number of sensitive receptors in Lidsdale, Wallerawang, Springvale and Blackmans Flat.

1.4 Noise Environment

WCS operations (SCSS, Mt Piper haul road) and the Mt Piper Power Station contribute to the noise environment in Blackmans Flat. Historically at Lidsdale, the contributing noise sources have been Lidsdale Siding operations, Wallerawang Power Station, Wallerawang haul road and the overland conveyor system. Both the overland conveyor system and SCSS have existed for over 20 years and were constructed to facilitate Springvale Mine operations. Wallerawang Power Station was decommissioned in November 2014, however existed for over 50 years before then. It should be noted that the haul roads, overland conveyor system, Wallerawang and Mt Piper Power Stations, Lidsdale Siding, Springvale Mine and Angus Place Colliery all existed, were operational and, were a part of the local noise environment at the time of the WCS development application in 2013.

1.4.1 Historical Attended Monitoring Data 2007-2008

Review of past monitoring data for other operations has provided further understanding of noise levels on the surrounding communities from the private haul roads and overland conveyors prior to the SLR report (2013) and grant of the WCS Consent in 2014. This data is presented in Table 1.1.

Table 1.1: HISTORICAL NOISE MONITORING DATA

Receptor	Monitoring Date	Period	Noise Level L_{Aeq} dB	Notes – Noise Source	Reference
R4	29/05/2008	Day	49-50	Overland conveyor	Lidsdale Siding Upgrade Project, Hatch 2012
B17	04/09/2007 23/09/2008	Day Day	44-45 44-46	Overland conveyor	Springvale Lamberts Gully Mine Attended Monitoring Data – Metford Labs
L8 (Duncan St)	29/05/2008	Evening	48 (L_{A90})	Overland conveyor and Wallerawang Power Station (specific contributions unknown)	Lidsdale Siding Upgrade Project, Hatch 2012
L27	20/07/2007	Day	46-49, max 58	Haul trucks on Wallerawang Haul Road	Stage 2 Kerosene Vale Ash Repository, Technical Report 5, Noise and Vibration – Parsons Brinckerhoff, 2008
L32	01/08/2007	Night	39-41, max 50	Haul trucks on Wallerawang Haul Road	Stage 2 Kerosene Vale Ash Repository, Technical Report 5, Noise and Vibration – Parsons Brinckerhoff, 2008
L82	02/08/2007	Night	45	Haul trucks on Wallerawang Haul Road	Stage 2 Kerosene Vale Ash Repository, Technical Report 5, Noise and Vibration – Parsons Brinckerhoff, 2008

1.4.2 SLR Attended Monitoring Data 2010-2013

SLR conducted quarterly attended monitoring for Springvale Coal Mine between 2010 and 2013. Overland conveyor noise levels were quantified in these reports at receptor S3 and have been presented in Table 1.2.

Table 1.2: SLR NOISE MONITORING DATA

Receptor	Monitoring Date	Period	Overland Conveyor Noise Level L_{Aeq} dB
S3[1] (location 3)	14/12/2010	Evening	43 to 44
	06/09/2012	Night	42
	11/03/2013	Evening	46 to 47
	25/06/2013	Evening	46
	25/06/2013	Night	44 to 46
	24/09/2013	Evening	46
	24/09/2013	Night	47
	12/12/2013	Day	44
	12/12/2013	Night	44

Notes: 1. Receptor S3 is listed as location 3 in the SLR monitoring reports.

1.4.3 WCS Attended Monitoring Data 2014 – present

Global Acoustics has conducted monthly attended monitoring for Western Coal Services since 2014. A selection of measurements where noise levels were above WCS Consent criteria at locations NM1, NM4 and NM6 are presented in Table 1.3.

Table 1.3: GLOBAL ACOUSTICS NOISE MONITORING DATA

Monitoring Location ID	Representative Receptors	Monitoring Date	Period	WCS Noise Level L_{Aeq} dB	Notes – Noise Source
NM1	B12, B13	23/06/2015	Evening	39	CPP continuum
		19/10/2016	Evening	39	CPP continuum
		15/11/2016	Evening	38	CPP continuum
		5/9/2016	Night	41	CPP continuum
		15/11/2016	Night	41	CPP continuum
NM4	B16	30/7/2014	Evening	40	CPP continuum and haul trucks
		30/7/2014	Night	40	CPP continuum and haul trucks
		15/10/2014	Evening	39	CPP continuum and haul trucks
		16/10/2014	Night	44	CPP continuum, overland conveyors and haul trucks
		16/8/2016	Evening	41	Overland conveyors
		15/11/2016	Evening	39	CPP continuum and overland conveyors
NM6	S3	10/3/2016	Day	44	Overland conveyors
		17/5/2016	Day	47	Overland conveyors
		27/4/2015	Evening	48	Overland conveyors
		10/3/2016	Evening	46	Overland conveyors
		13/1/2016	Night	45	Overland conveyors
		10/3/2016	Night	46	Overland conveyors

Historical conveyor levels at S3 in Duncan Street are consistent with recent attended monitoring data from Global Acoustics and well above the day (L_{Aeq} = 36 dB), evening (L_{Aeq} = 36 dB) and night (L_{Aeq} = 39 dB) noise criteria in the WCS consent for this receptor.

Background noise levels at S3 in SLR report (2013) were also up to L_{A90} 54 dB, attributable (although not quantified) to a likely combination of Wallerawang Power Station and the overland conveyors. These observations confirm that historically the area in the vicinity of S3 in Lidsdale has been subject to background noise levels above WCS Consent criterion at night.

2 CRITERIA

2.1 WCS Noise Criteria

The WCS project was granted consent State Significant Development Consent SSD 5579 by the NSW Planning Assessment Commission as delegate of the then Minister for Planning and Infrastructure on 04 April 2014. Table 3 within Condition 7 of Schedule 3 of the WCS consent SSD 5579 lists noise criteria applicable for residences on privately owned land. The content of that table is reproduced below.

Table 2.1: WCS NOISE CRITERIA dB

Receptor	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
B12	40	35	35	47
B13	41	36	36	50
B14	41	35	35	55
B15	36	35	35	45
B16	35	35	36	45
B17	42	44	45	45
R3	35	35	36	45
R4	37	37	41	45
L1	42	35	35	45
L2	40	39	35	45
WR1	41	38	36	57
WR2	38	37	35	48
S3	36	36	39	45
All other privately owned residences	35	35	35	45

2.2 Low Frequency Noise Criteria

An assessment of low frequency noise (LFN) in general accordance with the draft Industrial Noise Guideline (dING) (EPA, 2015) was undertaken considering all receivers, across the operational scenarios assessed, across all time periods. Receivers with predicted C minus A results greater than or equal to 15 dB were assessed against the dING third octave thresholds using a typical received spectrum for SCSS. The total C-weighted level of the maximum allowable received spectrum was adopted as the limiting criterion and used to assess total C-weighted level predictions.

Receivers with A-weighted predictions less than or equal to $L_{Aeq,15minute}$ 30 dB were excluded, as application of a modifying factor penalty would not result in exceedance of any criterion, and both A-weighted and C-weighted predictions are low level in these cases. Results are presented in Section 5.2

2.3 Cumulative Noise Criteria

The Industrial Noise Policy (INP) (EPA, 2000) recommends acceptable amenity criteria for various land uses. Urban areas, as defined by the INP, are dominated by industrial noise and have through traffic with characteristically heavy and continuous traffic flows during peak periods. Suburban areas have limited industry and decreasing noise levels in the evening period. Based on this, suburban amenity criteria has been determined to be applicable for the day, evening and night periods. Table 2.2 presents the amenity criteria.

Table 2.2: AMENITY NOISE CRITERIA dB

Receptor	Day $L_{Aeq,period}$ Acceptable/Maximum	Evening $L_{Aeq,period}$ Acceptable/Maximum	Night $L_{Aeq,period}$ Acceptable/Maximum
Privately owned residences	55/60	45/50	40/45

2.4 Road Traffic Noise Impacts

The NSW Road Noise Policy (RNP) (DECCW 2011) is applicable to road traffic noise generated by WCS. ARC Traffic and Transport have undertaken a traffic impact assessment for WCS, which indicates 7 additional vehicle trips per day would occur during AM and PM peak periods. Based on this, the increase on the Castlereagh Highway would be minor and the resulting road traffic noise impact would be negligible. Road traffic has not been considered further in this report.

3 METHODOLOGY

3.1 Noise Modelling Assessment

Noise levels were predicted using RTA Technology's Environmental Noise Model (ENM), a computer based environmental noise model, to determine the acoustic impact of mining activities. The model takes into account geometric spreading, atmospheric absorption, and, barrier and ground attenuation. ENM Terrain Category 2, representing a rural land environment, was adopted for model input.

The cumulative distribution methodology involves undertaking calculation for a comprehensive range of temperature gradients, wind speeds and wind directions. A data set consisting of 195 combinations of meteorological parameters (wind speed, wind direction and vertical temperature gradient) was modelled. These results provide an indication of likely impact under all possible atmospheric conditions. Results were determined for atmospheric conditions pertinent to the season under consideration.

This calculation methodology provides a range of results whereas a single value is required for comparison with the limiting criterion. It is considered appropriate to use the 90th percentile result (10 percent of results are higher than this number) to represent intrusive noise impact.

The cumulative distribution methodology differs from that used in the SLR NIA (2013), which used the prevailing meteorological method as outlined in the INP. The cumulative distribution method is a more comprehensive approach, has been considered appropriate by the EPA, and, been used previously in major noise impact assessments, for example for the Bulga Optimisation Project (Global Acoustics, 2013).

3.2 INP Modifying Factors

Section 4 of the INP requires consideration of modifying factors. These are characteristics of noise received at receptor locations that could result in more annoyance than would normally occur from that level. The modifying factors are tonal noise, low frequency noise, impulsive noise, intermittent noise and duration (if single event).

Environmental noise monitoring undertaken around WCS by Global Acoustics over the past 3 years has shown that of these factors, only low frequency noise is likely. Only low frequency noise has been considered in this assessment.

3.3 Cumulative Impact Assessment

The following Mt Piper Power Station operations were considered in the determination of existing industrial noise levels:

1) Mount Piper Power Station;

   a) Extension;

   b) Ash Emplacement Project; and

   c) Western Rail Coal Unloader.

The results were extracted from each project's noise impact assessment. The worst-case combined result over the life of the project was conservatively used. Estimates were made for receptors that were not assessed in each project's noise impact assessment.

Other operations such as Lidsdale Siding and Angus Place Colliery were not considered in the cumulative impact assessment, as they are geographically located at sufficient distance from SCSS, and directionally such that during periods of noise enhancement from SCSS, cumulative noise impact from Lidsdale Siding and Angus Place Colliery is not considered possible.

Estimated period industrial noise levels are based on model predictions determined for assessment of intrusive noise. These predictions are for a potential worst-case 15-minute period, for each period in the worst-case season. Cumulative noise (amenity) criteria are period based, that is, assessment noise levels are averaged over the entire time period rather than a single 15 minute interval; therefore it is common practice to make an adjustment from predicted $L_{Aeq,15minute}$ levels to obtain assessment $L_{Aeq,period}$ levels. An adjustment of minus 2 dB has been made to convert model predictions from $L_{Aeq,15minute}$ to $L_{Aeq,period}$ levels.

3.4 Sleep Disturbance

The proposed mitigation measures restrict the dozer from operating during the night period. There are no other plant items operating at night that are expected to generate noise that stands out above the general mining continuum. Given this, the potential for sleep disturbance from SCSS is unlikely. Sleep disturbance has not been assessed further in this report.

4 NOISE MODEL PARAMETERS

4.1 Meteorology

Meteorological data between September 2011 and January 2014 from the Bureau of Meteorology Bathurst AWS weather station was analysed to determine the frequency of occurrence of each of the modelled meteorological conditions, by season and time period. This station complies with AS 2923:1987, *Ambient Air – Guide for measurement of horizontal wind for air quality applications*.

Appendix C lists the 195 meteorological conditions included in the assessment.

4.2 Operational Scenarios and Model Assumptions

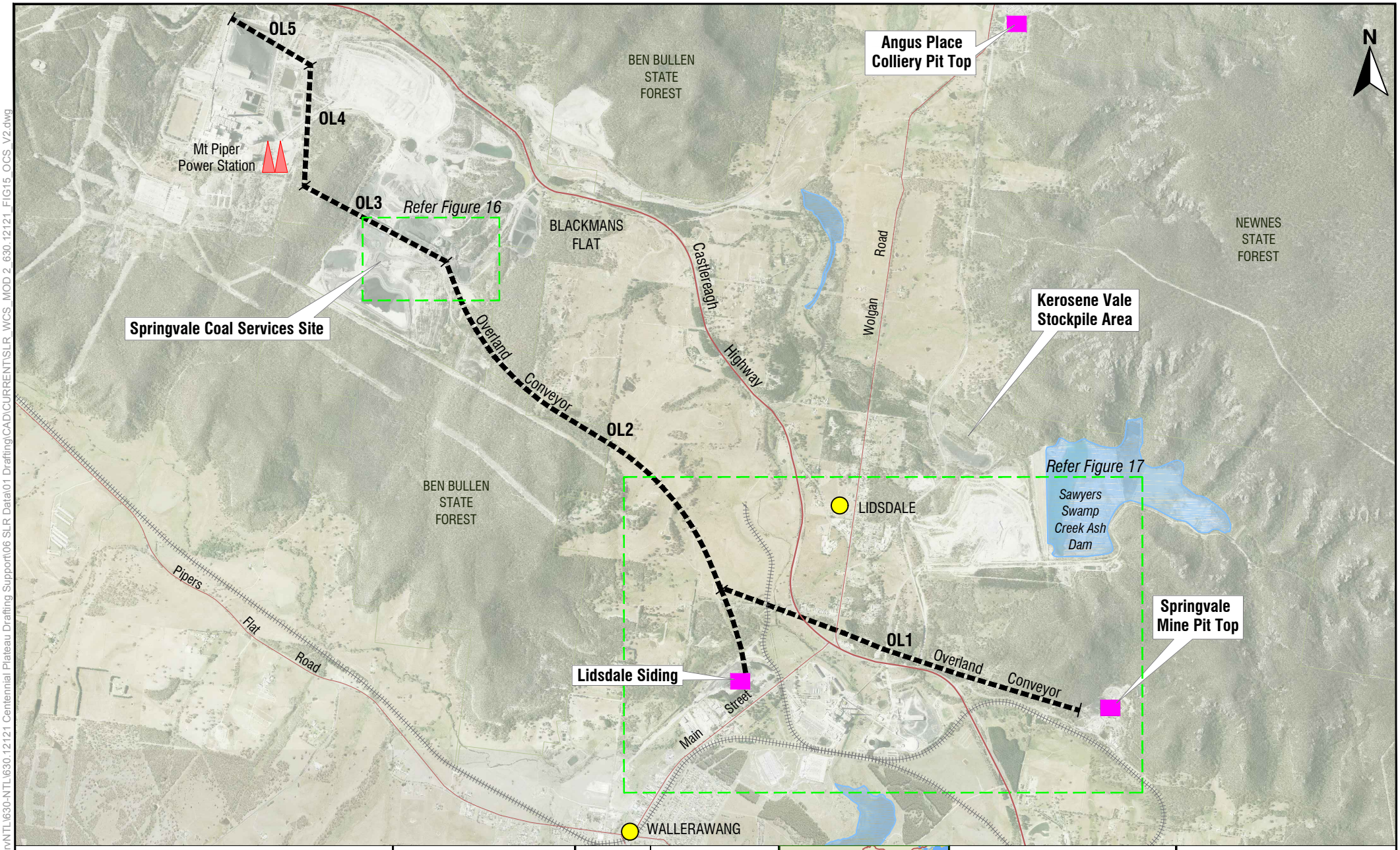
The SLR NIA (2013) considered all four WCS operational components described in Section 1.3. In this NIA, only SCSS operations have been modelled to support a recommendation discussed further in Sections 6 and 8 to restrict the WCS Consent noise criteria to the SCSS and to preclude their application to the other project components, namely the overland conveyor system, Mt Piper haul road, Wallerawang haul road and Kerosene Vale Stockpile Area.

Springvale Coal has investigated a range of noise controls for SCSS, both for fixed and mobile plant. The mitigation measures modelled are as follows:

- cladding on the new CPP building;
- upgraded cladding on the existing CPP building;
- low noise idlers on CW01, CW02 and OL2/OL3 conveyors;
- a barrier surrounding the western side of the OL3 conveyor drive;
- an attenuated dozer operating in the day period only; and
- an attenuated loader operating in the day and night periods only.

Figure 5 shows the entire overland conveyor system. Figure 6 shows the proposed location of low noise conveyor idlers at SCSS. Figure 7 shows the proposed location of low noise conveyor idlers on the overland conveyor system.

The modelled mitigation measures are discussed further in Section 6.



LEGEND:

- Project Application Area
- Major Roads
- Railway
- Overland Conveyor System
- Town / City

DATE	11.08.2017
SEAM	LITHGOW
REFERENCE	SLR_WCS_MOD 2_630.11495_FIG15_OCS_V2.dwg
SCALE	1:40000

Figure 5
Overland
Conveyor System

0.0 0.75 1.5 KM

Centennial Coal
Western Coal Services

Prepared by: SLR

A4

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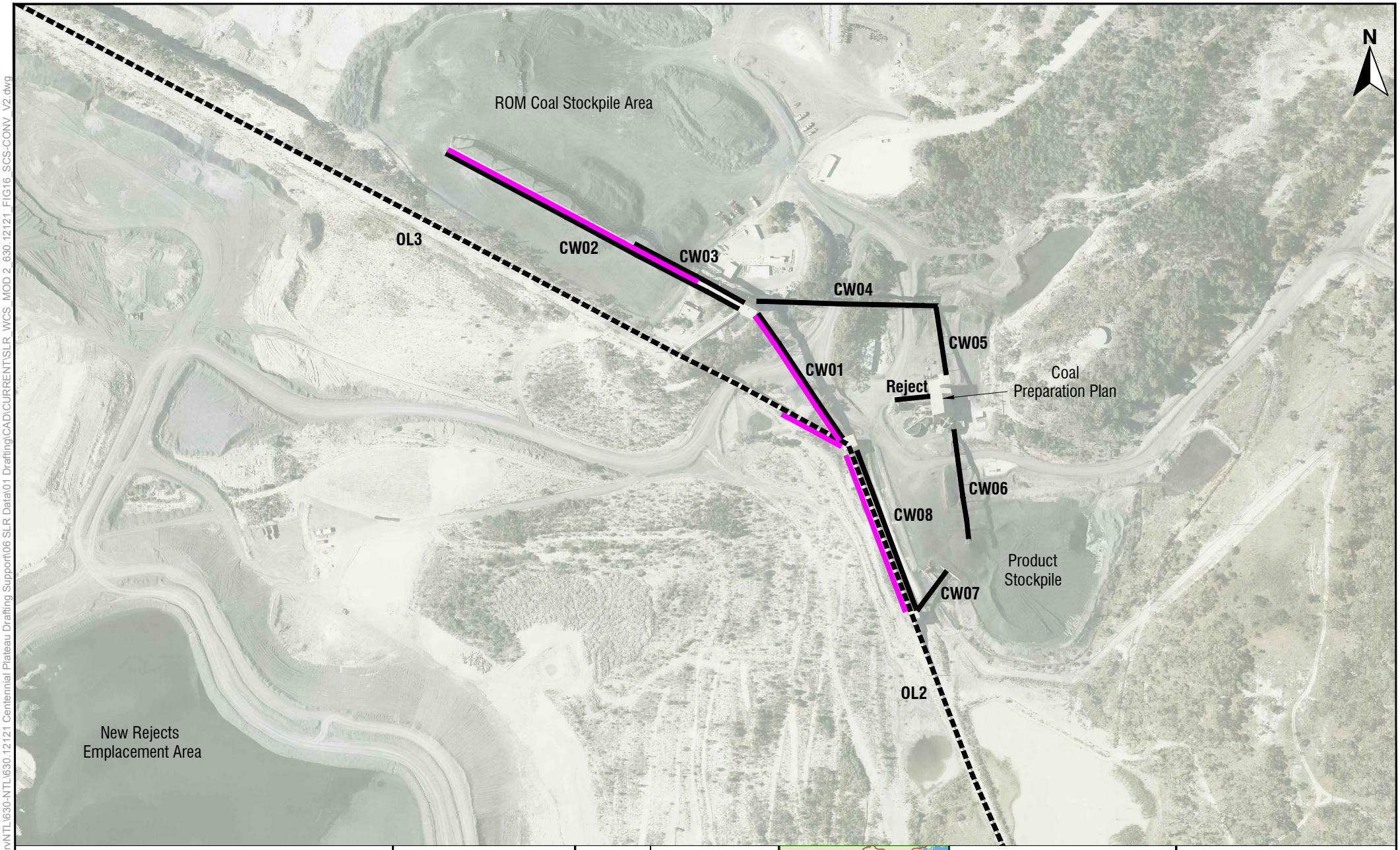

LEGEND:
- Overland Conveyor System
- Internal Conveyors
- Low Noise Idler Sections

DATE	11.08.2017
SEAM	LITHGOW
REFERENCE	SLR_WCS_MOD 2_630.12121_FIGB_SCS-CONV_PAA_V2.dwg
SCALE	1:4000

Figure 6
Conveyors within Springvale Coal Services Site

0 75 150 M

Centennial Coal
Western Coal Services

Prepared by: SLR

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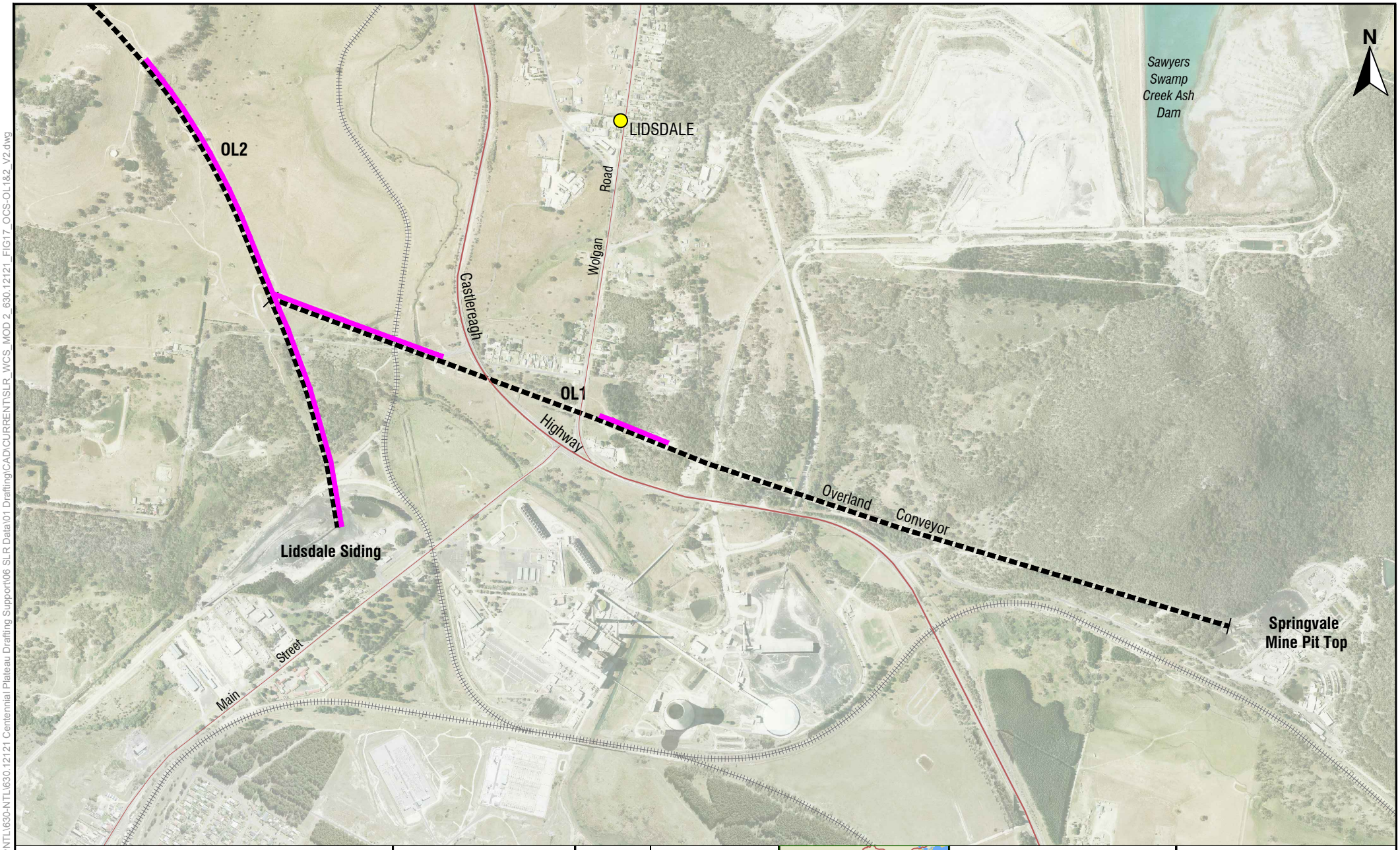

LEGEND:

- Railway
- Major Roads
- Overland Conveyor System
- Low Noise Idler Sections
- Town / City

DATE	11.08.2017
SEAM	LITHGOW
REFERENCE	SLR_WCS_MOD 2_630.12121_FIG17_OCS -OL1&2_V2.dwg
SCALE	1:15000

Figure 7

Mitigated Overland Conveyor System at OL1/OL2 Intersection

0 300 600 M

Centennial Coal
Western Coal Services

Prepared by: SLR

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Table 4.1 lists representative typical plant type and quantities included in the SCSS model scenarios. The following two scenarios were considered:

- **Scenario 1 –** SCSS approved operations without mitigation measures; and
- **Scenario 2 –** SCSS approved operations with mitigation measures.

Table 4.1: SCSS PLANT ITEMS INCLUDED IN SCENARIO 1 AND 2

Description	Scenario 1			Scenario 2		
	Day	Evening	Night	Day	Evening	Night
Upgraded CPP (7 Mtpa)	Yes	Yes	Yes	Yes (mitigated)	Yes (mitigated)	Yes (mitigated)
CPP conveyors and drives	Yes	Yes	Yes	Yes (mitigated)	Yes (mitigated)	Yes (mitigated)
Haul trucks on site	Yes (2)	Yes (1)	Yes (1)	Yes (2)	Yes (1)	Yes (1)
100t dozer	Yes	Yes	Yes	Yes	No	No
50t wheel loader	Yes	Yes	Yes	Yes	No	Yes

4.3 Plant Sound Power

All acoustically significant noise sources at SCSS have been included in the models. Global Acoustics undertake regular sound power testing of plant, therefore, sound powers used in modelling, provided in Table 4.2, were primarily based on measured levels. Where test data was not available, sound power levels for similar plant items were adopted.

$L_{Aeq,15minute}$ sound power data was used for model inputs for all sources.

Table 4.2 SOUND POWER DATA, $L_{Aeq,15minute}$ dB

	Octave Band Sound Power Spectrum, L_{eq} dB									Total L_{eq} dB	
Description	**32**	**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**	**Lin**	**A wt**
Unmitigated Plant											
CW02 drive 1	73	72	78	89	85	88	81	74	64	93	90
CW10 drive 2	63	68	70	75	74	71	67	63	53	80	76
OL3 drive 3	106	97	97	99	99	99	95	87	80	109	103
CW06 drive 4	72	73	75	78	78	77	76	71	59	85	82
CW12 drive 5	72	73	75	78	78	77	76	71	59	85	82
100t dozer	-	111	111	110	110	107	104	99	94	117	112
Transfer station 1	115	109	104	102	101	97	93	86	78	117	102
Transfer station 2	89	88	94	94	90	87	81	72	66	99	92
Transfer station 3	92	91	97	97	93	90	84	75	69	102	95
Transfer station 4	89	88	94	94	90	87	81	72	66	99	92
CPP	128	118	110	108	108	107	104	98	89	129	111
Conveyor CW01 (1m)	82	85	86	84	82	78	73	67	56	91	83
Conveyor CW02 (1m)	71	67	74	76	77	74	70	64	60	83	79
Conveyor CW03 (1m)	82	80	84	82	79	75	71	66	59	89	81
Conveyor CW04 (1m)	77	75	82	79	74	71	66	59	55	86	77
Conveyor CW05 (1m)	75	75	74	73	77	75	69	65	57	83	79
Conveyor CW06 (1m)	73	74	75	74	75	75	68	61	51	83	78
Conveyor CW07 (1m)	73	73	75	73	74	72	65	58	49	81	76
Conveyor CW08 (1m)	72	71	75	74	76	74	69	63	54	82	78
Conveyor CW09 (1m)	73	73	75	73	74	72	65	58	49	81	76
Conveyor CW10 (1m)	69	66	68	66	65	62	68	68	57	76	73
Conveyor CW11 (1m)	75	75	74	73	77	75	69	65	57	83	79
Conveyor CW12 (1m)	73	74	75	74	75	75	68	61	51	83	78
Feeder	73	82	84	82	86	82	77	72	63	91	87

	Octave Band Sound Power Spectrum, L_{eq} dB									Total L_{eq} dB	
Description	**32**	**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**	**Lin**	**A wt**
Conveyor OL3 (1m)	72	71	75	74	76	74	69	63	54	82	78
Conveyor OL3 enclosed sections (1m)	72	67	73	69	70	69	63	53	44	78	73
Conveyor CW02 enclosed sections (1m)	71	63	72	71	72	70	64	55	50	79	74
50t wheel loader	105	107	109	110	107	107	105	98	91	116	111
Haul truck	-	113	104	97	95	95	92	91	80	114	100
Mitigated Plant											
CPP	127	114	106	102	105	104	97	90	80	127	107
Conveyor CW01 (1m)	75	78	78	76	72	72	69	65	55	84	77
Conveyor CW02 (1m)	64	61	66	68	67	68	66	62	58	75	73
Conveyor OL3 (1m)	65	64	67	66	66	68	65	60	52	75	72
100t dozer	110	113	113	108	105	102	98	94	91	118	108
50t loader	101	106	106	105	106	105	102	93	90	113	109

5 RESULTS

5.1 Intrusiveness Results

Appendix A contains unmitigated and mitigated 90th percentile SCSS noise results for all private receptors included in the assessment. Table 5.1 presents 90th percentile SCSS noise results for receptors, which are specifically listed in the WCS Consent.

Table 5.1: SCSS RESULTS $L_{Aeq,15minute}$ dB

	WCS Consent Criteria			Scenario 1 Predictions (Unmitigated)			Scenario 2 Predictions (Mitigated)		
Receptor	**Day**	**Eve**	**Night**	**Day**	**Eve**	**Night**	**Day**	**Eve**	**Night**
B12	40	35	35	37	**41**	**39**	34	34	34
B13	41	36	36	41	**43**	**42**	38	36	**38**
B14	41	35	35	37	**39**	**38**	34	33	34
B15	36	35	35	**40**	**41**	**40**	**37**	**36**	**37**
B16	35	35	36	**40**	**42**	**40**	**37**	**37**	**37**
B17	42	44	45	**45***	**46***	**46***	41	43*	43*
R3	35	35	36	27	29	29	25	26	27
R4	37	37	41	22	26	26	20	19	22
L1	42	35	35	31	33	31	28	27	27
L2	40	39	35	29	30	29	27	25	27
WR1	41	38	36	28	30	29	26	24	25
WR2	38	37	35	31	32	32	28	28	28
S3	36	36	39	28	28	28	25	25	25
All other privately-owned residences	35	35	35	Refer to Appendix A					

Notes: 1. *Bolded results are higher than WCS Consent Criteria; and*

2. *"*" indicates a low frequency penalty has been applied as per Section 5.2.*

The following points are noted:

- **Unmitigated Results –** model results indicate noise would exceed the relevant day, evening and night criterion at 22, 29 and 27 receptor locations respectively, out of the 168 receptors assessed.
- **Mitigated Results –** model results indicate noise would exceed the relevant day, evening and night criterion at 9, 5 and 7 receptor locations respectively, out of the 168 receptors assessed. All of the mitigated predictions are within 2 dB of current WCS Consent criteria.

Receptors for which predictions exceed WCS Consent criteria are categorised in Table 5.2.

Table 5.2: CATEGORISED EXCEEDANCE COUNTS

	Scenario 1 Predictions (Unmitigated) Exceedance Counts			Scenario 2 Predictions (Mitigated) Exceedance Counts		
Level above criterion	**Day**	**Evening**	**Night**	**Day**	**Evening**	**Night**
1-2 dB	8	7	8	9	5	7
3-5 dB	14	15	18	0	0	0
Greater than 5dB	0	7	1	0	0	0
Total	22	29	27	9	5	7

With the proposed mitigation measures implemented, all predicted exceedances for SCSS are within 2 dB of current WCS Consent criteria.

5.2 Low Frequency Noise Assessment Results

Table 5.3 presents the count, by time period, of receivers predicted to receive levels greater than $L_{Aeq,15minute}$ 30 dB, and, a C minus A result greater than or equal to 15 dB in accordance with dING methodology. Only mitigated SCSS results from Scenario 2 have been assessed.

Table 5.3: SCSS C MINUS A LFN RESULTS

Count of receivers greater than $L_{Aeq,15minute}$ 30 dB, AND C-A ≥ 15 dB		
Day	**Evening**	**Night**
29	30	29

Table 5.4 provides details for receivers with a C minus A result greater than or equal to 15 dB, and with C -weighted levels predicted to be greater than the derived criterion (dING based).

Table 5.4: SCSS LFN dING ASSESSMENT

	$L_{Ceq,15minute}$ dB			Derived C-Weighted Criterion to meet dING	Adjusted $L_{Aeq,15minute}$ dB (adjustment/penalty in brackets)		
Receptor	**Day**	**Evening**	**Night**	**All Periods**	**Day**	**Evening**	**Night**
B17	58	**60**	**59**	58	41 (0)	43 (2)	43 (2)

B17 is only greater than than the derived criterion during the evening and night periods. Adjustment of the evening and night period predictions at B17 did not result in an exceedance of WCS Consent criteria.

5.3 Cumulative Assessment Results

The cumulative impact of SCSS mitigated operations and the Mt Piper Power Station operations were considered for the day, evening and night periods. Cumulative results are provided in Appendix B. The

following summarises the results:

- noise levels at all receptors are predicted to meet the acceptable day period amenity criterion of L_{Aeq} 55 dB.

- noise levels at all receptors are predicted to meet the acceptable evening period amenity criterion of L_{Aeq} 45 dB;

- noise levels at 2 receptors (B4 and B17) are predicted to exceed the acceptable night period criterion of L_{Aeq} 40 dB, however the cumulative prediction for B17 meets the WCS Consent night criterion of 45 dB, and B4 is acquisition upon request in the WCS Consent.

From these results, no cumulative impact is predicted for SCSS operations.

6 DISCUSSION

6.1.1 Springvale Coal Services Site

With the proposed mitigation measures implemented, SCSS operations are predicted to be not more than 1 to 2 dB above WCS Consent criteria at all assessed receptors. These predicted exceedances are not considered significant, and in accordance with Table 1 of *Voluntary Land Acquisition Policy* (DPE, 2014) they are classed as negligible. These exceedances should not be discernible by the average listener and therefore should not warrant receiver based treatment or controls. For this reason, no voluntary mitigation or land acquisition has been considered for any residence on privately owned land. However, in the event these minor exceedances are measured at receptors during compliance noise monitoring then the usual notification and investigation process should be followed by Springvale Coal as required by the WCS Consent.

SCSS results in this report were calculated using the cumulative distribution methodology. As a single value is required for comparison with the limiting criterion, it is considered appropriate to use the 90th percentile result to represent intrusive noise impact. It is important to note that 10 percent of results are higher than this number. Approving criteria based directly on model predictions, regardless of methodology (cumulative distribution or INP prevailing) is ill-advised and proven in the past to be problematic, particularly for WCS. Where criteria above predictions are considered suitable, it is recommended they be adopted prior to adopting modelled predictions to allow Springvale Coal to practically manage their operations. It should be noted that monitored levels at locations around the SCSS have closely matched model predictions.

A priority sequencing of installation of the modelled mitigation measures at SCSS discussed in Section 4.2 has been developed and is detailed in Section 7.1. Springvale Coal is proposing to complete the installation of these mitigation measures within a two-year period. The proposed sequencing should help SCSS achieve compliance in the shortest possible time frame. In the long term, the noise levels in the nearby communities will be lower than the current monitored levels.

Given that noise reductions shown in Table 5.1 and Appendix A are potentially achievable through the implementation of engineering noise controls and management of noise emissions from fixed and mobile plant, it is not considered unreasonable for Springvale Coal to request the WCS Consent noise criteria be only applicable to the SCSS operations. This should allow WCS operations to achieve compliance.

6.1.2 Haul Roads and Kerosene Vale Stockpile Area

Private haul roads provide the community a safe and acceptable alternative to public road haulage. Interestingly, noise criteria for public road use per the NSW Road Traffic Policy is much higher than for private haul road use per the INP, however, the option of moving coal haulage from these private roads to local public roads would not substantially change the noise environment but would reduce the road safety situation.

As noted in Section 1.3.2 Springvale Coal is currently undertaking a feasibility study investigating alternative surface and underground coal clearance (coal transport) options for when Angus Place Colliery commences mining in the future under existing approvals. The aim of these investigations is to determine the optimal coal clearance option that will have the least impact on the environment, however will be reasonable and feasible for Springvale Coal to implement and will meet the company's business requirements.

Springvale Coal is proposing to operate the Mt Piper and Wallerawang haul roads during the day period only when development works re-commence at Angus Place Colliery under the existing approvals. Restricting haul road operations to the day period should significantly improve the noise environment. Daytime noise is not usually a community concern given other activities (industry, farming, road traffic etc.) are taking place. Given this, the potential for noise impact is likely to be reduced and it is proposed that the haul roads are regulated via operational constraints pertaining to truck numbers as opposed to application of noise criteria. The number of trucks (80 tonne trucks) on each haul road should not exceed 12 at any one time, which historically, is the maximum that has been used during the day period.

Prior to utilising the haul roads during evening and night time periods when longwall extraction commences at Angus Place Colliery, Springvale Coal will provide the Secretary of the Department of Planning and Environment with the outcomes of the coal clearance feasibility study. Should the outcomes from this study identify the need for continued use of the Wallerawang Haul Road (evening period only) and/or Mount Piper Haul Roads during evening and night time periods, Springvale Coal will ensure all proposed noise mitigation and management measures for their uses are to the satisfaction of the Secretary prior to trucking operations commencing during these periods.

Operations at the Kerosene Vale Stockpile Area will only be undertaken during the day period as approved but limited to a maximum of operation of two loaders (50t) at any one time.

6.1.3 Overland Conveyor System

The overland conveyor system is an existing industrial noise source with a likely unchanged legacy. It is critical infrastructure for Centennial operations, which are the sole supplier of coal to the Mt Piper Power Station, which in turn supplies approximately 15 percent of New South Wales' electricity. The conveyors have been acceptable for over 20 years within the community and industrial noise impact due to them is likely unchanged. It is also noted that there has been very few complaints regarding the overland conveyors from the surrounding community. This indicates the community's acceptance of a noise environment that has existed for a long time, and prior to the establishment of new residential areas in the region. It is important to note that the attended noise monitoring data conducted by Global Acoustics since July 2014 (Section 1.4.3) is generally consistent with the historical noise data presented in Section 1.4.1 and Section 1.4.2. Regardless of this, Springvale Coal has been proactive in the recent past, investigating engineering noise controls with the potential to reduce noise emissions from the overland conveyor system in the vicinity of Lidsdale and Wallerawang sensitive receptors.

The initial mitigation investigations, undertaken by Hatch (2015), evaluated the efficacy of the installation of

sound walls along the OL1 and OL2 sections of the overland conveyor system, and replacement of the existing standard idlers with the low noise idlers for the conveyor belts. Modelling by Global Acoustics of both noise controls, in an iterative manner in isolation and in combination, identified that the installation of sound barriers or sound walls would provide minimal benefit in reducing noise in the region, however the installation of the low noise idlers would prove more effective as noise controls at OL1 and OL2 along sections shown in Figure 7. The modelling results also identified that installation along other sections of the overland conveyor system in the vicinity of the Lidsdale and Wallerawang receptors would not result in significant reduction in noise for them.

Springvale Coal has committed to upgrading the identified reasonable and feasible sections of the overland conveyor with low noise idlers, as this mitigation measure whilst costly, should reduce noise emissions and. provide the greatest benefit to residents. The installation of the low noise idlers commenced in 2016. A staged approach for the installation of these idlers was required for minimal business interruption however the installation for the identified OL1 and OL2 sections is planned to be completed by October 2017.

With Springvale Coal committed to maintaining the low noise idlers, noise levels in the surrounding community should be the lowest since inception of the overland conveyor system. It is proposed that the overland conveyor system is regulated via the installation and maintenance of the low noise idlers as opposed to noise criteria which would limit or preclude its operation.

7 NOISE MITIGATION STRATEGIES

7.1 Sequence of SCSS Mitigation Measures

The recommended priority and sequence of the proposed SCSS noise mitigation measures is outlined as follows:

1. dozer and loader operation should be restricted to their modelled periods of operation, specifically the day period only for the dozer, and the day and night periods only for the loader;

2. low noise idlers should be installed along the noisy sections of the CW01, CW02 and OL2/OL3 within SCSS (in that order);

3. install noise barriers around the OL3 drive on site;

4. clad the existing CPP with noise attenuating panels;

5. all loaders and dozers (hired or otherwise) used on site should meet as a minimum, the mitigated sound power levels detailed in Table 4.2; and

6. if the upgraded CPP is constructed, it should be designed and constructed to meet the mitigated sound power levels detailed in Table 4.2.

The above mitigation measures should be implemented on a staged basis with monitoring and model validation undertaken after each stage to determine noise level reductions achieved and evaluate if further implementation is required.

7.2 Operational Controls and Management Strategies

In addition to the SCSS mitigation measures above, the following operational controls and management strategies are recommended:

- haul truck movements on the Mt Piper and Wallerawang Haul roads during Angus Place Colliery's development phase under the existing approvals should be limited to the day period only and constrained to a maximum of 12 trucks operating on each at any one time;

- haul trucks speeds should be monitored;

- The Project should continue to investigate surface and underground coal transport options for when Angus Place Colliery commences longwall extraction for optimal operations and reduction in noise emissions to the environment as far as practicable. If a need for road haulage in the evening and night periods is ascertained for the extraction phase then mitigation and management measures should be identified and provided to the Secretary of the Department of Planning and Environment for their agreement prior to any evening and night time haulage commencing;

- low noise idlers should be implemented on the OL1 and OL2 sections of the overland conveyor system shown in Figure 7.

- Regular and systematic maintenance of the overland conveyor system should be undertaken to identify and replace/repair noisy idlers as required;

- continuation of regular sound power screening testing that will assist in managing equipment sound power levels, and identify plant items requiring maintenance;

- continuous noise monitoring should be continued at a strategic off site location to provide real time feedback to the SCSS operations team for noise management;

- monitoring of real time meteorological conditions and forecasts to assist in noise management; and

- progressively manage operations, wherever possible, in order to comply with the noise criteria.

8 RECOMMENDATIONS

The following recommendations should allow WCS operations to operate in accordance with WCS Consent noise criteria and reasonably reduce noise emissions on the environment:

- WCS Consent noise criteria should be applicable to the SCSS operations only;
- operational constraints should be applicable to the overland conveyor system, Mt Piper and Wallerawang haul roads and Kerosene Vale Stockpile Area, as opposed to noise criteria in SSD 5579 which would limit or preclude their operations;
- implement engineered noise controls on SCSS noise sources per the sequence detailed in Section 7.1 and on sections of the overland conveyor system shown in Figure 7 in a timely manner;
- operational management of mobile plant at SCSS and on the Mt Piper and Wallerawang haul roads should be undertaken;
- a real time noise monitoring and management system should be developed and implemented to manage off-site noise levels; and
- the management of operational noise and attended noise monitoring should be undertaken in accordance with an approved Noise Management Plan. Any modification to the WCS Consent would require Springvale Coal to complete a review of the Noise Management Plan and if required, submit a revised document for regulator approval.

9 SUMMARY

Global Acoustics was engaged by Springvale Coal to prepare an environmental noise impact assessment for the proposed modification to the Western Coal Services Project (SSD-5579). This assessment considers operational, low frequency, road traffic and cumulative noise for the Springvale Coal Services Site (SCSS). Proposed regulation of the private haul roads and overland conveyor system is via operational constraints.

Noise levels were predicted using ENM, a computer based environmental noise model, to determine the acoustic impact of mining operations. Results were determined using the cumulative distribution of results methodology. Frequency occurrence of modelled meteorological conditions was determined using data sourced from the Bureau of Meteorology Bathurst AWS meteorological station.

Unmitigated SCSS model results indicate noise would exceed the relevant day, evening and night criterion at 22, 29 and 27 receptor locations respectively, out of the 168 sensitive receptors assessed. Springvale Coal has investigated and proposed to implement various noise mitigation measures at SCSS. Mitigated SCSS model results reduce the exceedance counts to 9, 5 and 7 receptor locations for the day, evening and night periods respectively. All of the mitigated predictions are within 2 dB of current WCS Consent criteria.

A cumulative assessment of the SCSS mitigated model results with existing predictions for Mt Piper Power Station operations indicated noise at all receptors meets the acceptable day period criterion of L_{Aeq} 55 dB and the acceptable evening period criterion of L_{Aeq} 45 dB. Noise at receptors B4 and B17 is predicted to exceed the acceptable night period criterion of L_{Aeq} 40 dB, however B17 has a WCS Consent criterion of L_{Aeq} 45 dB, and B4 is acquisition upon request. Given this, no cumulative noise impact is predicted.

An assessment of low frequency noise in general accordance with the draft Industrial Noise Guideline of SCSS mitigated results was undertaken for all receivers, across all time periods. Predictions for B17 triggered a 2dB penalty during the evening and night periods, however, even with this penalty applied, evening and night results were less than the current WCS Consent criterion at this receptor.

Recommended mitigation measures and a sequence of their implementation is detailed for SCSS. Monitoring and validation modelling should be undertaken after each stage to determine the noise level reductions achieved and evaluate if further implementation is required. Additionally, any modification to the WCS Consent would require Springvale Coal to complete a review of the WCS Noise Management Plan and if required, submit a revised document for regulator approval.

Global Acoustics Pty Ltd

10 REFERENCES

SKM, 2007. *Western Rail Coal Unloader – Environmental Noise Assessment*

SKM, 2009. *Mt Piper Power Station Extension – Environmental Assessment*

SKM, 2010. Mt Piper Power Station Ash Placement Project – Environmental Assessment

NSW Environment Protection Authority,. *NSW Industrial Noise Policy,* Sydney NSW, January 2000, (EPA 00/1)

NSW Environment Protection Authority, 2015. *NSW Draft Industrial Noise Guideline*. Sydney: NSW Environment Protection Authority, Sydney NSW (EPA 2015/0185)

NSW Department of Environment, Climate Change and Water, March 2011. *NSW Road Noise* Policy (DECCW 2011/236)

Hatch Pty Limited, 2012. *Environmental Noise Impact Assessment, Lidsdale Siding Upgrade Project*

Sinclair Knight & Partners Pty Limited, 1992. *Environmental Impact Statement, Springvale Coal Project*

Parsons Brinckerhoff Australia Pty Limited, 2008. *Technical Report 5 – Noise and Vibration, Stage 2 Kerosene Vale Ash Repository*

RPS Australia East Pty Limited, 2013. *Environmental Impact Statement, Western Coal Services Project*

SLR Consulting Australia Pty Limited, 2013. *Noise and Vibration Impact Assessment, Western Coal Services Project*

SLR Consulting Australia Pty Limited, 2010 - 2013. *Noise Monitoring, Springvale Colliery*

Global Acoustics Pty Ltd, 2013. *Bulga Optimisation Project - Environmental Noise Assessment*

ARC Traffic and Transport, 2017 *Traffic Impact Assessment*

NSW Department of Planning and Environment, 2014. *Voluntary Land Acquisition Policy*

APPENDIX

A SCSS NOISE RESULTS

Table A.1: SCSS NOISE PREDICTIONS – $L_{Aeq,15minute}$ dB

Receptor ID	Coordinates		Scenario 1			Scenario 2		
	Easting	Northing	Day	Eve	Night	Day	Eve	Night
B4	226588	6304405	45	49	49	43	41	43
B12	226808	6304169	37	41	39	34	34	34
B13	226937	6304222	41	43	42	38	36	38
B14	227546	6304122	37	39	38	34	33	34
B15	227516	6303810	40	41	40	37	36	37
B16	227442	6303343	40	42	40	37	37	37
B17	226500	6302886	45	46	46	41	43	43
B18	224512	6302006	15	18	17	13	13	14
B19	227523	6304026	37	39	38	35	33	35
B20	227678	6303828	39	40	39	36	35	36
B21	227747	6303595	38	39	39	35	34	35
B22	227763	6303501	38	39	38	35	34	35
B23	227666	6303435	39	40	39	36	35	35
B24	227926	6303709	38	39	38	35	34	34
B25	227972	6303699	38	39	38	35	34	34
B26	228082	6303754	37	38	37	34	33	33
B27	228116	6303751	37	38	37	34	33	33
B28	228067	6303705	37	38	38	34	33	34
B29	228085	6303702	36	38	37	33	32	32
B30	228102	6303700	36	37	36	33	31	32
B31	228163	6303613	35	37	36	32	31	32

Receptor ID	Coordinates		Scenario 1			Scenario 2		
	Easting	Northing	Day	Eve	Night	Day	Eve	Night
B32	227695	6303362	37	38	38	34	31	33
B33	227765	6303127	36	37	36	33	32	32
B34	227778	6303117	35	37	35	33	32	32
B35	228163	6303614	35	36	36	32	31	32
B36	228076	6302708	29	30	29	26	25	25
B37	228250	6302487	26	28	27	24	24	24
B38	228310	6302573	31	33	32	28	27	27
B39	228441	6302208	29	30	29	27	26	27
B40	228509	6302248	30	31	30	28	27	27
B41	228489	6302098	29	30	29	27	25	27
B42	228550	6302043	29	31	30	27	27	27
B43	228562	6301978	29	31	31	27	27	28
B44	228528	6302715	27	28	27	24	24	23
B45	228622	6302789	28	30	28	27	24	25
B46	228603	6302791	28	29	28	27	23	25
B47	228583	6302795	28	29	28	26	23	25
B48	228563	6302797	27	29	27	26	23	25
B49	228544	6302798	27	29	27	26	23	25
B50	228523	6302791	24	26	24	24	23	23
B51	228425	6302779	23	25	22	20	22	19
B52	228925	6303683	33	34	33	30	29	29
B53	228168	6302895	35	37	34	32	32	31
B54	227547	6303738	40	41	40	37	35	36

Receptor ID	Coordinates		Scenario 1			Scenario 2		
	Easting	Northing	Day	Eve	Night	Day	Eve	Night
B55	227527	6303315	40	41	40	37	36	36
B56	227459	6303171	40	41	39	36	36	36
B57	227535	6303175	39	40	39	36	36	35
B58	227633	6303105	39	40	39	36	35	35
B59	228610	6302180	30	32	30	28	27	27
B60	228687	6301953	30	31	30	28	26	27
L1	229078	6302626	31	33	31	28	27	27
L2	229028	6301777	29	30	29	27	25	27
L3	228690	6301071	27	28	27	25	25	25
L4	228628	6301082	27	28	28	25	25	25
L5	228607	6301085	27	29	28	25	25	25
L6	228585	6301092	27	29	28	25	25	25
L7	228567	6301095	27	29	28	25	25	25
L8	228547	6301096	27	29	28	25	25	25
L9	228528	6301098	27	29	28	25	25	25
L10	228482	6301107	27	29	28	25	26	25
L11	228509	6301164	27	29	28	25	26	25
L12	228472	6301131	27	29	28	25	26	25
L13	228445	6301116	27	29	28	25	26	25
L14	228426	6301119	26	29	27	24	26	25
L15	228449	6301157	27	29	28	25	26	25
L16	228753	6301146	28	29	28	26	25	25
L17	228692	6301112	27	28	28	25	25	25

Receptor ID	Coordinates		Scenario 1			Scenario 2		
	Easting	Northing	Day	Eve	Night	Day	Eve	Night
L18	228705	6301138	28	29	28	26	25	25
L19	228704	6301176	28	29	28	26	25	26
L20	228785	6301201	28	29	28	26	25	25
L21	228705	6301193	21	22	21	20	19	19
L22	228707	6301213	20	22	21	18	18	18
L23	228974	6301043	27	28	28	25	24	24
L24	228984	6301139	28	28	28	25	24	25
L25	228966	6301227	28	29	28	25	24	25
L26	228769	6301269	28	29	29	26	25	26
L27	228967	6301298	28	29	28	25	24	25
L28	228806	6301362	29	29	29	26	25	26
L29	228807	6301393	23	24	23	21	20	20
L30	228725	6301421	22	23	22	20	19	19
L31	229049	6301453	28	29	29	26	25	25
L32	229009	6301442	28	29	29	26	25	26
L33	228930	6301569	29	29	29	26	25	26
L34	228953	6301588	29	29	29	26	25	26
L35	228971	6301629	29	29	29	27	25	26
L36	228991	6301636	29	29	29	27	25	26
L37	228990	6301677	29	30	29	27	25	27
L38	229007	6301692	29	30	29	27	25	26
L39	229003	6301737	29	30	30	27	25	27
L40	229005	6301759	29	30	30	27	25	27

Receptor ID	Coordinates		Scenario 1			Scenario 2		
	Easting	Northing	Day	Eve	Night	Day	Eve	Night
L41	228909	6301626	29	30	29	27	25	26
L42	228936	6301675	29	29	29	26	25	26
L43	228941	6301695	29	29	29	26	25	26
L44	228958	6301740	26	27	26	25	21	24
L45	228945	6301795	26	27	27	25	21	24
L46	228881	6301635	26	26	26	24	20	24
L47	228873	6301672	26	27	27	25	22	24
L48	228831	6301694	26	27	27	25	21	24
L49	228842	6301740	24	25	25	22	20	22
L50	228849	6301760	26	27	27	24	21	24
L51	228848	6301786	26	27	27	25	21	24
L52	228852	6301807	26	27	27	25	21	24
L53	228791	6301737	30	30	30	27	26	27
L54	228802	6301785	29	30	30	27	26	27
L55	228708	6301806	30	30	30	27	26	27
L56	228794	6301817	27	27	27	25	21	24
L57	228642	6301891	30	31	31	28	27	28
L58	228855	6301846	29	30	30	27	26	27
L59	228865	6301861	30	30	30	28	26	27
L60	228860	6301883	30	30	30	28	26	27
L61	228814	6301882	30	31	30	28	27	27
L62	228866	6301899	30	30	30	28	26	27
L63	228801	6301912	30	31	30	28	27	27

Receptor ID	Coordinates		Scenario 1			Scenario 2		
	Easting	Northing	Day	Eve	Night	Day	Eve	Night
L64	228874	6301930	30	30	30	28	27	27
L65	228879	6301943	30	30	30	27	27	27
L66	228880	6301971	30	31	30	28	27	27
L67	228906	6301997	30	30	30	27	27	27
L68	228881	6302046	30	31	30	28	27	27
L69	228832	6302028	30	31	30	28	27	27
L70	228924	6302069	30	31	30	28	27	27
L71	228908	6302122	30	31	31	28	27	27
L72	228917	6302157	30	31	31	28	27	27
L73	228906	6302215	31	31	31	28	27	27
L74	228752	6302222	31	32	31	28	27	28
L75	228919	6302286	31	31	31	28	27	27
L76	228919	6302303	31	32	31	28	27	27
L77	228973	6302313	31	31	31	28	27	27
L78	228923	6302339	31	32	31	28	27	27
L79	228925	6302353	31	32	31	28	27	27
L80	228937	6302369	31	32	31	28	27	27
L81	228936	6302385	31	32	31	28	27	27
L82	228932	6302406	31	32	31	28	27	27
L83	228937	6302419	31	32	31	28	27	27
L84	228939	6302438	31	32	31	28	27	27
L85	228944	6302453	31	32	31	28	27	27
L86	228943	6302472	31	32	31	28	27	27

Receptor ID	Coordinates		Scenario 1			Scenario 2		
	Easting	Northing	Day	Eve	Night	Day	Eve	Night
L87	228981	6302478	31	32	31	28	27	27
L88	228956	6302503	31	32	31	28	27	27
L89	228951	6302521	31	32	31	28	27	27
L90	228955	6302538	31	32	31	28	27	27
L91	228962	6302552	31	32	31	28	27	27
L92	228959	6302570	31	33	31	28	27	27
L93	228961	6302588	32	33	31	29	28	27
L94	228962	6302612	32	33	32	29	28	28
L95	228966	6302629	31	32	31	28	28	27
L96	228979	6302659	30	32	30	27	27	26
L97	228912	6302661	30	32	30	27	27	25
L98	228960	6303141	32	33	32	29	28	28
L99	229028	6303579	32	33	33	29	29	29
L100	229213	6303684	32	33	32	29	28	28
L101	229226	6303849	31	33	32	28	28	28
R1	228036	6300415	28	28	28	25	24	25
R2	227837	6300179	27	28	28	25	24	25
R3	227420	6300654	27	29	29	25	26	27
R4	227484	6301148	22	26	26	20	19	22
R7	227300	6299746	27	28	28	24	24	25
R8	227568	6299831	27	28	28	24	24	25
R9	227415	6299619	26	28	28	24	24	24
R10	226917	6300236	18	28	28	15	23	24

Receptor ID	Coordinates		Scenario 1			Scenario 2		
	Easting	Northing	Day	Eve	Night	Day	Eve	Night
R11	226928	6300457	14	23	21	12	18	18
R12	226936	6300677	14	22	21	11	15	16
S1	230210	6299703	22	23	23	20	19	19
S2	230469	6299536	22	22	22	19	18	18
S3	228775	6301089	28	28	28	25	25	25
S4	231589	6299387	19	19	19	16	15	16
S5	232009	6299182	18	18	18	16	14	15
WR1	229391	6305106	28	30	29	26	24	25
WR2	229342	6304611	31	32	32	28	28	28

Notes: 1. Receptors B4 and R1 currently have rights to acquisition upon request

APPENDIX

B CUMULATIVE NOISE IMPACT RESULTS

Table C.1: CUMULATIVE NOISE PREDICTIONS - $L_{Aeq,15minute}$ dB

Receptor ID	SCSS Mitigated Result			Mt Piper Power Station Operations Result			Cumulative Result with 2dB adjustment		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
B4	43	41	43	42	42	36	44	43	42
B12	34	34	34	42	42	36	41	41	36
B13	38	36	38	42	42	36	42	41	38
B14	34	33	34	42	42	36	41	41	36
B15	37	36	37	42	42	36	41	41	38
B16	37	37	37	42	42	36	41	41	38
B17	41	43	43	43	43	36	43	44	42
B18	13	13	14	39	39	30	37	37	28
B19	35	33	35	42	42	36	41	41	37
B20	36	35	36	42	42	36	41	41	37
B21	35	34	35	42	42	34	41	40	36
B22	35	34	35	42	42	34	41	40	36
B23	36	35	35	42	42	34	41	41	36
B24	35	34	34	42	42	34	41	40	35
B25	35	34	34	42	42	34	41	40	35
B26	34	33	33	42	42	34	40	40	35
B27	34	33	33	42	42	34	40	40	35
B28	34	33	34	42	42	34	40	40	35
B29	33	32	32	42	42	34	40	40	34
B30	33	31	32	42	42	34	40	40	34
B31	32	31	32	42	42	34	40	40	34
B32	34	31	33	42	42	34	40	40	35

Receptor ID	SCSS Mitigated Result			Mt Piper Power Station Operations Result			Cumulative Result with 2dB adjustment		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
B33	33	32	32	42	42	34	40	40	34
B34	33	32	32	42	42	34	40	40	34
B35	32	31	32	42	42	34	40	40	34
B36	26	25	25	36	36	30	35	35	29
B37	24	24	24	36	36	30	34	34	29
B38	28	27	27	36	36	30	35	35	30
B39	27	26	27	36	36	30	35	35	30
B40	28	27	27	36	36	30	35	35	30
B41	27	25	27	36	36	30	35	35	30
B42	27	27	27	36	36	30	35	35	30
B43	27	27	28	36	36	30	35	35	30
B44	24	24	23	36	36	30	34	34	29
B45	27	24	25	36	36	30	35	34	29
B46	27	23	25	36	36	30	35	34	29
B47	26	23	25	36	36	30	35	34	29
B48	26	23	25	36	36	30	35	34	29
B49	26	23	25	36	36	30	35	34	29
B50	24	23	23	36	36	30	34	34	29
B51	20	22	19	36	36	30	34	34	28
B52	30	29	29	36	36	30	35	35	31
B53	32	32	31	36	36	30	36	36	32
B54	37	35	36	36	36	30	35	33	34
B55	37	36	36	36	36	30	35	34	34

Receptor ID	SCSS Mitigated Result			Mt Piper Power Station Operations Result			Cumulative Result with 2dB adjustment		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
B56	36	36	36	36	36	30	34	34	34
B57	36	36	35	36	36	30	34	34	33
B58	36	35	35	36	36	30	34	33	33
B59	28	27	27	36	36	30	26	25	25
B60	28	26	27	36	36	30	26	24	25
L1	28	27	27	<25	<25	<25	26	25	25
L2	27	25	27	<25	<25	<25	25	23	25
L3	25	25	25	<25	<25	<25	23	23	23
L4	25	25	25	<25	<25	<25	23	23	23
L5	25	25	25	<25	<25	<25	23	23	23
L6	25	25	25	<25	<25	<25	23	23	23
L7	25	25	25	<25	<25	<25	23	23	23
L8	25	25	25	<25	<25	<25	23	23	23
L9	25	25	25	<25	<25	<25	23	23	23
L10	25	26	25	<25	<25	<25	23	24	23
L11	25	26	25	<25	<25	<25	23	24	23
L12	25	26	25	<25	<25	<25	23	24	23
L13	25	26	25	<25	<25	<25	23	24	23
L14	24	26	25	<25	<25	<25	22	24	23
L15	25	26	25	<25	<25	<25	23	24	23
L16	26	25	25	<25	<25	<25	24	23	23
L17	25	25	25	<25	<25	<25	23	23	23
L18	26	25	25	<25	<25	<25	24	23	23

Receptor ID	SCSS Mitigated Result			Mt Piper Power Station Operations Result			Cumulative Result with 2dB adjustment		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
L19	26	25	26	<25	<25	<25	24	23	24
L20	26	25	25	<25	<25	<25	24	23	23
L21	20	19	19	<25	<25	<25	18	17	17
L22	18	18	18	<25	<25	<25	16	16	16
L23	25	24	24	<25	<25	<25	23	22	22
L24	25	24	25	<25	<25	<25	23	22	23
L25	25	24	25	<25	<25	<25	23	22	23
L26	26	25	26	<25	<25	<25	24	23	24
L27	25	24	25	<25	<25	<25	23	22	23
L28	26	25	26	<25	<25	<25	24	23	24
L29	21	20	20	<25	<25	<25	19	18	18
L30	20	19	19	<25	<25	<25	18	17	17
L31	26	25	25	<25	<25	<25	24	23	23
L32	26	25	26	<25	<25	<25	24	23	24
L33	26	25	26	<25	<25	<25	24	23	24
L34	26	25	26	<25	<25	<25	24	23	24
L35	27	25	26	<25	<25	<25	25	23	24
L36	27	25	26	<25	<25	<25	25	23	24
L37	27	25	27	<25	<25	<25	25	23	25
L38	27	25	26	<25	<25	<25	25	23	24
L39	27	25	27	<25	<25	<25	25	23	25
L40	27	25	27	<25	<25	<25	25	23	25
L41	27	25	26	<25	<25	<25	25	23	24

Receptor ID	SCSS Mitigated Result			Mt Piper Power Station Operations Result			Cumulative Result with 2dB adjustment		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
L42	26	25	26	<25	<25	<25	24	23	24
L43	26	25	26	<25	<25	<25	24	23	24
L44	25	21	24	<25	<25	<25	23	19	22
L45	25	21	24	<25	<25	<25	23	19	22
L46	24	20	24	<25	<25	<25	22	18	22
L47	25	22	24	<25	<25	<25	23	20	22
L48	25	21	24	<25	<25	<25	23	19	22
L49	22	20	22	<25	<25	<25	20	18	20
L50	24	21	24	<25	<25	<25	22	19	22
L51	25	21	24	<25	<25	<25	23	19	22
L52	25	21	24	<25	<25	<25	23	19	22
L53	27	26	27	<25	<25	<25	25	24	25
L54	27	26	27	<25	<25	<25	25	24	25
L55	27	26	27	<25	<25	<25	25	24	25
L56	25	21	24	<25	<25	<25	23	19	22
L57	28	27	28	<25	<25	<25	26	25	26
L58	27	26	27	<25	<25	<25	25	24	25
L59	28	26	27	<25	<25	<25	26	24	25
L60	28	26	27	<25	<25	<25	26	24	25
L61	28	27	27	<25	<25	<25	26	25	25
L62	28	26	27	<25	<25	<25	26	24	25
L63	28	27	27	<25	<25	<25	26	25	25
L64	28	27	27	<25	<25	<25	26	25	25

Receptor ID	SCSS Mitigated Result			Mt Piper Power Station Operations Result			Cumulative Result with 2dB adjustment		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
L65	27	27	27	<25	<25	<25	25	25	25
L66	28	27	27	<25	<25	<25	26	25	25
L67	27	27	27	<25	<25	<25	25	25	25
L68	28	27	27	<25	<25	<25	26	25	25
L69	28	27	27	<25	<25	<25	26	25	25
L70	28	27	27	<25	<25	<25	26	25	25
L71	28	27	27	<25	<25	<25	26	25	25
L72	28	27	27	<25	<25	<25	26	25	25
L73	28	27	27	<25	<25	<25	26	25	25
L74	28	27	28	<25	<25	<25	26	25	26
L75	28	27	27	<25	<25	<25	26	25	25
L76	28	27	27	<25	<25	<25	26	25	25
L77	28	27	27	<25	<25	<25	26	25	25
L78	28	27	27	<25	<25	<25	26	25	25
L79	28	27	27	<25	<25	<25	26	25	25
L80	28	27	27	<25	<25	<25	26	25	25
L81	28	27	27	<25	<25	<25	26	25	25
L82	28	27	27	<25	<25	<25	26	25	25
L83	28	27	27	<25	<25	<25	26	25	25
L84	28	27	27	<25	<25	<25	26	25	25
L85	28	27	27	<25	<25	<25	26	25	25
L86	28	27	27	<25	<25	<25	26	25	25
L87	28	27	27	<25	<25	<25	26	25	25

Receptor ID	SCSS Mitigated Result			Mt Piper Power Station Operations Result			Cumulative Result with 2dB adjustment		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
L88	28	27	27	<25	<25	<25	26	25	25
L89	28	27	27	<25	<25	<25	26	25	25
L90	28	27	27	<25	<25	<25	26	25	25
L91	28	27	27	<25	<25	<25	26	25	25
L92	28	27	27	<25	<25	<25	26	25	25
L93	29	28	27	<25	<25	<25	27	26	25
L94	29	28	28	<25	<25	<25	27	26	26
L95	28	28	27	<25	<25	<25	26	26	25
L96	27	27	26	<25	<25	<25	25	25	24
L97	27	27	25	<25	<25	<25	25	25	23
L98	29	28	28	<25	<25	<25	27	26	26
L99	29	29	29	<25	<25	<25	27	27	27
L100	29	28	28	<25	<25	<25	27	26	26
L101	28	28	28	<25	<25	<25	26	26	26
R1	25	24	25	<25	<25	<25	23	22	23
R2	25	24	25	<25	<25	<25	23	22	23
R3	25	26	27	<25	<25	<25	23	24	25
R4	20	19	22	<25	<25	<25	18	17	20
R7	24	24	25	<25	<25	<25	22	22	23
R8	24	24	25	<25	<25	<25	22	22	23
R9	24	24	24	<25	<25	<25	22	22	22
R10	15	23	24	<25	<25	<25	13	21	22
R11	12	18	18	<25	<25	<25	10	16	16

Receptor ID	SCSS Mitigated Result			Mt Piper Power Station Operations Result			Cumulative Result with 2dB adjustment		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
R12	11	15	16	<25	<25	<25	9	13	14
S1	20	19	19	<25	<25	<25	18	17	17
S2	19	18	18	<25	<25	<25	17	16	16
S3	25	25	25	<25	<25	<25	23	23	23
S4	16	15	16	<25	<25	<25	14	13	14
S5	16	14	15	<25	<25	<25	14	12	13
WR1	26	24	25	<25	<25	<25	24	22	23
WR2	28	28	28	<25	<25	<25	26	26	26

Notes: 1. Receptors B4 and R1 currently have rights to acquisition upon request

APPENDIX

C MODELLED METEOROLOGICAL CONDITIONS

Table E.1: MODELLED METEOROLOGICAL CONDITIONS

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	0	0	-0.5
10	80	0	0	1.5
10	80	0	0	4
10	80	0.75	0	-0.5
10	80	0.75	22.5	-0.5
10	80	0.75	45	-0.5
10	80	0.75	67.5	-0.5
10	80	0.75	90	-0.5
10	80	0.75	112.5	-0.5
10	80	0.75	135	-0.5
10	80	0.75	157.5	-0.5
10	80	0.75	180	-0.5
10	80	0.75	202.5	-0.5
10	80	0.75	225	-0.5
10	80	0.75	247.5	-0.5
10	80	0.75	270	-0.5
10	80	0.75	292.5	-0.5
10	80	0.75	315	-0.5
10	80	0.75	337.5	-0.5
10	80	1.5	0	-0.5
10	80	1.5	22.5	-0.5
10	80	1.5	45	-0.5
10	80	1.5	67.5	-0.5
10	80	1.5	90	-0.5
10	80	1.5	112.5	-0.5
10	80	1.5	135	-0.5
10	80	1.5	157.5	-0.5
10	80	1.5	180	-0.5
10	80	1.5	202.5	-0.5
10	80	1.5	225	-0.5
10	80	1.5	247.5	-0.5
10	80	1.5	270	-0.5
10	80	1.5	292.5	-0.5
10	80	1.5	315	-0.5
10	80	1.5	337.5	-0.5

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	2.25	0	-0.5
10	80	2.25	22.5	-0.5
10	80	2.25	45	-0.5
10	80	2.25	67.5	-0.5
10	80	2.25	90	-0.5
10	80	2.25	112.5	-0.5
10	80	2.25	135	-0.5
10	80	2.25	157.5	-0.5
10	80	2.25	180	-0.5
10	80	2.25	202.5	-0.5
10	80	2.25	225	-0.5
10	80	2.25	247.5	-0.5
10	80	2.25	270	-0.5
10	80	2.25	292.5	-0.5
10	80	2.25	315	-0.5
10	80	2.25	337.5	-0.5
10	80	3	0	-0.5
10	80	3	22.5	-0.5
10	80	3	45	-0.5
10	80	3	67.5	-0.5
10	80	3	90	-0.5
10	80	3	112.5	-0.5
10	80	3	135	-0.5
10	80	3	157.5	-0.5
10	80	3	180	-0.5
10	80	3	202.5	-0.5
10	80	3	225	-0.5
10	80	3	247.5	-0.5
10	80	3	270	-0.5
10	80	3	292.5	-0.5
10	80	3	315	-0.5
10	80	3	337.5	-0.5
10	80	0.75	0	1.5
10	80	0.75	22.5	1.5
10	80	0.75	45	1.5
10	80	0.75	67.5	1.5
10	80	0.75	90	1.5

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	0.75	112.5	1.5
10	80	0.75	135	1.5
10	80	0.75	157.5	1.5
10	80	0.75	180	1.5
10	80	0.75	202.5	1.5
10	80	0.75	225	1.5
10	80	0.75	247.5	1.5
10	80	0.75	270	1.5
10	80	0.75	292.5	1.5
10	80	0.75	315	1.5
10	80	0.75	337.5	1.5
10	80	1.5	0	1.5
10	80	1.5	22.5	1.5
10	80	1.5	45	1.5
10	80	1.5	67.5	1.5
10	80	1.5	90	1.5
10	80	1.5	112.5	1.5
10	80	1.5	135	1.5
10	80	1.5	157.5	1.5
10	80	1.5	180	1.5
10	80	1.5	202.5	1.5
10	80	1.5	225	1.5
10	80	1.5	247.5	1.5
10	80	1.5	270	1.5
10	80	1.5	292.5	1.5
10	80	1.5	315	1.5
10	80	1.5	337.5	1.5
10	80	2.25	0	1.5
10	80	2.25	22.5	1.5
10	80	2.25	45	1.5
10	80	2.25	67.5	1.5
10	80	2.25	90	1.5
10	80	2.25	112.5	1.5
10	80	2.25	135	1.5
10	80	2.25	157.5	1.5
10	80	2.25	180	1.5
10	80	2.25	202.5	1.5

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	2.25	225	1.5
10	80	2.25	247.5	1.5
10	80	2.25	270	1.5
10	80	2.25	292.5	1.5
10	80	2.25	315	1.5
10	80	2.25	337.5	1.5
10	80	3	0	1.5
10	80	3	22.5	1.5
10	80	3	45	1.5
10	80	3	67.5	1.5
10	80	3	90	1.5
10	80	3	112.5	1.5
10	80	3	135	1.5
10	80	3	157.5	1.5
10	80	3	180	1.5
10	80	3	202.5	1.5
10	80	3	225	1.5
10	80	3	247.5	1.5
10	80	3	270	1.5
10	80	3	292.5	1.5
10	80	3	315	1.5
10	80	3	337.5	1.5
10	80	0.75	0	4
10	80	0.75	22.5	4
10	80	0.75	45	4
10	80	0.75	67.5	4
10	80	0.75	90	4
10	80	0.75	112.5	4
10	80	0.75	135	4
10	80	0.75	157.5	4
10	80	0.75	180	4
10	80	0.75	202.5	4
10	80	0.75	225	4
10	80	0.75	247.5	4
10	80	0.75	270	4
10	80	0.75	292.5	4
10	80	0.75	315	4

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	0.75	337.5	4
10	80	1.5	0	4
10	80	1.5	22.5	4
10	80	1.5	45	4
10	80	1.5	67.5	4
10	80	1.5	90	4
10	80	1.5	112.5	4
10	80	1.5	135	4
10	80	1.5	157.5	4
10	80	1.5	180	4
10	80	1.5	202.5	4
10	80	1.5	225	4
10	80	1.5	247.5	4
10	80	1.5	270	4
10	80	1.5	292.5	4
10	80	1.5	315	4
10	80	1.5	337.5	4
10	80	2.25	0	4
10	80	2.25	22.5	4
10	80	2.25	45	4
10	80	2.25	67.5	4
10	80	2.25	90	4
10	80	2.25	112.5	4
10	80	2.25	135	4
10	80	2.25	157.5	4
10	80	2.25	180	4
10	80	2.25	202.5	4
10	80	2.25	225	4
10	80	2.25	247.5	4
10	80	2.25	270	4
10	80	2.25	292.5	4
10	80	2.25	315	4
10	80	2.25	337.5	4
10	80	3	0	4
10	80	3	22.5	4
10	80	3	45	4
10	80	3	67.5	4

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	3	90	4
10	80	3	112.5	4
10	80	3	135	4
10	80	3	157.5	4
10	80	3	180	4
10	80	3	202.5	4
10	80	3	225	4
10	80	3	247.5	4
10	80	3	270	4
10	80	3	292.5	4
10	80	3	315	4
10	80	3	337.5	4

Traffic Impact Assessment

APPENDIX - E

Western Coal Services Project

Modification 2

Traffic Impact Assessment

August 2017

prepared for

Springvale Coal Pty Ltd

prepared by

ARC Traffic + Transport

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Introduction

Springvale Coal Pty Ltd (Springvale Coal) proposes a Modification (MOD 2) to the State Significant Development 5579 (SSD 5579) consent for Western Coal Services Project (the Project). The Traffic Impact Assessment is in regard to the existing Springvale Coal Services Site (the SCS Site), one of the components of the Project, located at Castlereagh Highway, Blackmans Flat. The proposed increase in workforce in the Project would primarily be based at the SCS Site. Modification 2 would allow for: -

- An increase in the amount of coal that can be received at the SCS Site from the Springvale Mine from 4.5 Mtpa to up to 5.5 Mtpa;
- Establishment of a dedicated product coal stockpile of 80,000 tonne capacity in the vicinity of the coal preparation plant (washery);
- A revision in the application of noise limits in SSD 5579 (Schedule 3 Condition 9) to the Project components; and
- An increase in workforce from the approved 18 full time equivalent (fte) personnel to 25 fte personnel.

ARC Traffic + Transport (ARC) has been commissioned by Springvale Coal to prepare this Traffic Impact Assessment to appropriately and independently assess the access, traffic and parking characteristics of the Modification 2 proposal. In this regard, ARC has: -

- Reviewed past reports relating to the SCS Site and the broader Project, and in particular the 2013 Western Coal Services Project's Traffic Impact Assessment (WCS TIA) prepared by Barnson which supported the (subsequently approved) *Environmental Impact Statement* for the Project for the SSD 5579 development application;
- Reviewed additional reports prepared between 2010 and 2016 by ARC in regard to numerous sub-regional mining projects, including proposals for the Angus Place Colliery and Springvale Mine;
- Reviewed the Modification 2 components, and specifically examined those components of Modification 2 with the potential to impact the local or sub-regional road network, or on-site operations; and
- Referenced the appropriate traffic and transport guidelines and assessment criteria, including: -
    - RTA Guide to Traffic Generating Developments (RTA Guide)
    - AustRoads Rural Road Design Guide (AustRoads RRDG)
    - AustRoads Guide to Road Design Part 4A Unsignalised and Signalised Intersections (AustRoads GRD4A)

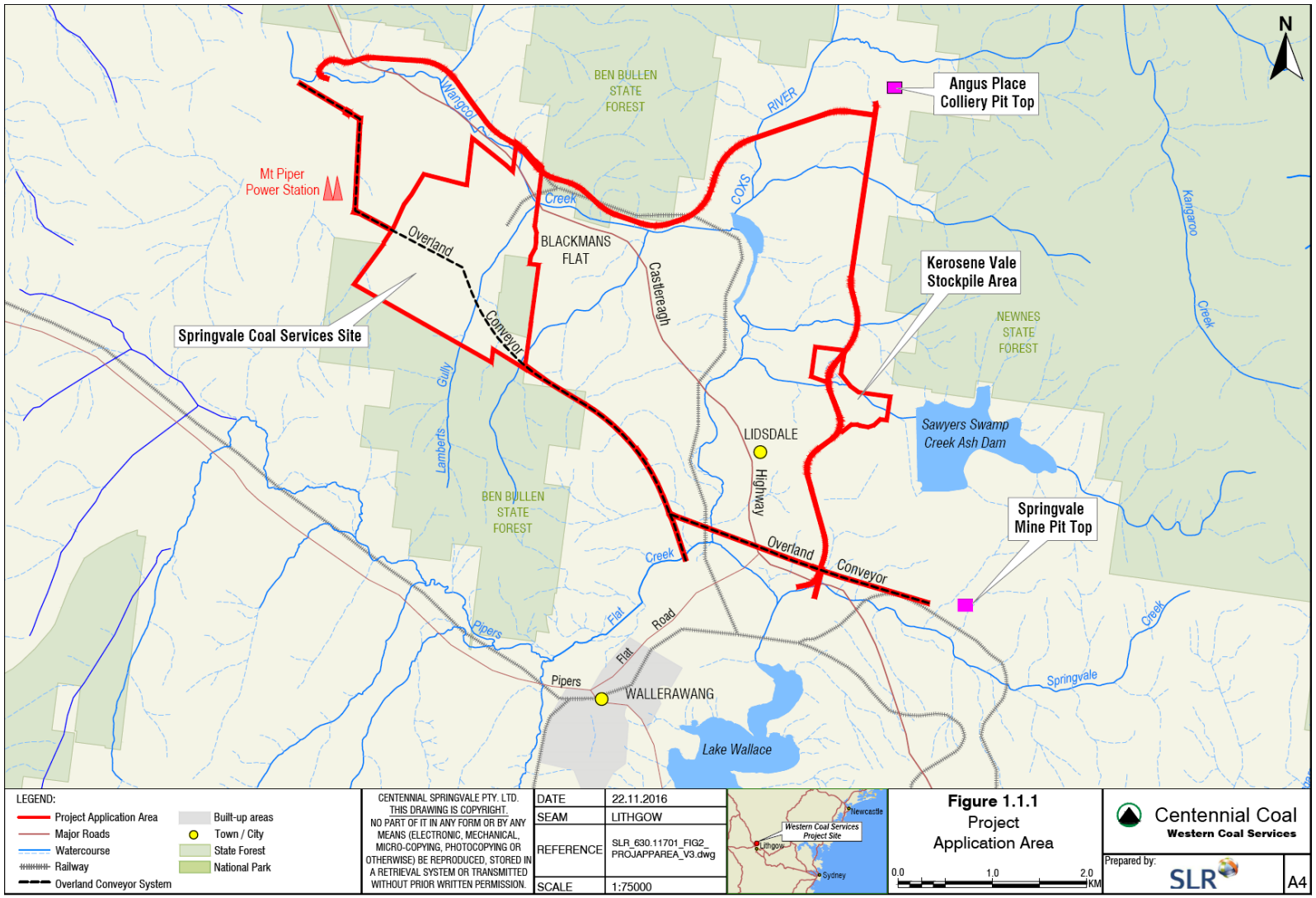
From the outset, it is noted that in our opinion the only component of Modification 2 which would in any way alter the existing (approved) access, traffic and parking characteristics of the WCS Site or its operations is the addition of (7 fte) staff. The relative 'impacts' of such are the focus of this assessment.

1 The Existing Site

1.1 Location

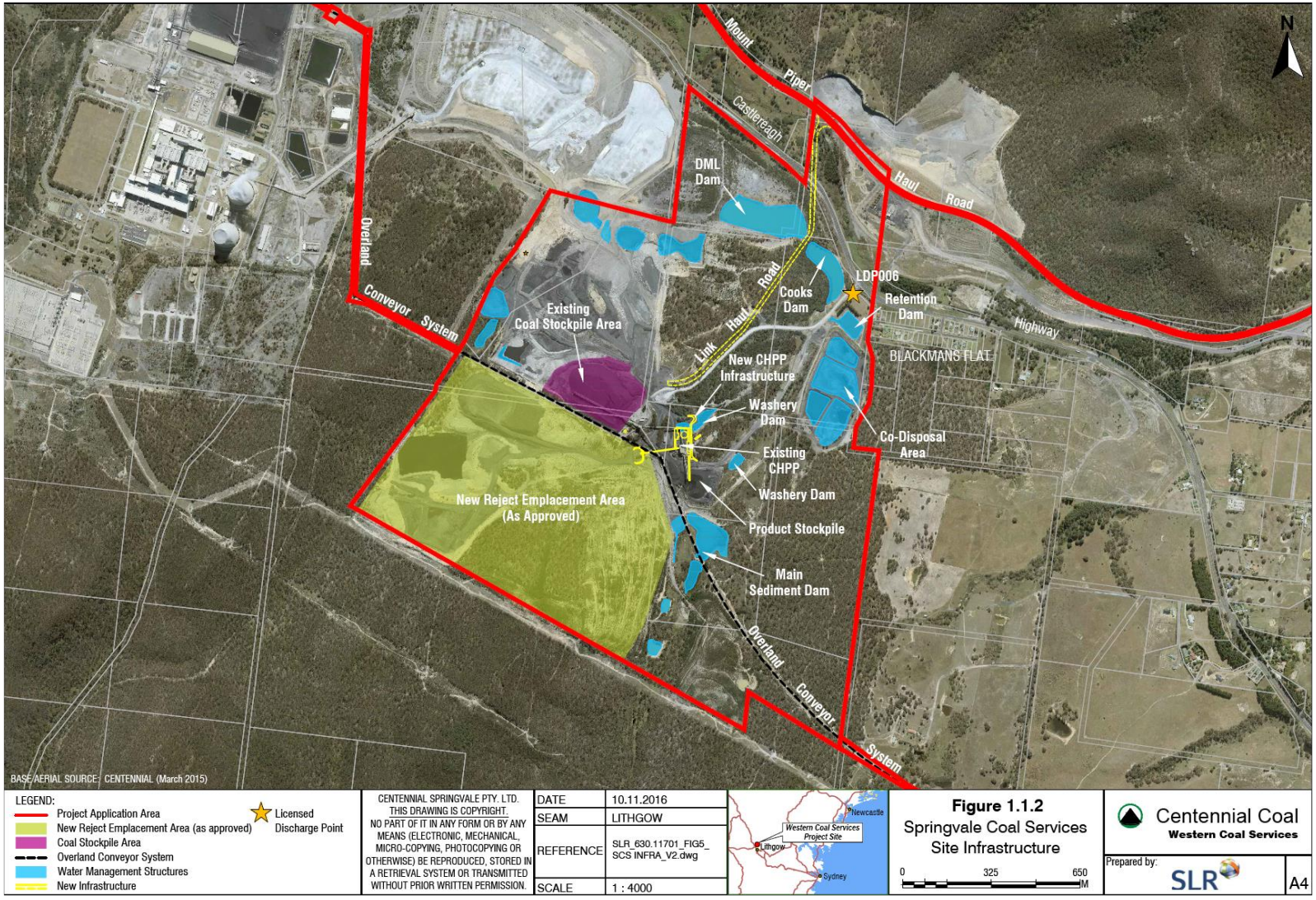
The Project Application Area in its sub-regional context is shown in **Figure 1.1.1**. The largest land component in the Project Application Area, the Springvale Coal Services Site is located on the Castlereagh Highway, Blackmans Flat, approximately 18km west of Lithgow. A more detailed plan of the SCS Site itself is provided in **Figure 1.1.2**.

Figure 1.1.1 Western Coal Services Project Application Area



Source: Springvale Coal

Figure 1.1.2 The Springvale Coal Services Site



Source: Springvale Coal

1.2 Current Site Operations

The Project is approved to receive up to 4.5Mtpa from the Springvale Coal Mine; up to 4Mtpa from the Angus Place Colliery; and up to 1Mtpa from other sources within the broader region, to a total of no more than 9.5Mtpa. In addition, the SSD 5579 approval provides for up to 7Mtpa to be processed through the washery; the conveyance of no more than 6.3Mtpa to the Lidsdale Siding; and the transport of no more than 6.7Mtpa to the local domestic power stations (Mt Piper and Wallerawang).

As discussed in the Introduction, Modification 2 would provide for an increase in the amount of coal received from the Springvale Coal Mine from the current limit of 4.5Mtpa to a new limit of 5.5Mtpa.

The SSD 5579 consent lapses on 30th June 2039; there is no proposal to change this expiration date.

1.3 Hours of Operation & Workforce

1.3.1 Hours of Operation

The SSD 5579 consent provides for operations at the SCS Site to be undertaken 24 hours a day, 7 days a week. Use of the private haul road (Wallerawang Haul Road) connecting the Angus Place Colliery pit top and the Wallerawang Power Station, now being decommissioned, is restricted to the hours 7:00am to 10:00pm 7 days a week, while the use of the private haul road between Angus Place Colliery and the Mt Piper Power Station (Mount Piper Haul Road) is permitted 24 hours a day, 7 days a week with a movement restricted (5 loaded trucks per hour) between 9:30pm and 7:00am. A private Link Road, linking the Springvale Coal Services Site with the Mount Piper Haul Road (refer Figure 1.1.2) is approved in SSD 5579 but has not yet been constructed.

1.3.2 Operational Workforce

The SSD 5579 approval provides for the employment of 18 full time equivalent (fte) staff at the SCS Site. These include: -

- 5 fte administration and management staff generally working 7:00am to 5:00pm;
- 9 fte day-shift staff, 6:00am – 6:00pm; and
- 4 fte night shift staff, 6:00pm to 6:00am.

It is noted that a small number of contractors (maintenance and servicing for example) can also be on-site daily.

1.4 Access

From the outset, it is noted that the primary traffic generation of the WCS Project is limited to the private haul roads, the general operations of which would not be affected by the Modification 2 proposal (i.e. their operations would remain within the parameters established by the existing SSD 5579 consent). As such, this assessment focuses on the staff access (and then trip generation) to the SCS Site. The SCS Site is accessed from Castlereagh Highway via an access road at Blackmans Flat.

In this regard, the SCS Site provides a priority T intersection to Castlereagh Highway via which all staff travel to and from the SCS Site. As described in the WCS TIA, the intersection provides an Auxiliary Right (AUR) right turn treatment whereby an eastbound vehicle is provided with an additional lane through the intersection to pass a right turning vehicle. In addition, an Auxiliary Left (AUL) lane is provided, allowing a decelerating vehicle (entering the SCS Site from the east) to decelerate without impacting a westbound through vehicle.

The WCS TIA provided recommendations in regard to the line-marking of the intersection, which (at the time of preparing the WCS TIA) were considered not to be compliant with RMS standards; it is the understanding of ARC that this recommendation was accepted by Springvale Coal, and the recommended line-marking completed in 2014. Based on March 2017 photos of the intersection provided to ARC by Springvale Coal, the key line marking through the intersection appears to be in generally good condition, as shown in the figures below.

Figure 1.4.1 Intersection Castlereagh Highway & WSC Site March 2017 (North from WCS Site)

Source: Springvale Coal

Figure 1.4.2 Intersection Castlereagh Highway & WSC Site March 2017 (South from WCS Site)

Source: Springvale Coal

Notwithstanding, the only line marking which might warrant remediation is the (priority) stop-line on the SCS Site approach, which as shown in **Figure 1.4.1** appears to be partially faded.

In addition, the photos provided by Springvale Coal indicate the transfer of materials (gravel/sand) from either the SCS Site approach or adjacent verge areas to the intersection, as shown in both figures above and more clearly in **Figure 1.4.3** below.

Figure 1.4.3 Loose Materials on SCS Site Approach to Castlereagh Highway

Source: Springvale Coal

Based on our discussions with Springvale Coal, it is likely that these materials were deposited during periods of heavy rain in the area prior to the photos being taken in April 2017. Notwithstanding, the potential for such transfer may also relate to the relative short length of sealed pavement of the SCS Site approach to the intersection. To mitigate this issue, regular cleaning of the intersection could be undertaken to remove such materials from the intersection, particularly after periods of heavy rain. Such cleaning would require Springvale Coal to obtain an appropriate Road Occupancy Licence from the RMS, as well as provide details of a Traffic Control Plan for the duration of the cleaning.

An alternative to regular cleaning would likely entail an extension of the sealed SCS Site approach and additional wash off/wash down measures, though it is our opinion that such may be prohibitively expensive, particularly given the very minor trip generation of the SCS Site.

More generally, it must be acknowledged that the existing intersection design has – at a previous time – been approved by the RMS, not only in regard to the most recent Modification 1 approval (as detailed in the WCS TIA) but when originally designed and constructed.

1.5 Existing Castlereagh Highway & SCS Site Intersection

It is in our opinion immediately apparent that the only location which might be impacted by the additional (staff) trip generation provided for by Modification 2 would be the SCS Site access intersection to the Castlereagh Highway as described above.

1.5.1 Castlereagh Highway Traffic Flows

The WCS TIA reports RMS traffic data which shows a (2013) Annual Average Daily Traffic (AADT) flow in the Castlereagh Highway south of the Boulder Road intersection (Portland) of 4,300 vpd (vehicles per day), including 17% heavy vehicles.

This RMS data tallies well with recent (2015) surveys commissioned by ARC in Castlereagh Highway south-east of Main Street (i.e. adjacent to the Springvale Mine) which indicated an Average Daily Traffic (ADT) flow of 5,500 vpd, and an Average Weekday Traffic (AWT) flows of 5,800 vpd noting that the higher flow reported at this survey location reflects the additional (primarily) south-east distribution between the Castlereagh Highway and key (trip generating) roads such as Main Street (Wallerawang) and Wolgan Road (Lidsdale).

As the WCS TIA reported survey (Castlereagh Highway at Portland) does not provide any detailed breakdown of hourly trips, ARC has referenced the 2015 survey data to determine such, noting that it is expected that both sites would exhibit a similar distribution of trips across the day. In this regard, the 2015 survey data indicates that: -

- Castlereagh Highway traffic flows during the SCS Site AM peak hour (6:00am) are estimated to represent 6% of AADT, or some 260 vehicles per hour (vph);

- Castlereagh Highway traffic flows during the SCS Site PM peak hour (6:00pm) are estimated to represent 7% of AADT, or some 300 vph; and
- A slightly higher proportion of AM peak period trips are south-east bound, while a slightly higher proportion of PM peak period trips are north-west bound.

1.5.2 WCS Site Staff Trip Generation

The peak generation of the SCS Site would occur during shift changeover periods (approximately 5:30am – 6:30am, and approximately 5:30pm to 6:30pm); during these periods, the potential exists for the SCS Site to generate a total of 13 vph, being 9 day-shift staff arrival trips and 4 night-shift staff departure trips in the AM peak hour, and 4 night-shift staff arrival trips and 9 day-shift departure trips in the PM peak hour. This peak generation assumes all day and night-shift staff arrive/depart in their own private vehicle, and that all trips occur in single AM and PM peak hours.

It is expected that the majority to these trips would be to/from the south-east (Wallerawang and Lithgow).

1.5.3 Intersection Performance

Based on the traffic flow estimates provided in **Section 1.5.1** for the Castlereagh Highway, and assigning a distribution profile of 80% of trips to/from the south-east to the traffic flow estimates in **Section 1.5.2** for SCS Site trips, ARC has assessed the intersection performance using the SIDRA model. This analysis indicates that the intersection operates at a high level of service ('A') with essentially no delays/queueing and retains very significant spare capacity.

It is noted further that the existing design of the intersection would conform to current warrant requirements as provided in GRD4A, and indeed provide (auxiliary infrastructure) in excess of the warrants when considering the AUL.

1.6 On-Site Access & Parking

The existing on-site staff car park provides capacity for some 50 staff vehicles, and as such (based on current peak staff demands) provides significant spare capacity. It is our understanding that the available car park capacity was originally design to provide not only for operational staff but also construction staff during approved SCS Site works (in accordance with SSD 5579).

It is acknowledged that the car park provides only a road base/gravel surface, and that spaces are not line-marked. However, it is our understanding that this design provides compliance with consent SSD 5579, and it is noted that there is not scarcity of 'spaces' such as might warrant line-marking (i.e. to maximise capacity).

2 Modification 2

2.1 Modification 2 Components

As discussed in the Introduction, Modification 2 would allow for: -

- An increase in the amount of coal that can be received at the WCS Site from the Springvale Coal Mine from 4.5 Mtpa to up to 5.5 Mtpa;
- Establishment of a dedicated product coal stockpile of 80,000 tonne capacity in the vicinity of the coal preparation plant (washery);
- A revision in the application of noise limits in SSD 5579 (Schedule 3 Condition 9) to the Project components; and
- Increase in workforce from the approved 18 fte personnel to 25 fte personnel.

As discussed previously, the only component of Modification 2 which in our opinion could 'impact' the existing access, traffic and parking environment would be the increase in full-time equivalent staff, from the existing 18 fte staff to 25 fte staff. Of the proposed increase by 7 fte personnel, 5 of the additional fte staff would be assigned to the existing day-shift, and 2 of the additional fte staff would be assigned to the night-shift. No changes are proposed to the existing management and administration staffing levels.

2.2 Access

Modification 2 would not change existing SCS Site access provisions, either in regard to the use (and management in accordance with approval conditions) of the private haul roads, nor – of specific relevance to this assessment – the existing SCS Site access intersection to the Castlereagh Highway as detailed in **Section 1.2**. All of the additional staff movements arising from Modification 2 would be generated to and from the SCS Site via this existing intersection.

As discussed in **Section 1.4**, during the preparation of this assessment a reasonable amount of loose material was observed within the SCS Site approach to the Castlereagh Highway intersection which, based on our discussions with Springvale Coal, was likely deposited during recent periods of heavy rain in the area. As such, at a minimum it is recommended that regular cleaning of the intersection be undertaken to removed such materials (gravel/sand) from the intersection, particularly after periods of heavy rain, noting that such cleaning would require Springvale Coal to obtain an appropriate Road Occupancy Licence from the RMS, as well as provide details of a Traffic Control Plan for the duration of the cleaning.

An alternative to regular cleaning would likely entail an extension of the formal sealed SCS Site approach and additional wash off/wash down). It is noted that the extension of the sealed driveway (alone) would generally be in line with the sediment control measures described in the (former) Department of Environment & Conservation's A Resource Guide for Local Councils – Erosion and Sediment Control; and in Landcom's Managing Urban Stormwater Volume 1 – Soils and Construction.

Finally, ARC also recommends the remarking of the SCS Site approach stop-line in accordance with the appropriate RMS guidelines.

2.3 Future Castlereagh Highway & Site Intersection Operations

2.3.1 Future Castlereagh Highway Traffic Flows

2010 RMS data for the (previously available) Lidsdale Count Station (as referenced by ARC for assessments of the Springvale Mine) indicated traffic flow increases in the Castlereagh Highway of approximately 1.7% per year. As no longer term AADT data is provided in the WCS TIA for the 2013 Portland count station (i.e. to show average annual growth) this previously determined average growth rate of 1.7% has been applied to the more recent Portland count station AADT, noting again that it is reasonable to suggest the two count station sites would experience similar growth.

With reference to the 2013 AADT data detailed in the WCS TIA, this would suggest 2027 forecast flows in the Castlereagh Highway past the SCS Site of: -

- Approximately 5,200 vpd;
- Approximately 310 vph in the SCS Site AM peak period; and
- Approximately 360 vph in the SCS Site PM peak period.

With regard to additional potential future trip generators in the sub-region, ARC notes that at present the Angus Place Colliery is operating under 'Care & Maintenance' provisions, i.e. with minimal staff (noting that 2 development crews were transferred to operations at Springvale Mine). It is our understanding that there is little if any potential for Angus Place Colliery to recommence peak mining operations prior to the end of mining at the Springvale Mine. However, even if the Angus Place Colliery peak operations were to recommence (at the same time as peak Springvale Mine operations) then the additional trip generation to the Castlereagh Highway at the WCS Site would be minimal, based simply on the fact that only a small minority of mining staff have origins/destinations to the north-west (i.e. to/from the Castlereagh Highway at the WCS Site).

It is also the case that the AADT flows reported by the RMS in the local network in 2013 (as referenced in the WCS TIA) would have included the Angus Colliery peak trip generation, and trips generated by the Wallerawang Power Station, which has ceased operations and is currently being demolished.

Finally, as part of previous assessments in the sub-regional, ARC sourced information from the DP&E website in regard to approved and proposed sub-regional projects with the potential to generate additional trips to the Castlereagh Highway at the SCS Site intersection to Castlereagh Highway and through the broader road network. A more recent review of these projects suggests that there is little potential for additional trip generation in the foreseeable future, with many previously proposed projects having been either refused or withdrawn, or determined to generate only very minor additional traffic generation.

2.3.2 WCS Project Staff Trip Generation

The future peak generation of the SCS Site would continue to occur at shift changeover times (6:00am and 6:00pm). During these periods, the potential exists for the SCS Site to generate an additional 7 vehicle trips per hour, being: -

- In the AM arrival peak hour (5:30am – 6:30am): -
  - 5 additional day-shift staff arrival trips
  - 2 additional night-shift staff departure trips

- In the PM arrival peak hour (5:30pm – 6:30pm): -
  - 5 additional day-shift staff departure trips
  - 2 additional night-shift staff arrival trips

With reference to the estimates of existing trip generation provided in **Section 1.5.2**, the total trip generation of the SCS Site would therefore increase from 13 vph to 20 vph in both the AM and PM peak hours. Again, this total assumes all staff drive their own private vehicles, and that all shift staff arrive/depart in a single (AM and PM) peak hour.

It is expected that the majority to these trips would be to/from the south-east (Wallerawang and Lithgow).

2.3.3 Intersection Performance

Based on the future traffic flow estimates provided in **Section 2.3.1** for the Castlereagh Highway, and assigning a distribution profile of 80% of trips to/from the south-east to the traffic flow estimates in **Section 2.3.2** for SCS Site trips, ARC has again assessed the performance of the Castlereagh Highway & SCS Site intersection using the SIDRA model. This analysis indicates that the intersection continues to operate at a high level of service ('A') with essentially no delays/queueing and retains significant spare capacity; essentially, the additional staff trips have no significant impact on any of the key intersection performance measures.

Similarly, it remains the case that the existing intersection design would conform to current warrant requirements as provided in GRD4A even further to the background flow increases in the Castlereagh Highway and the proposed staff trip increases.

In summary, it is the conclusion of ARC that Modification 2 would have no significant impact on the key SCS Site access intersection to Castlereagh Highway, nor any significant impact on the broader local and sub-regional road network.

2.4 Access & Parking

Modification 2 would in no way alter the existing access driveway path between the Castlereagh Highway and the car park. As stated, the car park itself provides capacity for up to 50 vehicles, and as such the peak parking demand (estimated at 25 spaces assuming all staff are on-site for a short period before the end of a shift – either day or night) would be entirely accommodated within the existing car park.

3 Conclusions

Further to a detailed assessment of the Modification 2 proposal, ARC has determined that Modification 2 is supportable in regard to access, traffic and parking considerations. Specifically, ARC has determined that: -

- The only potential impact arising from Modification 2 relates to the 'impact' of additional staff (7) vehicle trips; the primary generation of the SCS Site to private haul roads would continue to provide compliance with SSD conditions.

- This additional staff trip generation would be by any measure minor, resulting in no more than 7 additional vehicle trips to/from the SCS Site AM and PM peak periods.

- Further to this increase – and accounting for a forecast year 2027 - the SCS Site access intersection to the Castlereagh Highway will continue to operate at a high level of service (Level of Service 'A'), with essentially no delays or queued vehicles, and with significant spare capacity. In addition, reference to AustRoads guidelines indicates that these future flows would not require any higher order intersection treatment to that currently provided.

- No changes to existing on-site staff access are proposed, and the available on-site car parking will provide fully for the additional staff parking demand.

Further to these conclusions, ARC provides the following recommendations to further enhance the safety of the Castlereagh Highway & SCS Site intersection: -

- That the SCS Site approach priority stop-line be remarked in accordance with the appropriate RMS guidelines.

- That regular cleaning of the intersection be undertaken to remove loose material (sand/gravel) from the intersection, particularly after periods of heavy rain; or alternatively, Springvale Coal that examine the potential for an extension of the formal sealed SCS Site approach to the intersection.

Air Quality Impact Assessment

APPENDIX – F

global environmental solutions

Air Quality Impact Assessment

Western Coal Services Project - Modification 2

Report Number 610.17140-R01

10 August 2017

Springvale Coal Pty Limited

PO Box 198

Wallerawang NSW 2845

Version: v1.3

Air Quality Impact Assessment

Western Coal Services Project - Modification 2

Springvale Coal Pty Limited

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.17140-R01-v1.3	10 August 2017	Varun Marwaha	G Starke	K.Lawrence
610.17140-R01-v1.2	26 July 2017	Varun Marwaha	G Starke	G Starke
610.17140-R01-v1.1	7 July 2017	Varun Marwaha	G Starke	G Starke

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TABLES

FIGURES

ABBREVIATIONS

3D	3-dimensional
%	Percent
µg	Microgram
µg/m^3	microgram per cubic metre of air
µm	micrometre or micron
AP-42	US EPA Emission Factor Handbook
AHD	Australian Height Datum
AQIA	air quality impact assessment
DDG	dust deposition gauge
EETM	Emission Estimation Technique Manual
EF	Emission Factor
EPA	Environment Protection Authority
FEL	front-end loader
g/m^2/month	grams per square metre per month
HVAS	High Volume Air Sampler
ha	Hectare
kg	Kilogram
kg/hr	kilogram per hour
km	Kilometre
km E	kilometres east
km N	kilometres north
m	Metre
M	Million
m/s	metre per second
m^2	square metre
m^3	cubic metre
mm	Millimetre
MPPS	Mount Piper Power Station
Mt	million tonnes
Mtpa	million tonnes per annum
(NCAA)	National Clean Air Agreement
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NPI	National Pollutant Inventory (Australia)
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
PAA	Project Application Area
PM	Particulate Matter
PM_{10}	particular matter with an equivalent aerodynamic diameter of 10 microns or less
$PM_{2.5}$	particular matter with an equivalent aerodynamic diameter of 2.5 microns or less
REA	Reject Emplacement Areas
ROM	run of mine
SCSS	Springvale Coal Services Site
SRTM	Shuttle Radar Topography Mission
SSD	State Significant Development
t	tonne
tpa	tonnes per annum
TSP	total suspended particulate matter
US EPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
WCS	Western Coal Services
WPS	Wallerawang Power Station
WRF	Weather Research and Forecast Model

GLOSSARY

air dispersion model	A computer-based software program which provides a mathematical prediction of how pollutants from a source will be distributed in the surrounding area under specific conditions of wind, temperature, humidity and other environmental factors
airshed	The geographical area associated with a given air supply
ambient	Pertaining to the surrounding environment or prevailing conditions
atmosphere	A gaseous mass surrounding the planet Earth that is retained by Earth's gravity. It is divided into five layers. Most of the weather and clouds are found in the first layer
atmospheric stability	The tendency of the atmosphere to resist or enhance vertical motion
atmospheric pressure	The force per unit area exerted against a surface by the weight of air above that surface in the Earth's atmosphere
background	The existing air quality in the Project area excluding the impacts from the proposed development
CALMET	A meteorological model that develops wind and temperature fields on a three-dimensional gridded modelling domain
CALPOST	A post-processor used to process CALPUFF files, producing tabulations that summarize results of the simulation for user-selected averaging periods
CALPUFF	A transport and dispersion model that advects “puffs” of material emitted from modelled sources, simulating dispersion and transformation processes
dust deposition	Settling of particulate matter out of the air through gravitational effects (dry deposition) and scavenging by rain and snow (wet deposition)
dispersion	The spreading and dilution of substances emitted in a medium (e.g. air or water) through turbulence and mixing effects
diurnal	Relating to or occurring in a 24-hour period; daily
downwind	The direction in which the wind is blowing
emission factor	A measure of the amount of a specific pollutant or material emitted by a specific process, fuel, equipment, or source based on activity data such as the quantity of fuel burnt, hours of operation or quantity of raw material consumed.
emissions inventory	A database that lists, by source, the amount of air pollutants discharged into the atmosphere from a facility over a set period of time (e.g. per annum, per hour)
guideline	A general rule, principle, or piece of advice. A statement or other indication of policy or procedure by which to determine a course of action.
meteorological	The science that deals with the phenomena of the atmosphere, especially weather and weather conditions
mixing height	The height to which the lower atmosphere will undergo mechanical or turbulent mixing, producing a nearly homogeneous air mass
modelling domain	The area over which the model is making predictions
particulate	Of, relating to, or formed of minute separate particles. A minute separate particle, as of a granular substance or powder
plume	A space in air, water, or soil containing pollutants released from a point source
pollutant	A substance or energy introduced into the environment that has undesired effects, or adversely affects the usefulness of a resource
prognostic	A prediction of the value of variables for some time in the future on the basis of

	the values at the current or previous times
receptor	Coordinate locations specified in an air dispersion model where ground level pollutant concentrations are calculated by the model
sensitive receptor	Locations such as residential dwellings, hospitals, churches, schools, recreation areas etc where people (particularly the young and elderly) may often be present, or locations with sensitive vegetation and crops.
spatial variation	Pertaining to variations across an area
standard	The prescribed level of a pollutant in the outside air that should not be exceeded during a specific time period to protect public health
temporal variation	Pertaining to variations with time
topography	Detailed mapping or charting of the features of a relatively small area, district, or locality
wind direction	The direction from which the wind is blowing
wind erosion	Detachment and transportation of loose topsoil or sand due to action by the wind
wind rose	A meteorological diagram depicting the distribution of wind direction and speed at a location over a period of time

1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Springvale Coal Pty Ltd (Springvale Coal) to undertake an Air Quality Impact Assessment (AQIA) for the Western Coal Services Project (WCS) Modification 2. Springvale Coal operates the Springvale Colliery and the Western Coal Services Project.

The original WCS Project was granted State Significant Development Consent (SSD) 5579 on 04 April 2014, for a project life of 25 years. SSD-5579 allows for the operation and construction of infrastructure to facilitate the receipt, handling and processing of coal from the Springvale Mine, Angus Place Colliery and other Centennial Coal operations, and the transportation of this coal to local power stations or the Centennial Coal operated Lidsdale Rail Siding.

The main components of the approved SSD 5579 are:

- The Springvale Coal Services Site (SCSS) – for run-of-mine (ROM) coal handling and stockpiling, ROM coal beneficiation and reject material emplacement;
- Kerosene Vale ROM coal stockpile area;
- Overland conveyor system – from Springvale pit top to Mount Piper Power Station (MPPS) via SCSS, and from SCSS to Lidsdale Rail Siding (PA08_0223);
- Mount Piper Haul Road between Angus Place Colliery pit top and MPPS;
- Wallerawang Haul Road between Angus Place Colliery pit top and Wallerawang Power Station (WPS); and
- A private link road between Mount Piper Haul Road and SCSS.

The WCS Project is approved to receive:

- Up to 4.5 Mtpa ROM coal from the Springvale mine pit top via the overland conveyor system;
- Up to 4 Mtpa ROM coal from the Angus Place Colliery to WPS (now being decommissioned) and MPPS using haul roads; and
- Up to 1 Mtpa ROM coal from other Centennial Coal sources.

The SCSS is restricted to handle a total maximum throughput of 9.5 Mtpa, process a maximum of 7 Mtpa through the washery, convey a maximum of 6.3 Mtpa to Lidsdale Siding and transport a maximum of 6.7 Mtpa to the local domestic power stations (WPS and MPPS).

Springvale Coal is seeking a modification to SSD-5579 (Modification 2) to allow for (Centennial 2017):

- An increase in the amount of coal that can be received at the SCSS via conveyors from the Springvale Mine pit top from 4.5 Million tonnes per annum (Mtpa) to up to 5.5 Mtpa;
- Establishment of a 80,000 tonne product coal stockpile (near the washery) within the SCSS; and
- A revision in the application of the consent noise limits to the Project components.

A proposed increase in ROM coal production at Springvale Mine from the approved 4.5 Mtpa to 5.5 Mtpa (Springvale Mine's Modification 1, approved on 19 April 2017) necessitates an increase in the amount of ROM coal that can be received at SCSS from that mine via conveyor to up to 5.5 Mtpa. However, the additional 1 Mtpa of coal from Springvale Mine will fall within the maximum 9.5 Mtpa of ROM coal approved for receivable by the WCS Project in SSD 5579.

The AQIA for the WCS Project was completed by Pacific Environment Limited in July 2013 (PEL 2013) [hereafter the 'PEL report']. A total of five operational scenarios were assessed, investigating options for two haul roads (Mount Piper and Wallerawang Haul Roads) and an internal link road route at the SCSS, connecting SCSS with the Mount Piper Haul Road. A detailed review of the PEL report was performed as part this study.

In addition, SLR completed an AQIA for Springvale Mine in April 2016 (SLR 2016). For consistency, the AQIA presented in this report references some information and data compiled as part of the Springvale Mine AQIA (SLR 2016).

An overview of how the methodology used in this study relates to the methodology and inputs used in the PEL report and the Springvale Mine AQIA is provided below:

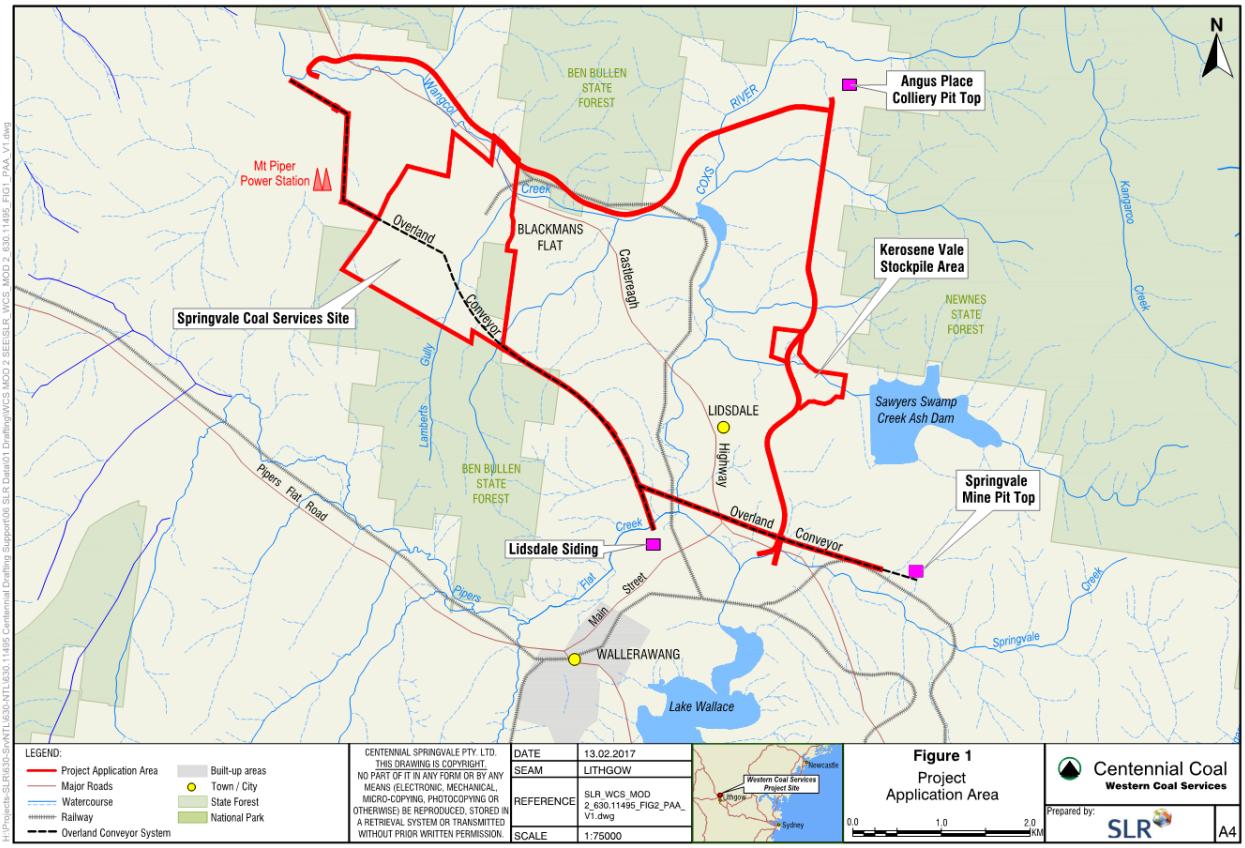
- Topographical data - Identical to the Springvale Mine AQIA, and discussed in **Section 2.4**.
- Sensitive receptors – Differs from receptor list in the PEL report. Six Blackmans Flat receptors (B1-B3, B5 – B11) included in the PEL report have since been purchased by Springvale Coal and have been removed from the analysis. A total of 168 receptors (**Figure 5**, **Appendix A**) have been identified in the vicinity of the Project Application Area (PAA) that has the potential to be impacted by the WCS operations. This assessment has analysed in detail, the top twelve worst potentially impacted identified sensitive receptors and additional representative receptors in proximity of the WCS PAA.
- Emission estimation methodology and emission factors used - For approved activities, the emission rates from the PEL report have been adopted. Specifically, the maximum emissions from the scenarios related to link route 2 (Scenarios 1b, 2b and 2c) in the PEL report were used in this assessment as the 'Approved' scenario (see **Section 4.1**). For the proposed new emission sources, emission rates were estimated using the USEPA emission factors (see **Section 4.2**).
- Meteorological data - Identical methodology used to that adopted for meteorological data used in the Springvale Mine AQIA (SLR 2016), with an expanded meteorological domain, to accommodate for the much larger area covered by the WCS Project operations compared to that covered by Springvale Mine AQIA (see **Section 5.4**). Also, the same meteorological data was expanded to be consistent with the meteorological data used for other sites within the applicable meteorological domain (i.e. Springvale Mine).
- Dispersion model – The CALPUFF model was used in 3D mode, as per the Springvale Mine AQIA (SLR 2016). The PEL report used the steady-state model ISCMOD. Therefore, the predicted results showed in the PEL report should not be viewed as directly comparable to those presented in this report.
- Background air quality data – Adopted from WCS monitoring data and data from Bathurst AQMS. A detailed description is provided in this current assessment (see **Section 5.6**).

2 PROJECT OVERVIEW

2.1 Project Location

The WCS PAA incorporates operations at multiple sites, including the SCSS, which is located adjacent to the Castlereagh Highway, approximately 16 kilometres (km) to the northwest of Lithgow and approximately 5 km from the township of Wallerawang, NSW. The PAA also includes, Kerosene Vale stockpile area, private haul roads (Mt Piper Haul Road, Wallerawang Haul Road, Link Haul Road), and the overland conveyer system traversing from Springvale Mine pit top to the MPPS via the SCSS and between SCSS and Lidsdale Siding . The WCS PAA boundary is shown in **Figure 1**.

Figure 1 Project Application Area for Western Coal Services Project



2.2 Project Elements with Potential for Air Quality Impacts

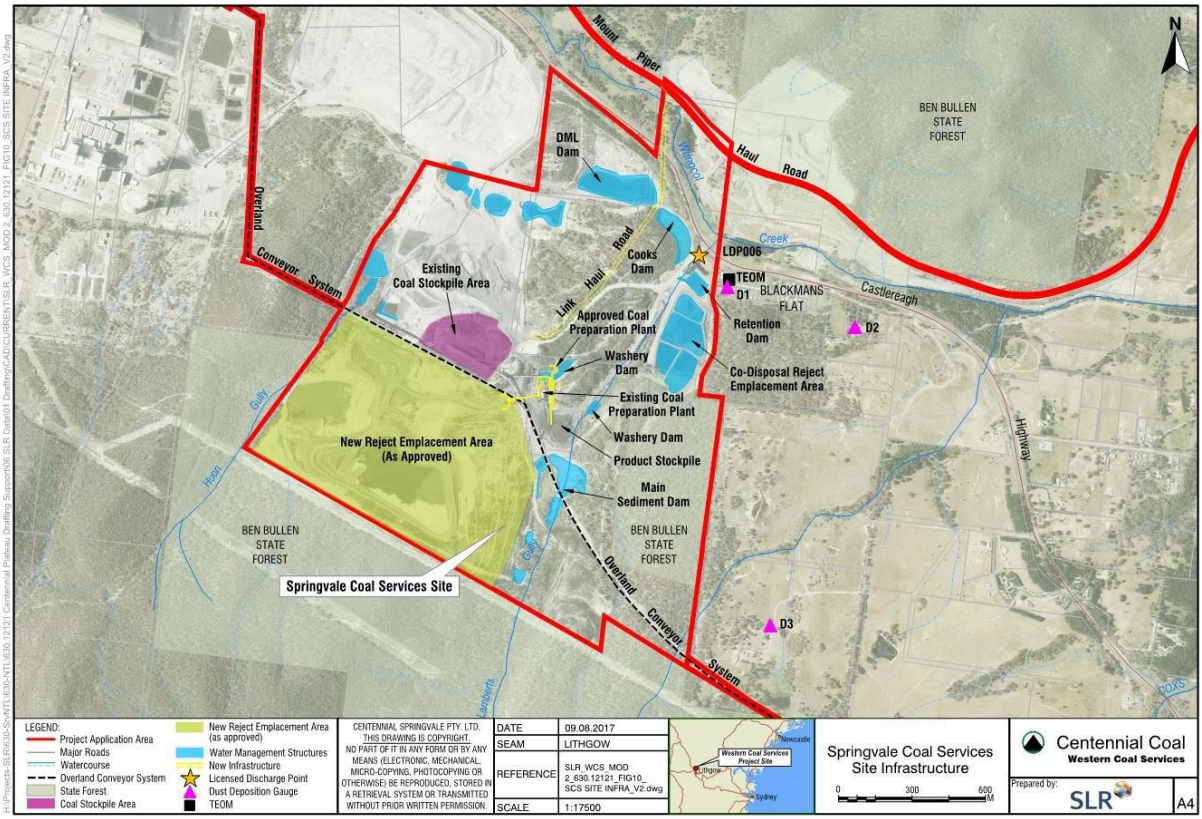
2.2.1 Springvale Coal Services Site and the Overland Conveyor System

The proposed modification elements with the potential to contribute to the air quality impacts of the WCS project are as follows:

- Increase the amount of coal received at the SCSS from the Springvale mine pit top from 4.5 Mtpa to up to 5.5 Mtpa, however it will not increase the total volume of coal handled above the current approved limit of 9.5 Mtpa.
- Require establishment of an 80,000 tonne product stockpile. It is noted that this stockpile already exists but needs to be assessed and approved.

A layout of the SCSS infrastructure is shown in **Figure 2**.

Figure 2 Layout of the Springvale Coal Services Site Infrastructure



2.2.2 Angus Place Colliery

Coal from the Angus Place Colliery can be transported by truck directly to the MPPS via private haul roads and this is undertaken under the WCS Project consent (SSD 5579). Utilisation of this private haul road is limited to 5 loaded trucks per hour between 21:30 and 07:00.

A private Link Haul Road from the Mt Piper Haul Road to the SCSS is approved but not yet constructed. Once constructed, this will allow coal to be transported from the Angus Place Colliery to the SCSS for processing. The locations of these private haul roads are shown in **Figure 2** and **Figure 3**.

The proposed modification will not require any change to the coal transportation systems currently approved in the WCS Project.

Also, it is noted that all operations at the Angus Place Colliery pit top, except for the transfer of the coal from the ROM bin to the haul trucks are not part of the WCS Project. However coal handling at the pit top (refer **Table 5**) was assessed in the PEL report and has been included in this assessment only for consistency.

2.2.3 Springvale Mine Pit Top

An overland conveyor links the Springvale mine pit top to the SCSS, MPPS and Lidsdale Siding. The overland conveyor is approved to transfer up to 4.5 Mtpa of ROM coal from Springvale mine pit top to SCSS, and to MPPS directly or via the SCSS. The location of this overland conveyor is shown in **Figure 1**.

As discussed in **Section 2.2.1**, the proposed modification will increase the quantity of coal received by the WCS Project from the Springvale mine pit top from 4.5 Mtpa to up to 5.5 Mtpa however it will not increase the total volume of coal handled above the current approved limit of 9.5 Mtpa.

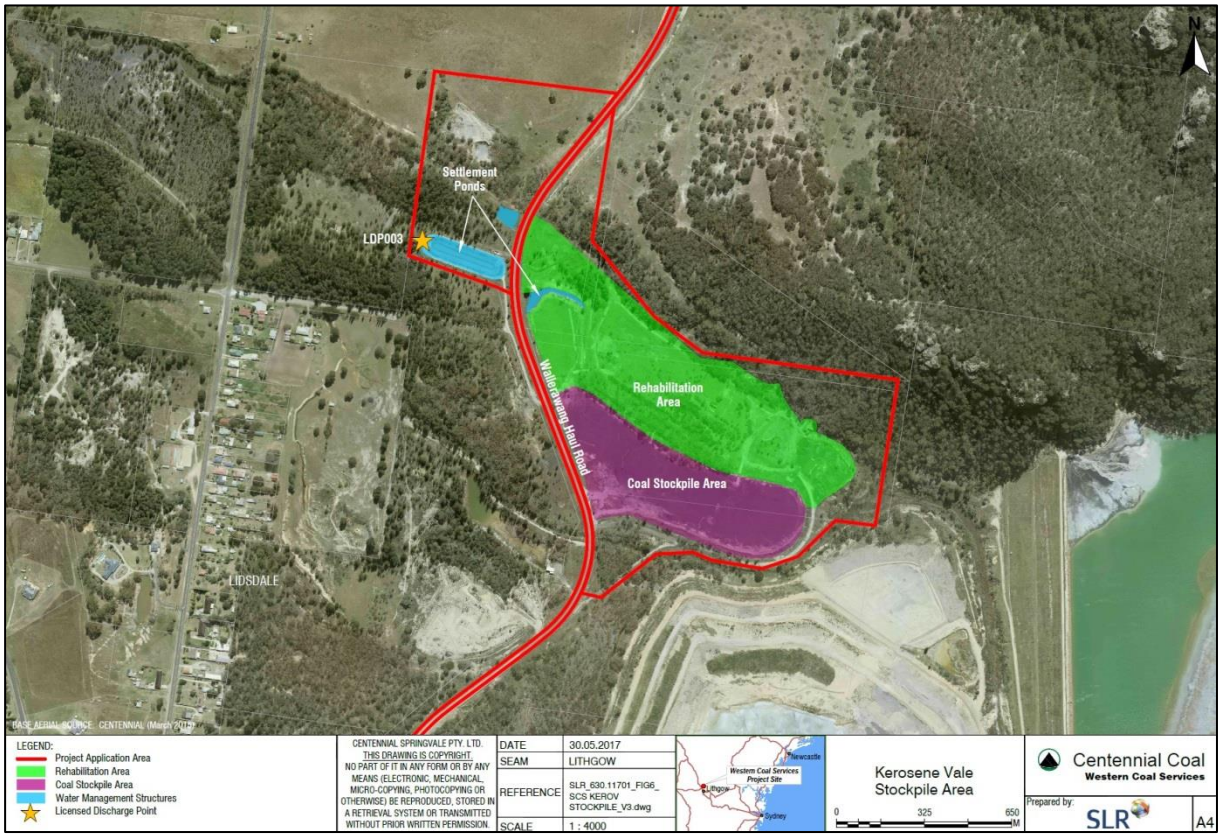
Also, it is noted that all the operations at the Springvale Mine pit top, are not part of the WCS operations except the transfer of coal from crusher and screening plant onto the overland conveyor system. However coal handling at the pit top (refer **Table 5**) was assessed in the PEL report and has been included in this assessment only for consistency.

2.2.4 Kerosene Vale Stockpile Area

Kerosene Vale Stockpile Area provides storage of up to 500,000 tonnes of coal, and is used to temporarily store coal when the power stations are unable to accept coal.

The proposed modification will not result in any changes to the approved coal storage infrastructure at the Kerosene Vale Stockpile Area. A layout of the Kerosene Vale stockpile area infrastructure is shown in **Figure 3**.

Figure 3 Layout of the Kerosene Vale Stockpile Area Infrastructure



2.2.5 Private Haul Roads

The three private haul roads used to transport coal within the Project are:

- Private haul road from Angus Place Colliery pit top to MPPS (Mount Piper haul road);
- Private haul road from Angus Place Colliery pit top to WPS (Wallerawang haul road): and
- Private Link haul road from Mount Piper haul road to the SCSS (approved but not yet constructed).

The proposed modification will not require any change to the private haul roads currently approved in the WCS Project. The locations of these private haul roads are shown in **Figure 2** (Mount Piper Haul Road and Private Link Road) and **Figure 3** (Wallerawang Haul Road).

2.2.6 Summary

A summary of the various WCS Project elements and the respective proposed modifications to the approved operations is shown in **Table 1**.

Table 1 Summary of Western Coal Services Project Elements and Modifications

Project Element	Approved Operations	Proposed Modification
Springvale Coal Services Site	Receive up to 4.5 Mtpa from Springvale Mine	Receive up to 5.5 Mtpa from Springvale Mine
	Receive up to 4 Mtpa from Angus Place Colliery	No change
	Receive up to 1 Mtpa from other sources	No change
	Receive no more than 9.5 Mtpa total ROM coal from all sites	No change
	Process no more than 7.0 Mtpa through the upgraded washery	No change
	Convey no more than 6.3 Mtpa to Lidsdale Siding	No change
	Transport no more than 6.7 Mtpa to domestic power stations	No change
	An existing washery at SCSS capable of processing approximately 2.0 Mtpa	No change
	Upgrade of the existing washery and supporting infrastructure within SCSS, by constructing a new Washery adjacent to the existing facility (that will remain operational) to provide a total processing capacity of up to 7 Mtpa	No change
	150,000 tonne ROM Coal stockpile for washery feed	Additional 80,000 tonne product stockpile
	600,000 tonne additional ROM coal stockpile (for when MPPS cannot take ROM coal)	No change
	Co-Disposal at REA	No change
	New/enlarged REA for disposal of coarse and fine reject material (and incorporates the former 'A' Pit REA within the Lamberts Gully Open Cut void)	No change
	Total reject material storage capacity at SCSS is 12 Mm^3 or 25 Mt (using a compacting density of 2 t/m^3) available over a 25 year project life.	No change
	Transport of up to 1 Mtpa of coarse reject off site using the private haul road network for emplacement within the proposed Neubeck Open Cut (subject to obtaining the necessary approvals)	No change
	Delta Electricity approval for the emplacement of ash over the proposed REA subject to an agreement with Springvale Coal	No change
Private Haul Roads	Mt Piper Haul Road limited to 5 loaded trucks per hour between 21:30 and 07:00.	No change
	Wallerawang Haul Road limited to 5 loaded trucks per hour between 21:30 and 07:00.	No change
	To be constructed private Link Haul Road from the Mt Piper Haul Road to the SCSS.	No change
Overland Conveyor System	4.5 Mtpa of ROM coal approved to be transported from the Springvale Mine pit top to the SCSS using the overland conveyor system.	Coal throughput of 5.5 Mtpa on the conveyor
Kerosene Vale Stockpile Area	500,000 tonne ROM coal stockpile.	No change

2.3 Hours of Operation

The hours of operation for the Project are as follows (Centennial 2016):

- SCSS: 24 hours per day, 7 days per week;
- Kerosene Vale stockpile area: Day period only (7 am – 6 pm);
- Mount Piper haul road: No operations during adverse meteorological conditions during the night period (10 pm – 7 am);
- Wallerawang haul road: No operations during the night period (10 pm – 7 am).

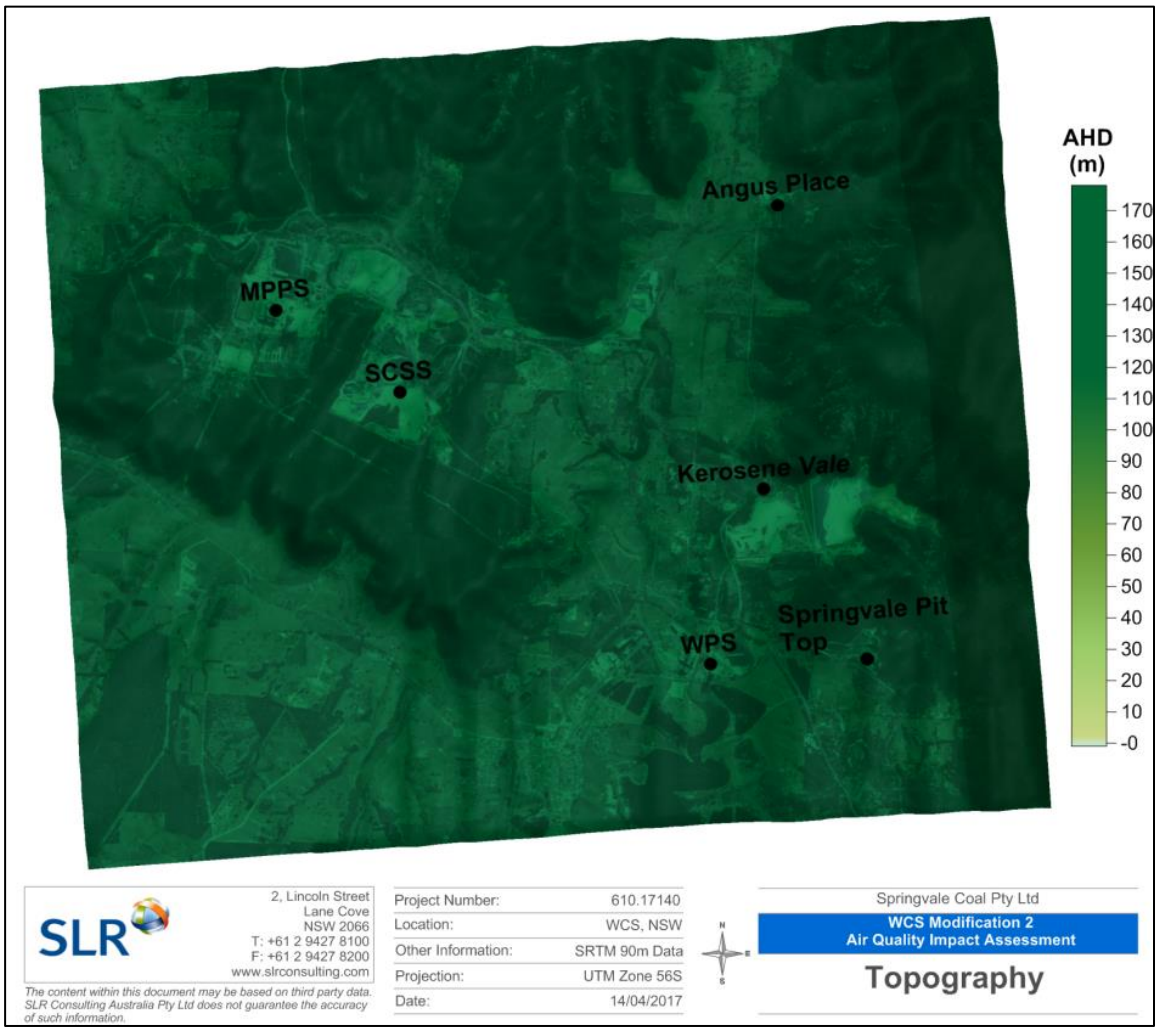
The proposed modification will not change the approved operational hours for the WCS Project.

2.4 Local Topography

The topographical data used in the CALPUFF model was sourced from the United States Geological Service's Shuttle Radar Topography Mission database that has recorded topography across Australia with a 3 arc second (~90 m) spacing.

Figure 4 illustrates the topography of the region surrounding the WCS operations. Elevated terrain exists towards east of Angus Place pit top, Kerosene Vale Stockpile Area, Springvale pit top and towards north and southwest of SCSS. Due to the changes in elevation within the large area covered by the WCS operations, it is concluded that the topography of the region is likely to have a significant impact on the ground level pollutant concentrations at the nearest sensitive receptors. The topographical effects have been included in the dispersion modelling.

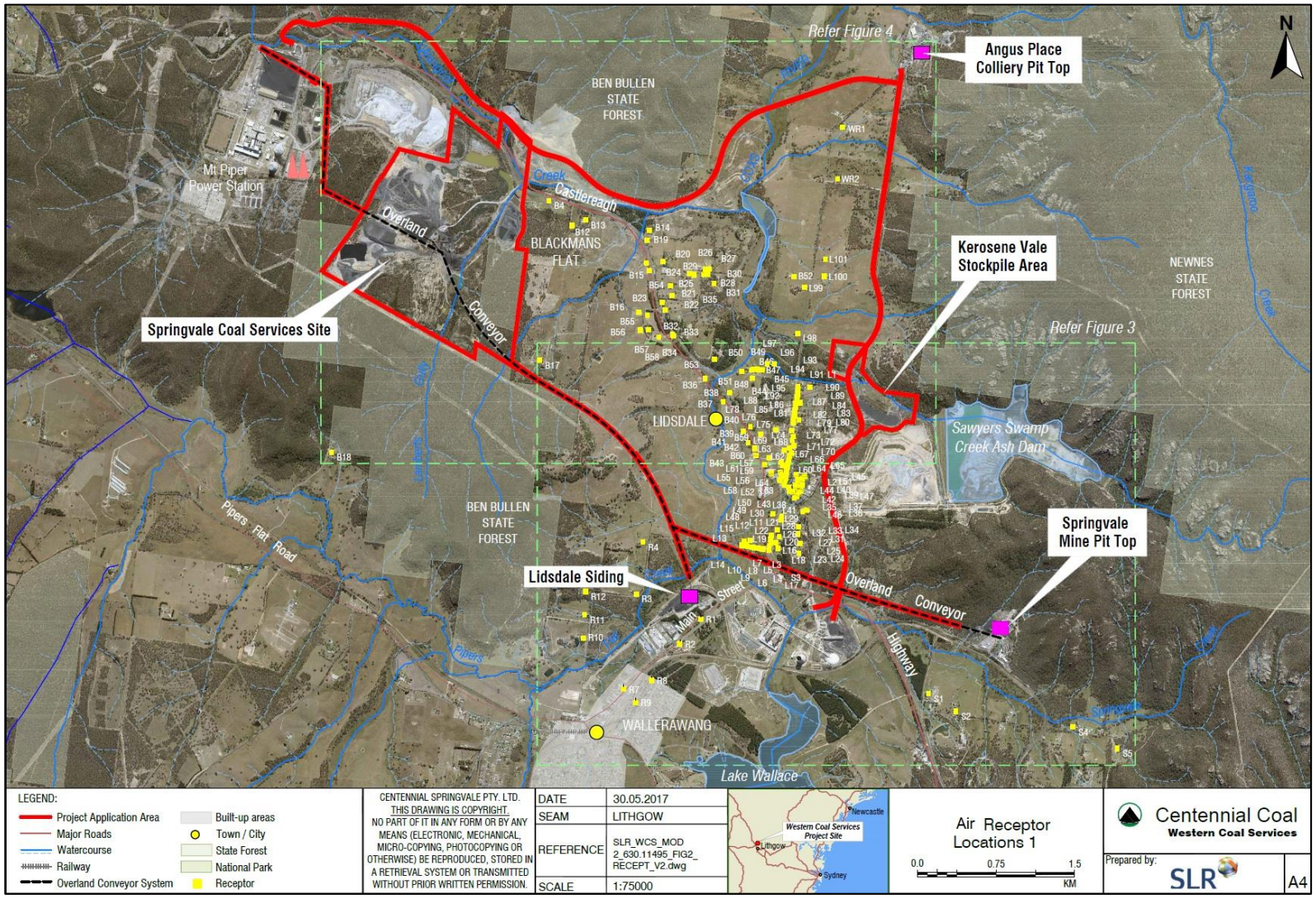
Figure 4 Topography Surrounding the WCS Operations



2.5 Sensitive Receptors

A total of 168 residences have been identified as sensitive receptors in the area surrounding the WCS operations. The locations of the identified sensitive receptors are shown in **Figure 5** and the coordinates of these receptors are listed in **Appendix A**.

Figure 5 Locations of the Identified Nearest Sensitive Receptors



3 AMBIENT AIR QUALITY CRITERIA

The development consent for the WCS Project was granted on 4 April 2014. Under Schedule 4 - Environmental Performance Conditions, the following Air Quality Criteria are specified:

> *The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria in **Table 2** at any residence on privately-owned land.*

Table 2 Air Quality Criteria

Pollutant	Averaging Period	Criteria ($\mu g/m^3$)
PM_{10}	24 hours	50 [a]
	Annual	30 [a,d]
TSP	Annual	90 [a,d]
		Criteria (g/m^2/month)
Deposited dust [c]	Annual	2 [b] (maximum increase in deposited dust level) 4 [a,d] (maximum total deposited dust level)

[a] Cumulative impact (ie increase in concentrations due to the development plus background concentrations due to all other sources).

[b] Incremental impact (ie increase in concentrations due to the development alone, with zero allowable exceedances of the criteria over the life of the development.

[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.

[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Secretary.

Since the development consent was granted, the National Clean Air Agreement (NCAA) was endorsed by Commonwealth, state and territory Environment Ministers on 15 December 2015. Ministers agreed to strengthen national ambient air quality reporting standards for airborne fine particles. All jurisdictions have agreed to implement strengthened standards for particles, as well as move to even tighter standards for annual average and 24-hour $PM_{2.5}$ in 2025.

As such, in February 2016, a variation to the Ambient Air Quality National Environment Protection Measure (NEPM) was made to extend its coverage to $PM_{2.5}$, setting reporting standards for $PM_{2.5}$ with no allowable exceedances (NEPC 2016). In addition, the Ambient Air Quality NEPM revised the standard for annual average PM_{10} to be in line with the NCAA.

These standards have now been adopted by NSW EPA. The updated standards are outlined in the SW EPA document '*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*' (EPA 2017) (hereafter 'the Approved Methods') will be aligned with the Ambient Air Quality NEPM in the near future. Therefore, this assessment is based on the assessment goals set out in the Ambient Air Quality NEPM (2016).

3.1 Summary of Project Air Quality Goals

The air quality goals adopted for this assessment, which conform to current EPA and Federal air quality criteria, are summarised in **Table 3**.

Table 3 Project Air Quality Goals

Pollutant	Averaging Period	Criteria (µg/m^3)	Source
PM_{10}	24 hours	50	EPA 2017
	Annual	25	EPA 2017
$PM_{2.5}$	24 hours	25	EPA 2017
	Annual	8	EPA 2017
TSP	Annual	90	EPA 2017
		Criteria (g/m^2/month)	
Deposited dust	Annual	2 (maximum increase in deposited dust level) 4 (maximum total deposited dust level)	EPA 2017

4 EMISSIONS ESTIMATION

This section describes the approved and proposed (as to be modified in Modification 2) scenarios and the relevant activity data assessed (**Section 4.1**), the emission factors used to estimate emissions from those activities (**Section 4.2**), and the emissions inventory (**Section 4.3**) from the two scenarios.

4.1 Operational Scenarios Assessed

4.1.1 Approved Scenario

As discussed in **Section 1**, this current assessment is based on the scenarios assessed in the PEL report. A total of five operational scenarios were assessed, investigating options for two haul roads (Mount Piper and Wallerawang Haul Roads) existing at the time of the EIS, and two proposed internal link haul road route (Option 1 and Option 2) at the SCSS. Based on the findings of the PEL report, the internal link route 2 option was chosen and the internal link route 1 was scrapped.

For the purpose of this current assessment, the emission inventories compiled in the PEL report for the scenarios related to link route 2 (Scenarios 1b, 2b and 2c) were used in this assessment as the 'Approved' scenario. This approach assumes that all the approved activities are being performed concurrently at their maximum approved capacity which will provide a conservative representation of impacts due to the currently approved WCS operations. It is noted that not all approved activities have been constructed and are operational. In addition, not all existing operations occur concurrently as has been assumed in this assessment.

4.1.2 Modification 2 Scenario

As discussed in **Section 2.2.6**, the following activities are the subject of this modification:

- An increase in the amount of coal that can be received at the SCSS via conveyors from the Springvale Mine from 4.5 Million tonnes per annum (Mtpa) to up to 5.5 Mtpa; and
- Establishment of an 80,000 tonne product coal stockpile (near the washery) within the SCCS.

Therefore, the additional emission sources included as part of this scenario are:

- Loading of the conveyor at Springvale pit top with an additional 1 Mtpa ROM coal;
- Unloading the conveyor at SCSS, with an additional 1 Mtpa ROM coal from Springvale Pit Top; and
- Wind erosion and dozer operations at the additional product stockpile located within the SCSS (~1.1 ha).

It is noted that the handling of additional coal (1 Mtpa) at the Springvale pit top and the SCSS will be done by using the existing fleet of dozers and within the approved hours of operation.

The location of the proposed product stockpile is shown in **Figure 2**.

4.2 Emission Factors

For the approved scenario, the particulate emission rates were adopted as listed in the PEL report (refer **Appendix B**). It was noted in the PEL report that the distribution of particles in each particle size range was assumed to be as follows:

- $PM_{2.5}$ is 4.7% of the TSP;
- $PM_{2.5-10}$ is 34.4% of TSP; and
- PM_{10-30} is 60.9% of TSP.

For the Modification 2 scenario, the particulate emissions for the additional new sources have been calculated using default or calculated emission factors from the National Pollutant Inventory (NPI) *Emission Estimation Technique Manual (EETM) for Mining* version 3.1 (DSEWPC 2012), or from Chapter 13 (Miscellaneous Sources) of the US EPA AP-42 Emission Factor Handbook, where suitable factors do not exist within the NPI documentation.

The emission factors used for the estimation of TSP, PM_{10} and $PM_{2.5}$ emissions from the operational activities are presented in **Table 4**.

Table 4 Summary of Emission Factors Used to Estimate Emissions from Proposed New Sources

Emission Source	Emission Factor Equation	Units	Variables	Source	Controls (Efficiency)
Loading/ Unloading coal from conveyors	$\frac{k \times 0.0016 \times \frac{U}{2.2}^{1.3}}{\frac{M}{2}^{1.4}}$	kg/t	k = 0.74 (TSP) k = 0.35 (PM_{10}) k = 0.053 ($PM_{2.5}$) U = average wind speed (m/s) M = Moisture content (%)	US EPA 2006	No control
Wind erosion	$EF_{TSP} = 0.4$ $EF_{PM10} = 0.2$ $EF_{PM2.5} = 0.0468 \times EF_{TSP}$	kg/ha/h	-	DSEWPC 2012	No control

4.3 Emissions Inventory

A summary of the total estimated TSP emissions for the two scenarios (approved and Modification 2) is listed in **Table 5**. The detailed emission inventory is presented in **Appendix B**.

Table 5 Estimated Annual TSP Emissions from the WCS Project

Activity	Approved (kg/y)[1]	Modification 2 (kg/y)
SCSS		
Unloading conveyer from Springvale (ROM)	848	590
Unloading coal from trucks from Angus Place	135,107	0
Unloading coal from trucks from Neubecks	33,777	0
FEL loading ROM coal to washery	1,319	0
Dozers on coal stockpiles (ROM + product)[2]	32,790	0
Wind erosion on coal stockpiles (ROM + product)	3,154	3,854
Hauling rejects to emplacement areas	48,398	0
Dozers on REA	1,969	0
Trucks dumping on REA	92	0
Hauling coal from Angus Place on new Link Road	29,567	0
Hauling rejects off site on new link road	12,446	0
Hauling coal from Neubecks on new link road	12,446	0
Springvale Pit Top[3]		
Wind erosion on ROM stockpiles	4,205	0
Wind erosion on other exposed areas	2,453	0
Dozers on coal stockpiles	43,720	0
Loading conveyor with additional 1 Mtpa ROM	-	590
Angus Place Colliery[3]		
Loading ROM coal to stockpile (via conveyer)	754	0

Activity	Approved (kg/y)[1]	Modification 2 (kg/y)
Loading ROM coal to truck through chute	754	0
Wind erosion on ROM Stockpiles	1,051	0
Wind erosion on other exposed areas	1,051	0
Dozers on Angus Place stockpile	70,191	0
Kerosene Vale Stockpile Area		
Unloading ROM at Kerosene Vale stockpile	16,843	0
Re-loading ROM at Kerosene Vale stockpile	16,843	0
Dozer on stockpile	14,973	0
Wind erosion on stockpile	5,256	0
Neubecks[3]		
Hauling coal on sealed road to SCSS intersection with new link road	18,439	0
Hauling reject on sealed road from SCSS intersection with new link road	18,439	0
Emissions due to operations (1 Mtpa of ROM, 4 Mbcm of overburden removal, transport and wind erosion)	181,952	0
Angus Place		
Hauling ROM coal on sealed road to MPPS	170,474	0
Hauling ROM coal on sealed road to WPS	118,226	0
Overland Conveyor		
SCSS to Lidsdale Siding	70	16
From Springvale pit top to SCSS and, SCSS to MPPS[4]	30	7
TOTAL	**997,637**	**5,057**

[1] Source: PEL 2013

[2] It is noted that there will be no additional dozers due to this modification, rather the existing fleet will be utilised on the new product stockpile within the approved operational hours for the dozers.

[3] As noted in **Section 2.2.2** and **Section 2.2.3** of this report, these activities are included in the approved scenario of this assessment only because they were assessed in the PEL report. It is noted that these activities do not form part of the WCS Project.

[4] The emissions for the approved scenario have been adopted from the PEL report. It is assumed that these emissions are combined emissions from Springvale pit top to SCSS, and from SCSS to MPPS.

5 AIR DISPERSION MODELLING METHODOLOGY

5.1 Model Selection

Emissions from the WCS operations have been modelled using the CALPUFF (Version 6.267) modelling system. CALPUFF is one of the modelling tools accepted by the NSW EPA. CALPUFF is a transport and dispersion model that breaks emission plumes into “puffs” of material emitted from modelled sources. The model predicts the trajectory of these puffs, simulating dispersion and transformation processes along the way.

In order to model the trajectory and dispersion / transformation of these puffs, the model requires input data on the emissions themselves (location, release times / frequencies, type and strength of the releases), the terrain over which the puffs travel and the meteorological conditions that occur at the location and in the time period under consideration. Both the terrain and meteorological data are in incorporated in three dimensions.

For the meteorological data, CALPUFF typically uses wind field data generated by the meteorological pre-processor CALMET, discussed further below. Temporal and spatial variations in the meteorological fields selected are explicitly incorporated in the resulting distribution of puffs throughout a simulation period. The primary output files from CALPUFF contain either hourly concentrations or hourly deposition fluxes calculated at selected receptor locations. The CALPOST post-processor is then used to process these files, producing tabulations that summarise results of the simulation for user-selected averaging periods.

The advantages of using CALPUFF (rather than using a steady state Gaussian dispersion model such as AERMOD) is its ability to handle calm wind speeds (<0.5 m/s), complicated terrain and cumulative pollution impacts. Steady state models assume that meteorology is unchanged by topography over the modelling domain and may result in significant over or under estimation of air quality impacts.

5.2 Meteorological Data Sensitivity

Meteorological data used in the PEL report (PEL 2013) were based on regional observational data incorporated into the CALMET predictions (generally known as the ‘with obs’ approach). The PEL report modelled a meteorological data year of 2010. In this current assessment the advanced Weather Research and Forecast (WRF) model was used to produce the meteorological field required as an input to the CALMET meteorological model (see **Section 5.4.1**).

Also, the modelled meteorological data and the modelled year (i.e. 2014) used in this assessment are consistent with the meteorological data and modelled year used for other sites within the applicable meteorological domain (i.e. Springvale Mine). Although, no specific guidance is prescribed as to the metrological year to be used in air quality impact assessments, the Approved Methods suggests adopting a ‘representative’ meteorological year within the last five years. The approach taken in this assessment is consistent with the Approved Methods.

Further, the Approved Methods prescribe the use of same background data year to that used for modelled year for contemporaneous analysis. Therefore, the background data used for this assessment is 2014 (see Section **5.6**).

It is noted that due to these differences between the modelling approach between the PEL report and the current assessment (i.e. different meteorological data inputs, different year, and different background dataset), the predicted results showed in the PEL report should not be viewed as directly comparable to those presented in this report.

5.3 Accuracy of Air Dispersion Modelling

Atmospheric dispersion models represent a simplification of the many complex processes involved in the dispersion of pollutants in the atmosphere. To obtain good quality results it is important that the most appropriate model is used and the quality of the input data (meteorological, terrain, source characteristics) is adequate.

The main sources of uncertainty in dispersion models, and their effects, are discussed below.

- **Oversimplification of physics**: This can lead to both under-prediction and over-prediction of ground level pollutant concentrations. Errors are greater in Gaussian plume models as they do not include the effects of non-steady-state meteorology (i.e., spatially- and temporally-varying meteorology).
- **Errors in emission rates**: Ground level concentrations are proportional to the pollutant emission rate. In addition, most modelling studies assume constant worst case emission levels or are based on the results of a small number of stack tests, however operations (and thus emissions) are often quite variable. This is particularly the case for fugitive dust emission sources such as those modelled in this assessment.
- **Errors in source parameters**: Plume rise is affected by source dimensions, temperature and exit velocity. Inaccuracies in these values will contribute to errors in the predicted height of the plume centreline and thus ground level pollutant concentrations. As this study involves emissions of particulate from non-buoyant ground level sources, plume buoyancy factors will be negligible. However, inaccuracies in source location etc can potentially impact on the results of the modelling.
- **Errors in wind direction and wind speed**: Wind direction affects the direction of plume travel, while wind speed affects plume rise and dilution of plume. Errors in these parameters can result in errors in the predicted distance from the source of the plume impact, and magnitude of that impact. In addition, aloft wind directions commonly differ from surface wind directions. The preference to use rugged meteorological instruments to reduce maintenance requirements also means that light winds are often not well characterised.
- **Errors in mixing height**: If the plume elevation reaches 80% or more of the mixing height, more interaction will occur, and it becomes increasingly important to properly characterise the depth of the mixed layer as well as the strength of the upper air inversion. As this study involves emissions of particulate from non-buoyant ground level sources, mixing height errors would not have a significant impact on the accuracy of the results.
- **Errors in temperature**: Ambient temperature affects plume buoyancy, so inaccuracies in the temperature data can result in potential errors in the predicted distance from the source of the plume impact, and magnitude of that impact. As this study involves emissions of particulate from non-buoyant ground level sources, ambient temperature errors would not have a significant impact on the accuracy of the results.
- **Errors in stability estimates**: Gaussian plume models use estimates of stability class, and 3D models use explicit vertical profiles of temperature and wind (which are used directly or indirectly to estimate stability class for Gaussian models). In either case, errors in these parameters can cause either under-prediction or over-prediction of ground level concentrations. For example, if an error is made of one stability class, then the computed concentrations can be off by 50% or more.

The US EPA makes the following statement in its Modelling Guideline (TRC 2011) on the relative accuracy of models:

> *"Models are more reliable for estimating longer time-averaged concentrations than for estimating short-term concentrations at specific locations; and the models are reasonably reliable in estimating the magnitude of highest concentrations occurring sometime, somewhere within an area. For example, errors in highest estimated concentrations of ±10 to 40% are found to be typical, i.e., certainly well within the often quoted factor-of-two accuracy that has long been recognised for these models. However estimates of concentrations that occur at a specific time and site, are poorly correlated with actually observed concentrations and are much less reliable."*

This study utilises the CALPUFF dispersion model in full 3D mode, incorporating the 3D meteorological output from CALMET. The meteorological dataset developed for use in this assessment has been compiled to provide a robust and conservative assessment of potential downwind impacts due to particulate emissions from the WCS operations.

5.4 Meteorological Modelling Methodology

Meteorological mechanisms govern the dispersion, transformation and eventual removal of pollutants from the atmosphere. The extent to which pollution will accumulate or disperse in the atmosphere is dependent on the degree of thermal and mechanical turbulence within the Earth's boundary layer (that layer of the atmosphere closest to the surface of the Earth. Dispersion comprises vertical and horizontal components of motion. The stability of the atmosphere and the depth of the surface-mixing layer define the vertical component. The horizontal dispersion of pollution in the boundary layer is primarily a function of the wind field. The wind speed determines both the distance of downwind transport and the rate of dilution as a result of plume 'stretching'. The generation of mechanical turbulence is similarly a function of the wind speed, in combination with the surface roughness. The wind direction, and the variability in wind direction, determines the general path pollutants will follow, and the extent of crosswind spreading.

Pollution concentration levels therefore fluctuate in response to changes in atmospheric stability, to concurrent variations in the mixing depth, and to shifts in the wind field (Oke 2004). To adequately characterise the dispersion meteorology of the study site, information is needed on the prevailing wind regime, mixing depth and atmospheric stability and other parameters such as ambient temperature, rainfall and relative humidity.

To adequately characterise the dispersion meteorology of the region covered by the WCS Project, information is needed on the prevailing wind regime, ambient temperature, rainfall, relative humidity, mixing depth and atmospheric stability. The meteorology of the region was characterised based on a 3-dimensional prognostic meteorological dataset.

5.4.1 WRF

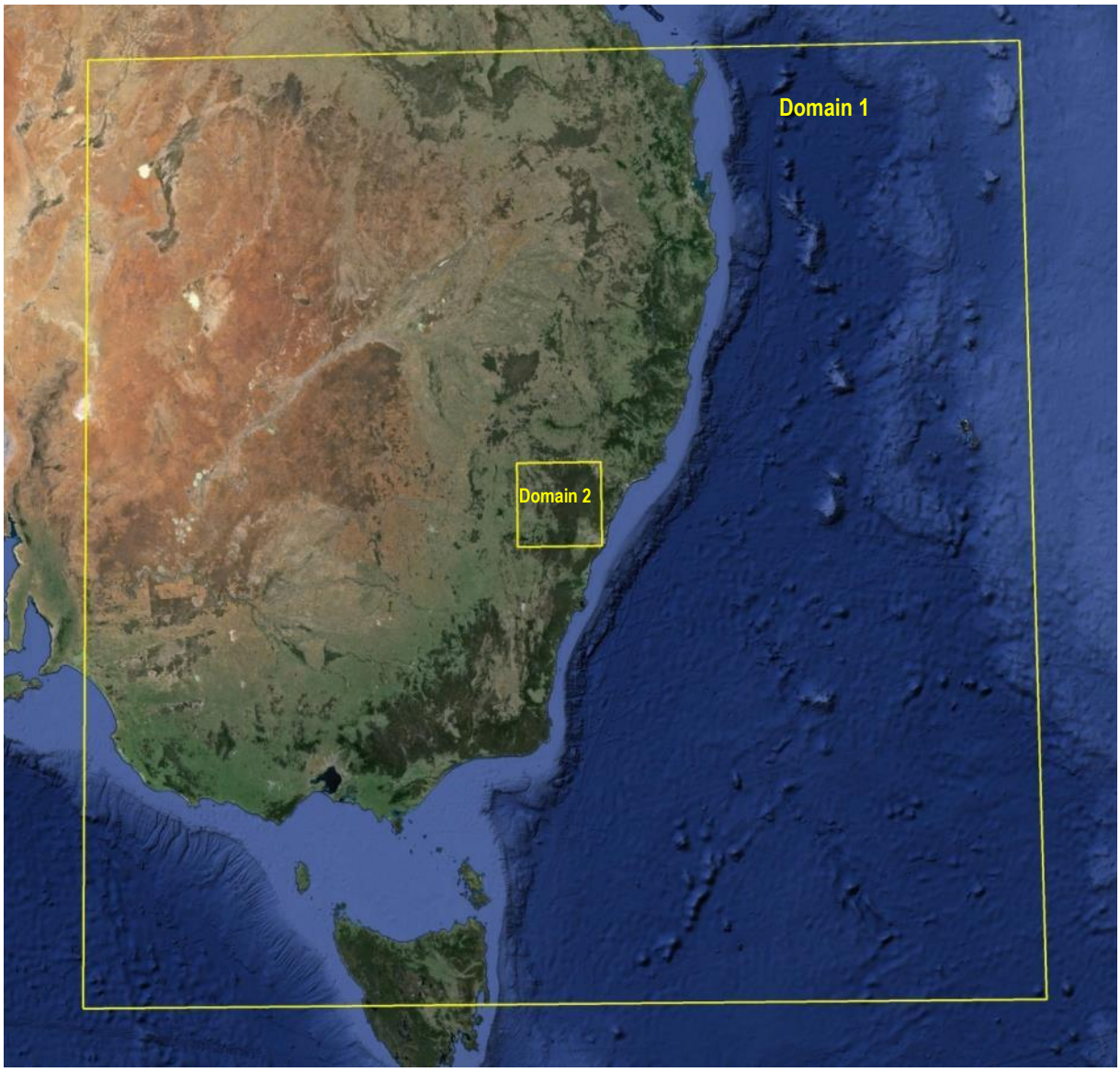
The Weather Research and Forecast (WRF) model is a next generation mesoscale numerical weather prediction system designed for both atmospheric research and operational forecasting needs. It features two dynamical cores; a data assimilation system and a software architecture facilitating parallel computation and system extensibility. The model serves a wide range of meteorological applications across scales from tens of meters to thousands of kilometres.

For this assessment, the WRF modelling system was used to produce the meteorological field required as an input to the CALMET meteorological model over the domains shown in **Figure 6**. Parameters used in the WRF model for this assessment are presented in **Table 6**. Modelling was performed for the 2014 calendar year. This is consistent with the modelled year for the Springvale Mine's SSD 5594 Modification 1 Project (SLR 2016).

Table 6 Meteorological Parameters used for this Study (WRF)

Parameter	Domain 1	Domain 2
Modelling domain	2,100 km × 2,100 km	190 km × 190 km
Grid resolution	30 km	10 km
Number of vertical levels	30	30

Figure 6 WRF Modelling Domains



5.4.2 CALMET

In the simplest terms, CALMET is a meteorological model that develops wind and temperature fields on a three-dimensional gridded modelling domain. Associated two-dimensional fields such as mixing height, surface characteristics and dispersion properties are also included in the file produced by CALMET. The interpolated wind field is then modified within the model to account for the influences of topography, as well as differential heating and surface roughness associated with different land uses across the modelling domain. These modifications are applied to the winds at each grid point to develop a final wind field. The final wind field thus reflects the influences of local topography and land uses.

CALMET modelling was conducted using the nested CALMET approach, where the final results from a coarse-grid run were used as the initial "guess" of a fine-grid run. This has the advantage that off-domain terrain features including slope flows and blocking effects can be allowed to take effect and the larger scale wind flow provides a better start in the fine-grid run.

The outer domain (60 km × 60 km) was modelled with a resolution of 3 km. WRF-generated 3-dimensional meteorological data was used as the initial guess wind field and the local topography and available surface weather observations in the area were used to refine the wind field predetermined by WRF. Hourly surface meteorological data from BoM stations were incorporated in the outer domain modelling.

The output from the outer domain CALMET modelling was then used as the initial guess field for the mid domain CALMET modelling. The mid domain encompasses an area of 28 km × 28 km. A horizontal grid spacing of 1 km was used to adequately represent the important local terrain features and land use.

The output from the mid domain CALMET modelling was then used as the initial guess field for the inner domain CALMET modelling. The inner domain encompassed an area of 16 km × 16 km with a horizontal grid spacing of 200 m to adequately represent the important local terrain features and land use. The fine scale local topography and land use information were used in this run to refine the wind field parameters predetermined by the coarse CALMET run. **Table 7** details the parameters used in the CALMET modelling. The CALMET modelling approach used in this assessment is identified in TRC 2011 as the CALMET Hybrid Mode and is considered to be an 'advanced model simulation'.

Table 7 Meteorological Parameters used in this Assessment (CALMET v 6.42)

Outer Domain	
Meteorological grid	60 km × 60 km
Meteorological grid resolution	3 km
Initial guess filed	3D output from WRF model
Mid Domain	
Meteorological grid	28 km × 28 km
Meteorological grid resolution	1 km
Initial guess field	3D output from 'outer' domain model run
Inner Domain	
Meteorological grid	16 km × 16 km
Meteorological grid resolution	0.2 km
Initial guess field	3D output from 'mid' domain model run

5.5 Meteorological Data Used in Modelling

To provide a summary of the meteorological conditions predicted within the WCS PAA using the methodology described in **Section 5.4**, a single-point, ground-level meteorological dataset was 'extracted' from the 3-dimensional dataset at the SCSS and is presented in this section. It is noted that the wind conditions used in the modelling at other WCS operations within the modelling domain may be different to those predicted at the SCSS site. The data has been presented here for the SCSS operations only, as it is the common link site between all the WCS operations.

5.5.1 Wind Speed and Direction

A summary of the annual wind behaviour predicted by CALMET for the SCSS site for the year 2014 is presented as wind speed frequency chart in **Figure 7** and wind roses in **Figure 8**.

Wind roses show the frequency of occurrence of winds by direction and strength. The bars correspond to the 16 compass points (degrees from north). The bar at the top of each wind rose diagram represents winds blowing from the north (i.e. northerly winds), and so on. The length of the bar represents the frequency of occurrence of winds from that direction, and the widths of the bar sections correspond to wind speed categories, the narrowest representing the lightest winds. Thus it is possible to visualise how often winds of a certain direction and strength occur over a long period, either for all hours of the day, or for particular periods during the day.

The wind speed frequency chart indicates that the SCSS site predominantly experiences light winds (less than 5.5 m/s), for approximately 79% of time.

The wind roses indicate that the predominant wind direction is seasonally dependent. Calm wind conditions (wind speed less than 0.5 m/s) were predicted to occur less than 1% of the time during the year.

The seasonal wind roses for the year 2014 indicate that:

- In summer, winds were predominantly light to moderate (between 0.5 m/s and 8 m/s) from between north-northeast and southeast directions. The calms were predicted for approximately 1% of the time during the summer months.
- In autumn, winds were predominantly light to moderate (between 0.5 m/s and 8 m/s) from west-northwest and south-southeast directions. The calms were predicted to occur less than 1% of the time during autumn months.
- In winter, winds were predominantly light to fresh (between 0.5 m/s and 10.5 m/s) from between the west-northwest and southeast directions with very few winds from between the north and east directions. The calms were predicted to occur less than 1% of the time during winter months.
- In spring, winds were predominantly light to moderate (between 0.5 m/s and 8 m/s) from between the northwest and south-southwest directions. The calms were predicted to occur less than 1% of the time during spring months.

Figure 7 Wind Speed Frequency Chart for the SCSS Site (CALMET predictions, 2014)

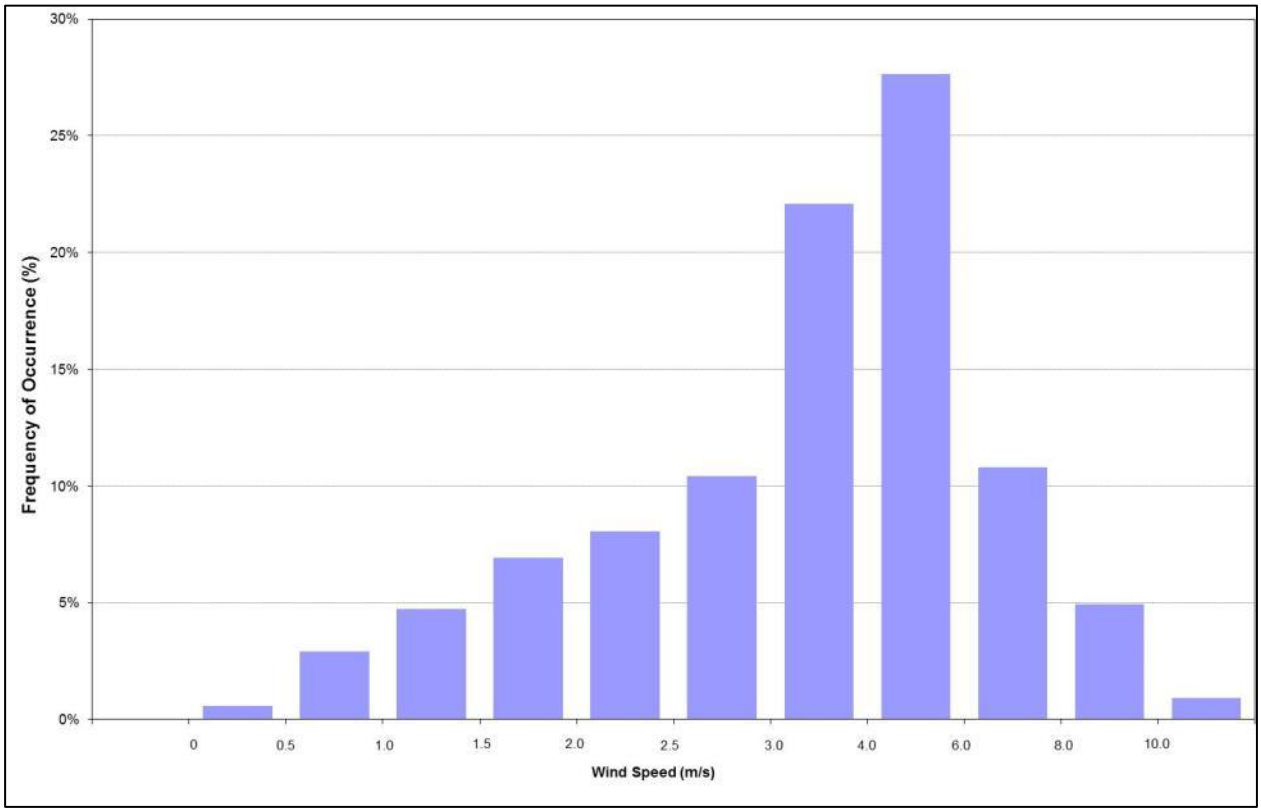
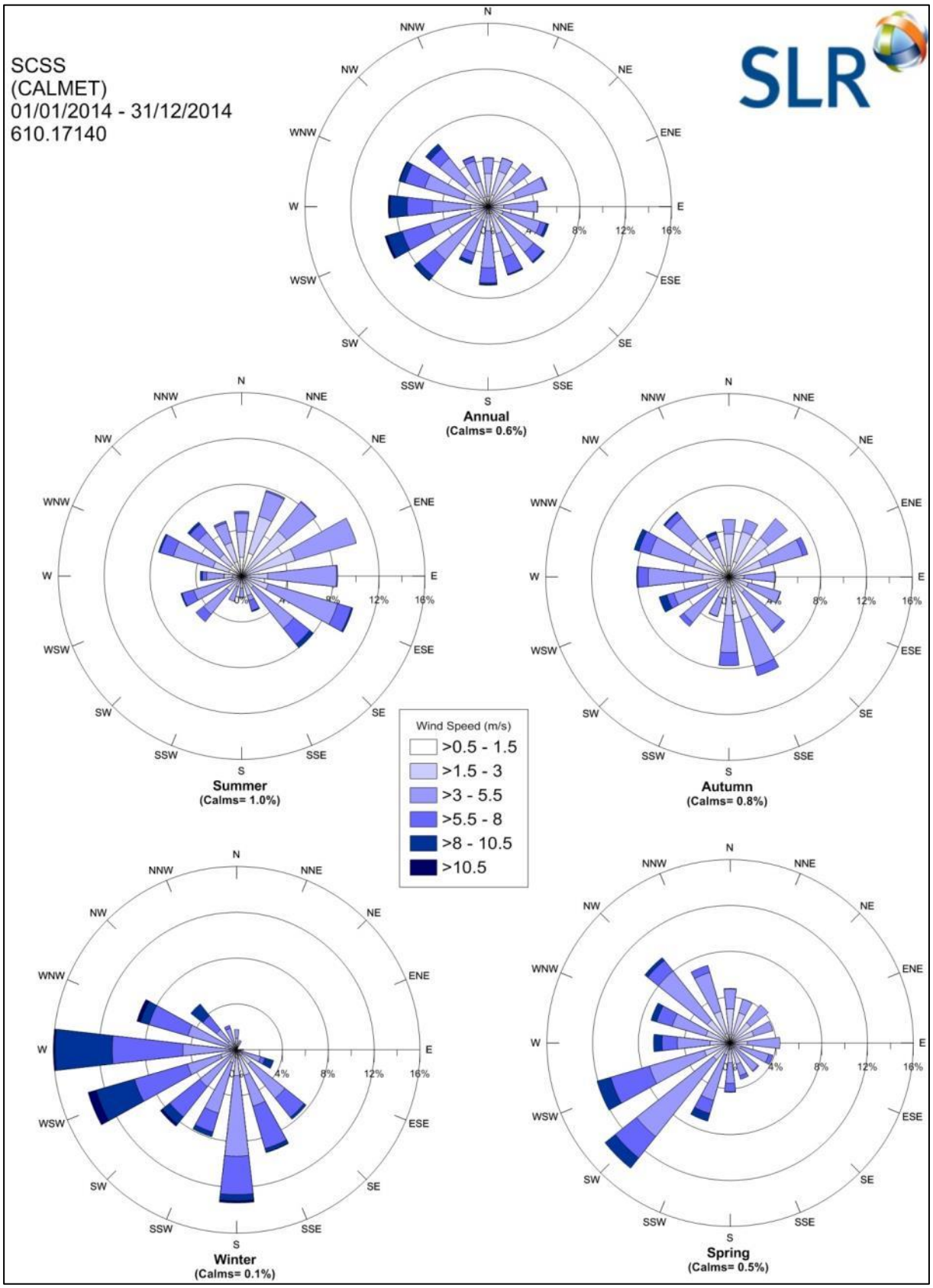


Figure 8 Annual Wind Roses for the SCSS Site (CALMET predictions, 2014)



5.5.2 Atmospheric Stability

Atmospheric stability refers to the tendency of the atmosphere to resist or enhance vertical motion. The Pasquill-Turner assignment scheme identifies six Stability Classes, A to F, to categorize the degree of atmospheric stability as follows:

- A = Extremely unstable conditions
- B = Moderately unstable conditions
- C = Slightly unstable conditions
- D = Neutral conditions
- E = Slightly stable conditions
- F = Moderately stable conditions

The meteorological conditions defining each Pasquill stability class are shown in **Table 8** .

Table 8 Meteorological Conditions Defining Pasquill Stability Classes (Source: Pasquill, 1961)

Surface wind speed (m/s)	Daytime insolation			Night-time conditions	
	Strong	Moderate	Slight	Thin overcast or > 4/8 low cloud	≤ 4/8 cloudiness
< 2	A	A - B	B	E	F
2 - 3	A - B	B	C	E	F
3 - 5	B	B - C	C	D	E
5 - 6	C	C - D	D	D	D
> 6	C	D	D	D	D

Notes:

[1] Strong insolation corresponds to sunny midday in midsummer in England; slight insolation to similar conditions in midwinter.

[2] Night refers to the period from 1 hour before sunset to 1 hour after sunrise.

[3] The neutral category D should also be used, regardless of wind speed, for overcast conditions during day or night and for any sky conditions during the hour preceding or following night as defined above.

The results indicate a high frequency of conditions typical to Stability Class D and F, for the SCSS.

Stability Class D is indicative of neutral conditions, conducive to a moderate level of pollutant dispersion due to mechanical mixing. Stability Class F is indicative of stable night time conditions, which will inhibit pollutant dispersion resulting in higher pollutant concentrations at ground level at surrounding areas.

5.5.3 Mixing Heights

Diurnal variations in maximum and average mixing depths predicted by CALMET at SCSS during 2014 are illustrated in **Figure 10**. As would be expected, an increase in the mixing depth during the morning is apparent, arising due to the onset of vertical mixing following sunrise. Maximum mixing heights occur in the mid to late afternoon, due to the dissipation of ground-based temperature inversions and the growth of the convective mixing layer.

Figure 9 Stability Class Frequencies at the SCSS Site (CALMET predictions, 2014)

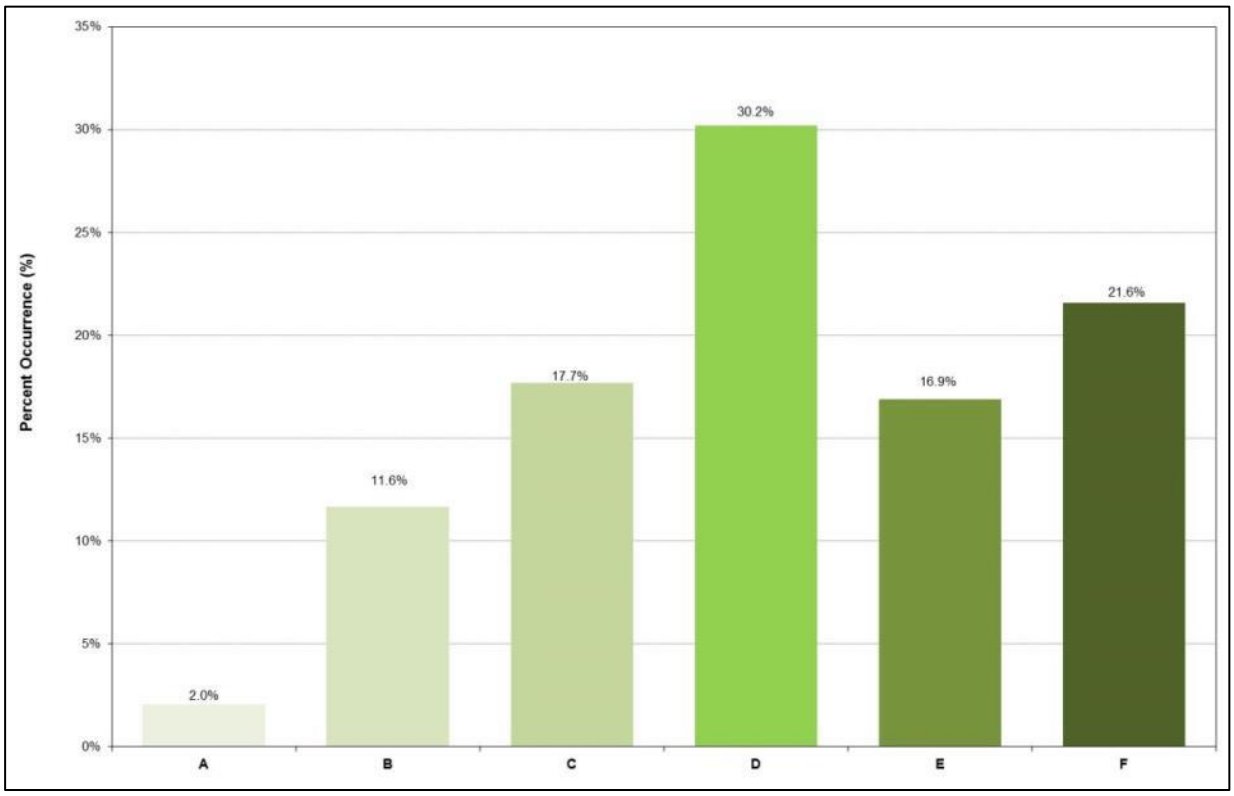
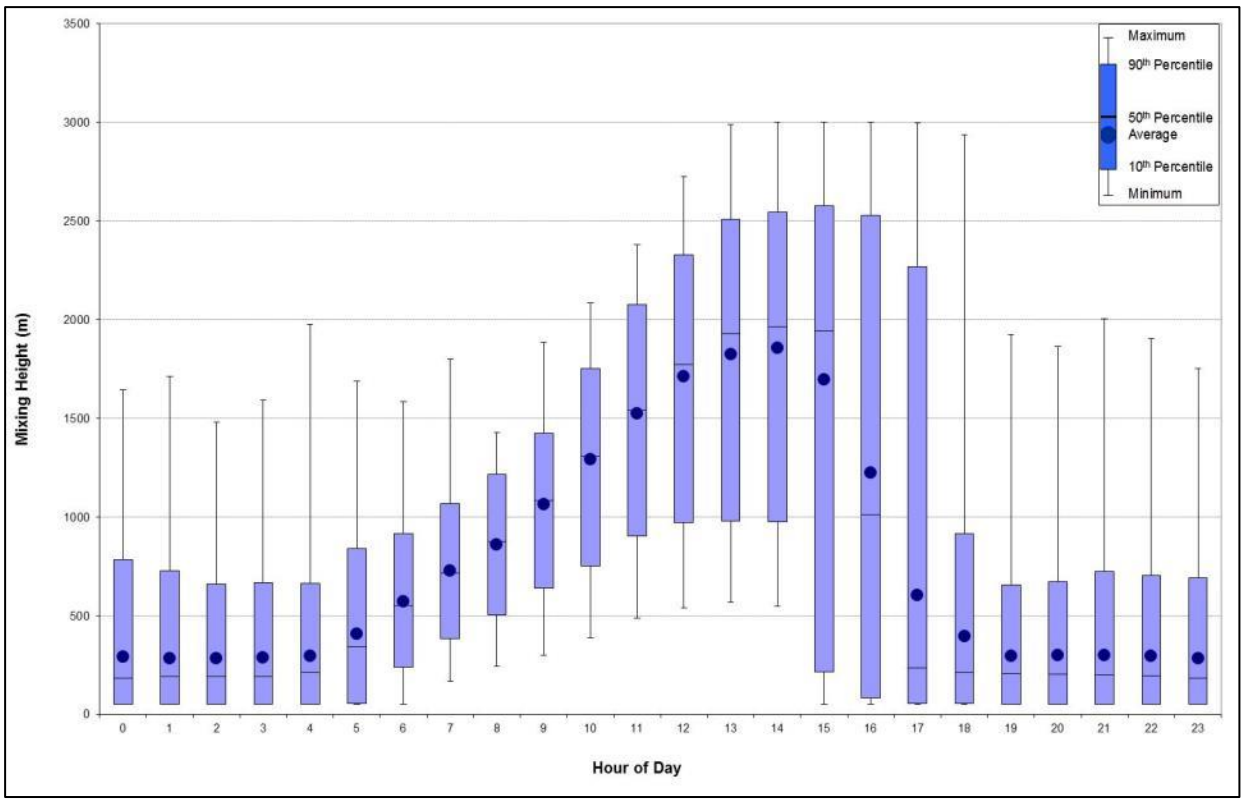


Figure 10 Mixing Heights at the SCSS Site (CALMET predictions, 2014)



5.6 Existing Air Quality Environment

5.6.1 WCS Ambient Air Quality Monitoring Data

Air quality monitoring for the WCS operations is conducted as per the Air Quality and Greenhouse Gas Management Plan for Western Region (Centennial 2016a). Air quality monitoring data is available from the following:

- Three (3) dust deposition gauges (D1 – D3) (Pine Dale Coal Mine), data available from December 2005 to February 2015;
- Co-located High Volume Air Samplers (HVAS) for TSP and PM_{10}, located in Blackmans Flat, opposite Pine Dale Mine; data available from December 2005 to August 2016; and
- Tapered Element Oscillating Microbalance (TEOM) measuring PM_{10} in Blackmans Flat near the B4 receptor, data available from December 2015 onwards.

The location of these air quality monitors is shown in **Figure 2**, and are located in close proximity to the SCSS (TEOM, three dust deposition gauges D1-D3, co-located HVAS) in Blackmans Flat.

Data from dust deposition gauges D1 – D3 were used as background dust levels for consistency with the PEL report. The WCS operations also monitor dust deposition rate from three other dust gauges located in Blackmans Flat (DG5) and within Springvale Coal Services Site (DG3 and DG4).

The relevant monitoring data from the dust gauges, HVAS and TEOM listed above are shown in **Figure 11**, **Figure 12** and **Figure 13** respectively and a summary is shown in **Table 9**.

Figure 11 Annual Average Dust Deposition Data for WCS Operations

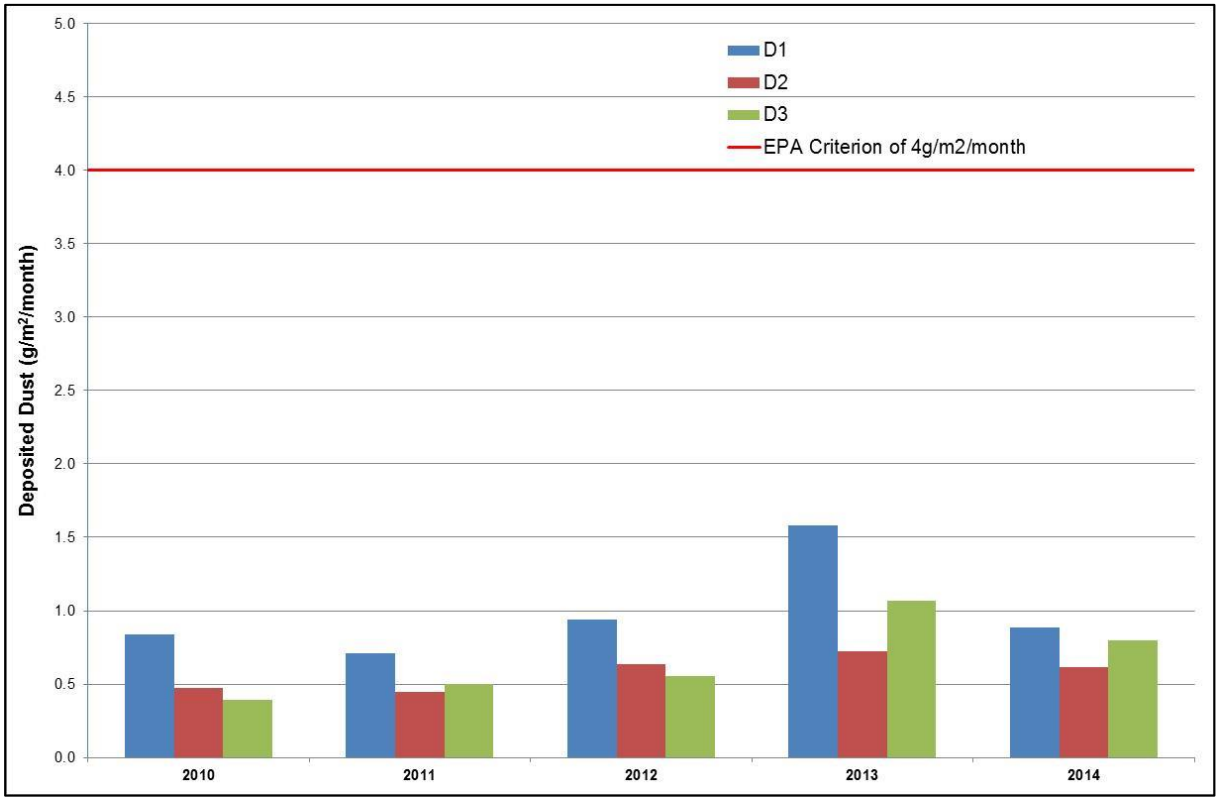


Figure 12 HVAS Data for WCS Operations – 2014

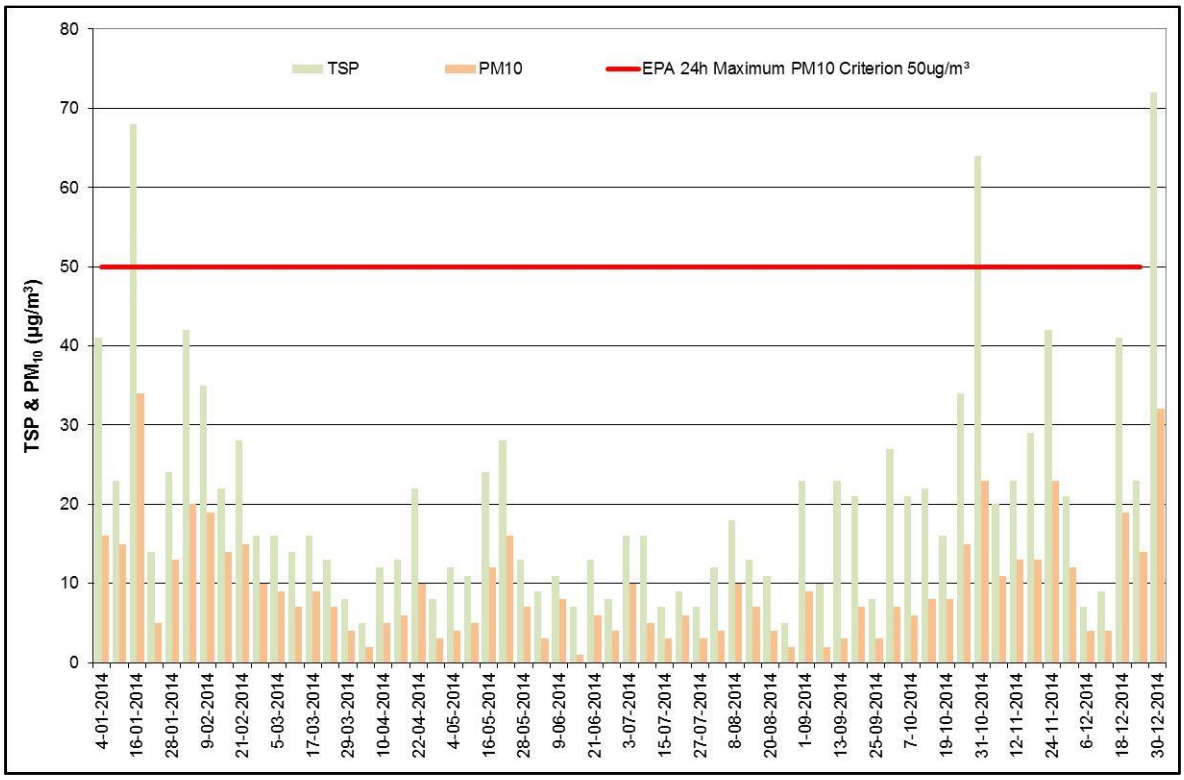


Figure 13 TEOM Data for WCS Operations - 2016

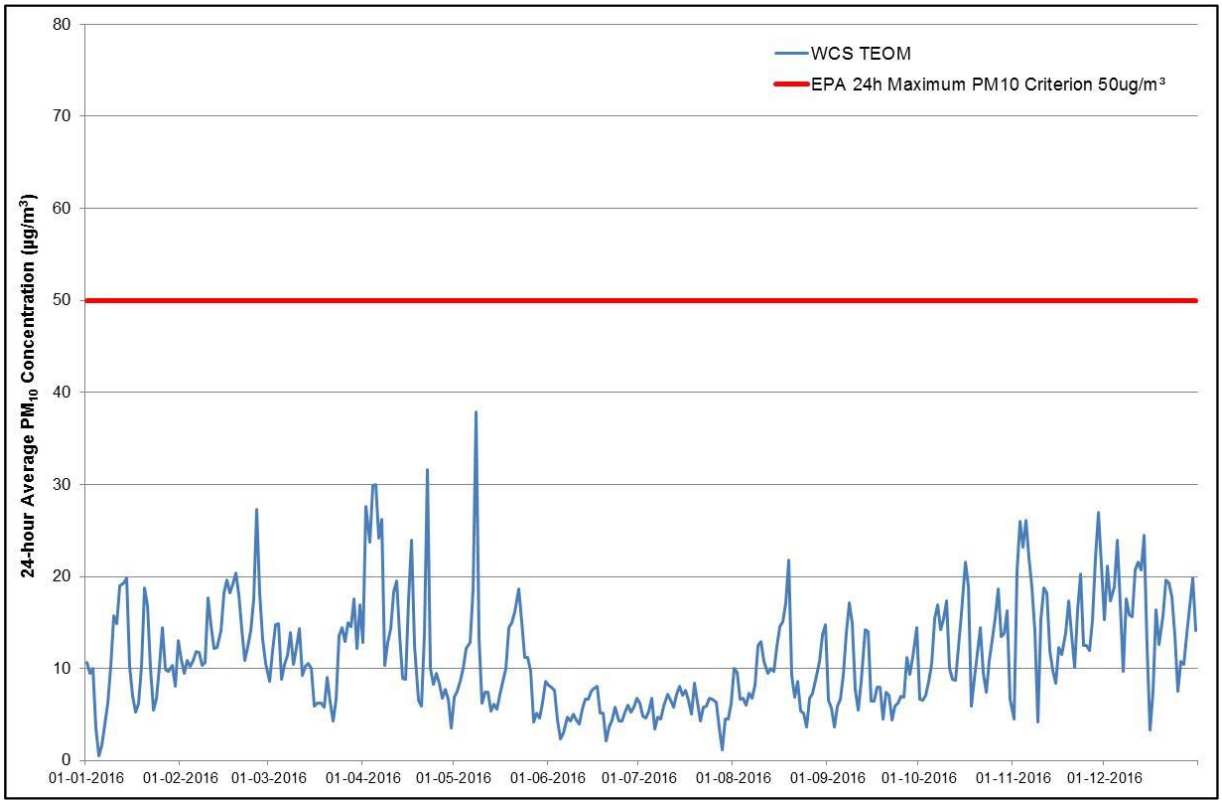


Table 9 Summary of the Air Quality Monitoring for WCS Operations

Parameter	Period	Value	Units	Notes
Dust Deposition	19 December 2013 to 16 December 2014	0.9	g/m^2/month	Maximum of D1, D2 & D3
TSP (HVAS)	4 January 2014 to 30 December 2014	20.4	$\mu g/m^3$	Annual average
PM_{10} (HVAS)	4 January 2014 to 30 December 2014	34	$\mu g/m^3$	Maximum 24-hour average
		9.5	$\mu g/m^3$	Annual average
PM_{10} (TEOM)	1 January 2016 to 31 December 2016	37.8	$\mu g/m^3$	Maximum 24-hour average
		11.3	$\mu g/m^3$	2016 Annual average
Ratio of TSP (HVAS): PM_{10} (HVAS)	4 January 2014 to 30 December 2014	2.2	-	-

5.6.2 Background Data for Assessment Purposes

The main focus of this report is the assessment of the potential impacts of Modification 2 on the closest sensitive receptors (see **Section 2.5**). The purpose of assessing background air quality is to determine the concentrations of air pollutants currently experienced at these residences, with the predicted concentrations from the WCS operations and the modification added to these background concentrations to identify the likely future cumulative air quality impacts. The background data adopted in this assessment is discussed in the following sections.

5.6.2.1 Deposited Dust

The deposited dust background level is adopted from the dust deposition rates recorded in the vicinity of the WCS operations, of 0.9 g/m^2/month (i.e. maximum annual average recorded by any gauge during 2014).

5.6.2.2 PM_{10}

For Level 2 assessments, the Approved Methods requires the use of *"ambient monitoring data that includes at least one year of continuous measurements and is contemporaneous with the meteorological data used in the dispersion modelling".*

From **Table 9**, it can be seen that WCS TSP and PM_{10} HVAS data are available for the same year as the modelled meteorological year (2014), however this is not continuous data and is instead based on a 1-day-in-6 monitoring cycle. Continuous ambient PM_{10} monitoring data from the TEOM are not available before 22 December 2015.

Therefore, in the absence of continuous site-specific background ambient air quality data for the same year as the modelled year, the approach adopted for this assessment is to use data from the nearest OEH monitoring station measuring continuous PM_{10} concentrations, which is located in Bathurst, approximately 50 km northwest of the WCS operations. This is the same approach as that used in the Springvale Mine's SSD 5594 Modification 1 AQIA (SLR 2016).

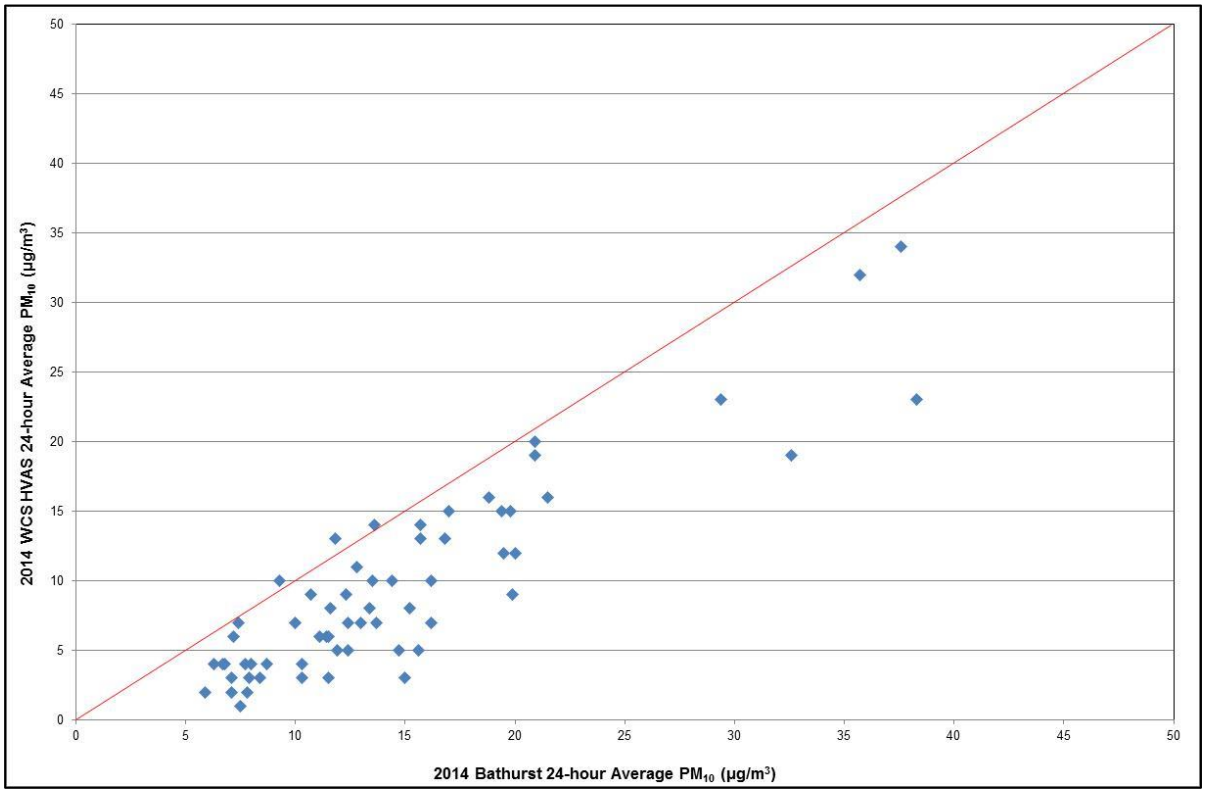
It is recognised that local dust-generating activities surrounding the WCS operations and Bathurst are significantly different. Mining, coal processing activities and Mount Piper Power Station are the key local potential suspended particulate sources in the area surrounding the largest WCS project component, the SCSS operations. Residential activities (such as lawn mowing, wood heaters), manufacturing and other non-mining industrial activities, and vehicle emissions are likely to be the predominant sources of suspended particulate in the Bathurst area. Since the intensity and type of potential dust generating activities at Bathurst and the area surrounding WCS operations are different, further investigations have been carried out to assess the sensitivity of the modelling results to the use of ambient monitoring data from the OEH-operated Bathurst monitoring site.

Figure 14 presents a comparison of the contemporaneous 24-hour average PM_{10} concentrations measured at Bathurst and by the WCS HVAS during 2014, while **Figure 15** presents a similar comparison of the 24-hour average PM_{10} concentrations measured at Bathurst and by the WCS TEOM during 2016.

It can be observed from **Figure 14** that PM_{10} concentrations measured by the WCS HVAS were consistently lower than those measured by the Bathurst monitoring station during 2014. **Figure 15** indicates that the WCS TEOM also tended to measure PM_{10} concentrations lower than those recorded at Bathurst. It is also noted that the monitoring data from the WCS HVAS and WCS TEOM will include the impact of dust emissions from the existing operations at SCSS and therefore is a conservative measure of actual background levels for the entire WCS operations given the project has a large footprint, and comprises other components, namely Mount Piper and Wallerawang Haul Roads, Kerosene Vale Stockpile Area and the overland conveyor system traversing from the Springvale Mine pit top to MPPS.

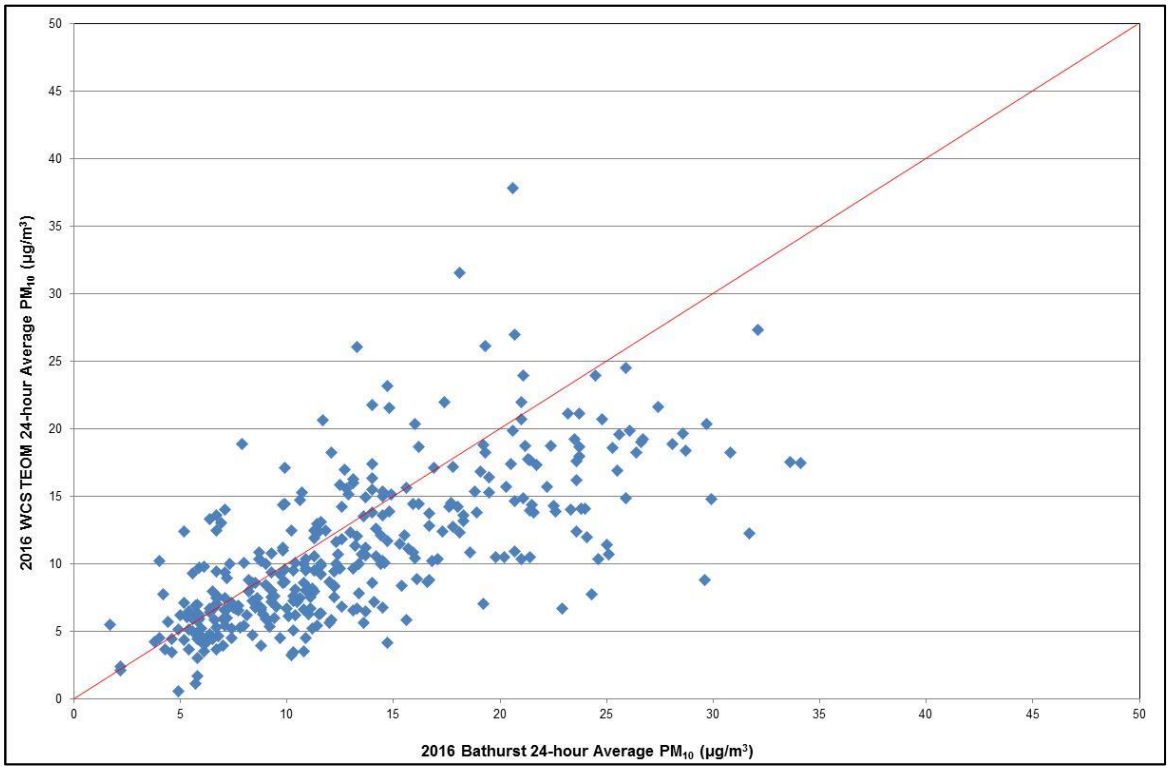
Based on the comparisons shown in **Figure 14** and **Figure 15** and the absence of contemporaneous continuous site specific background data, the use of continuous ambient monitoring data from Bathurst is concluded to be a conservative and appropriate approach for the assessment of potential cumulative impacts for the WCS operations. A sensitivity analysis is presented in **Section 6.5** to assess the impact of this approach on the findings of the assessment.

Figure 14 Bathurst PM_{10} (2014) versus WCS HVAS PM_{10} Data (2014)



Note: Red line denotes 1:1 relationship

Figure 15 Bathurst PM_{10} (2016) versus WCS TEOM PM_{10} Data (2016)



Note: Red line denotes 1:1 relationship

5.6.2.3 TSP

The annual average background TSP concentration was estimated based on the annual average PM_{10} concentrations recorded at Bathurst in 2014 and the TSP to PM_{10} ratio derived from the WCS HVAS data (see **Table 9**).

5.6.2.4 $PM_{2.5}$

No ambient background monitoring data for $PM_{2.5}$ are available in the local area or at nearest OEH monitoring sites. Therefore a background $PM_{2.5}$ dataset cannot be compiled for use within this assessment and comparison of the incremental concentrations to the criteria has been performed.

5.6.3 Other Industrial Sources in the Region

Given that the continuous particulate monitoring data obtained from the Bathurst OEH site is clearly shown in **Section 5.6.2** to be a conservative estimation of the actual particulate environment (as monitored) surrounding WCS operations, it can be confidently considered that the following existing activities and projects located in the area surrounding the WCS operations are taken into account within this assessment:

- Springvale Mine Pit Top;
- Mount Piper Power Station (including associated infrastructure such as coal stockpiles and ash dams);
- Existing Lidsdale Siding Coal Loading facility;
- Wallerawang Power Station (decommissioned, fugitive emissions from exposed areas);
- Existing Angus Place Colliery (currently under care and maintenance);
- Pine Dale Coal Mine (currently under care and maintenance);

5.6.4 Summary

The adopted background data are presented in **Table 10**.

Table 10 Summary of the Adopted Background Data

Pollutant	Averaging Period	Value (µg/m³)	Basis
PM_{10}	24-hours	Daily varying	Monitoring data at Bathurst (2014) Maximum 24-hour average of 42.8 µg/m^3
	Annual	14.6	Monitoring data at Bathurst (2014)
TSP	Annual	32.1	TSP to PM_{10} ratio of 2.2 (based on monitored data from WCS HVAS)
Dust Deposition	Annual	0.9 g/m^2/month	Maximum of dust deposition monitoring data recorded at WCS dust gauges in 2014

6 AIR DISPERSION MODELLING RESULTS

Dispersion modelling predictions of dust deposition rates and TSP, PM_{10} and $PM_{2.5}$ concentrations at the residences/properties nominated in **Section 2.5** attributable to the WCS operations are presented in **Section 6.1** to **Section 6.4**. As noted in **Section 2.5**, a total of 168 sensitive receptors were included in the modelling, however the results for the top twelve worst impacted receptors plus additional representative receptors are only presented in the following sections.

Pollutant isopleth plots are also provided in **Appendix C** which show the maximum predicted incremental concentrations and deposition rates due to the WCS operations (Approved + Modification 2) of the pollutants (TSP, PM_{10} and $PM_{2.5}$ and dust deposition) assessed.

For the predicted dust deposition rates and predicted concentrations of TSP, PM_{10} and $PM_{2.5}$ presented in **Table 12** to **Table 18**, several values are presented. The values presented and an explanation of each is provided in **Table 11**.

Table 11 Results Presentation and Explanation

Description in Results Tables	Data Presented	Reason for Presentation
Increment Approved Operations	Maximum incremental contribution from the approved WCS Project	Identifies the maximum impacts predicted over the entire year from the approved WCS operation sources only
Increment Modification 2	Maximum incremental contribution from this modification (Modification 2)	Identifies the maximum impacts predicted over the entire year from the modification components of WCS operations only
Total Increment[1] (Approved Operations + Modification 2)	Maximum incremental contribution from the approved WCS operations and Modification 2	Identifies the maximum impacts predicted over the entire year from the approved WCS operation sources and modification components are added together
Cumulative Background + Approved Operations[2]	Maximum cumulative concentration from approved operations	Indicates the maximum predicted particulate concentration when regional background and approved operations sources are added together
Cumulative Background + Approved Operations + Modification 2	Maximum cumulative concentration (ALL SOURCES)	Indicates the maximum predicted particulate concentration when regional background, approved operations and Modification 2 sources are added together

[1] These values are only presented in **Table 17** and **Table 18**, due to the lack of background data for $PM_{2.5}$.

[2] These values are only presented in **Table 14**, to further illustrate the minor contribution of Modification 2 operations only within the cumulative impacts.

6.1 Dust Deposition

Table 12 shows the results of the updated dispersion modelling for dust deposition from the WCS operations at the top twelve worst impacted identified sensitive receptors (B04, B12 – 14, B19, L023 – L027, L031, S1, S2) and additional representative receptors (S3 to S5, WR1, WR2 and B16).

Table 12 Predicted Annual Average Dust Deposition Rates

Receptor ID	Annual Average Dust Deposition Rate (g/m^2/month)			
	(Increment) Approved Operations	(Increment) Modification 2	Background (Table 10)	(Cumulative) Background + Approved + Modification 2
B04	0.5	<0.1	0.9	<1.5
B12	0.3	<0.1	0.9	<1.3
B13	0.3	<0.1	0.9	<1.3
B14	0.3	<0.1	0.9	<1.3
B19	0.2	<0.1	0.9	<1.2
L023	0.2	<0.1	0.9	<1.2
L024	0.2	<0.1	0.9	<1.2
L025	0.2	<0.1	0.9	<1.2
L027	0.2	<0.1	0.9	<1.2
L031	0.2	<0.1	0.9	<1.2
S1	0.2	<0.1	0.9	<1.2
S2	0.2	<0.1	0.9	<1.2
S3	<0.1	<0.1	0.9	<1.1
S4	<0.1	<0.1	0.9	<1.1
S5	<0.1	<0.1	0.9	<1.1
WR1	0.1	<0.1	0.9	<1.1
WR2	0.1	<0.1	0.9	<1.1
B16	0.1	<0.1	0.9	<1.1
Criterion	**2.0**	**2.0**	**-**	**4.0**

The results indicate that incremental and cumulative annual average dust deposition rates at the nominated residences/properties surrounding the WCS operations 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).

6.2 TSP

Table 13 presents the annual average TSP concentrations predicted by the dispersion modelling at the top twelve worst impacted identified sensitive receptors (B04, B12 – 14, B19, L023 – L027, L031, S1, S2) and additional representative receptors (S3 to S5, WR1, WR2 and B16).

The results indicate that cumulative annual average TSP concentrations are predicted to be well below the criterion of 90 $\mu g/m^3$ at all identified sensitive receptor locations.

Table 13 Predicted Annual Average TSP Concentrations

Receptor ID	Annual Average TSP Concentration (µg/m^3)			
	(Increment) Approved Operations	(Increment) Modification 2	Background (Table 10)	(Cumulative) Background + Approved + Modification 2
B04	10.8	0.1	32.1	43.0
B12	8.4	0.1	32.1	40.6
B13	8.7	<0.1	32.1	<41.0
B14	7.0	<0.1	32.1	<39.2
B19	6.4	<0.1	32.1	<38.6
L023	4.6	<0.1	32.1	<36.8
L024	5.9	<0.1	32.1	<38.1
L025	6.0	<0.1	32.1	<38.2
L027	6.1	<0.1	32.1	<38.3
L031	6.3	<0.1	32.1	<38.5
S1	5.8	<0.1	32.1	<38.0
S2	6.0	<0.1	32.1	<38.2
S3	2.9	<0.1	32.1	<35.1
S4	1.2	<0.1	32.1	<33.4
S5	0.8	<0.1	32.1	<33.0
WR1	7.2	<0.1	32.1	<39.5
WR2	6.3	<0.1	32.1	<38.5
B16	2.9	<0.1	32.1	<35.1
Criterion	**-**	**-**		**90**

6.3 PM_{10}

6.3.1 Maximum 24-Hour Average PM_{10} Concentrations

Table 14 shows the maximum 24-hour average PM_{10} concentrations predicted by the dispersion modelling at the top twelve worst impacted identified sensitive receptors (B04, B12 – 14, B19, L023 – L027, L031, S1, S2) and additional representative receptors (S3 to S5, WR1, WR2 and B16). As discussed in **Section 5.6**, daily varying background concentrations were adopted from the Bathurst monitoring station for contemporaneous analysis of the cumulative assessment.

The maximum increment due to the Approved operations was predicted to occur at receptor 'B04' (26.1 µg/m^3) and for Modification 2 operations, the maximum increment was predicted to occur at receptor 'B12' (0.5 µg/m^3).

The maximum cumulative 24-hour average PM_{10} concentrations are predicted to exceed the criterion of 50 µg/m^3 at receptors 'B04', 'B12', 'B13' and 'B14'. Receptors 'B04', 'B12' and 'B13' are located closest to the SCSS in Blackmans Flat, while receptor 'B14' is located further to the east. Also shown in **Table 14** are the 2nd highest cumulative concentrations and the total number of predicted exceedances at the assessed receptors. A total of three exceedances are predicted to occur at receptor 'B04' within the modelled period (one year).

Receptor 'B04' is predicted to be the worst impacted receptor. It is noted that this receptor is listed for acquisition on request on SSD 5579. In accordance with the Approved Methods, a contemporaneous analysis of the maximum predicted concentrations at the worst impacted receptor (B04) was performed and is presented in **Table 15**.

This analysis shows that on the days of exceedances, the contribution from background concentrations was approximately 60%-63%. Further it can be seen that the contribution of Modification 2 towards the maximum cumulative PM_{10} 24-hour average concentrations is negligible at all the receptors presented in **Table 14**.

Table 14 Predicted Maximum24-Hour PM_{10} Concentrations

Receptor ID	Maximum 24-Hour Average PM_{10} Concentration ($\mu g/m^3$)				2nd Highest Cumulative Concentration ($\mu g/m^3$) Background + Approved + Modification 2	Predicted Number of Exceedances per year
	(Increment) Approved Operations	(Increment) Modification 2	(Maximum Cumulative) Background+ Approved	(Maximum Cumulative) Background+ Approved + Modification 2		
B04	26.1	0.4	60.0	60.0	53.1	3
B12	24.6	0.5	54.4	54.4	49.8	1
B13	24.9	0.4	53.7	53.7	48.6	1
B14	19.7	0.3	50.6	50.6	45.6	1
B19	17.2	0.3	49.6	49.6	45.0	0
L023	12.9	0.2	47.1	47.1	44.4	0
L024	13.0	<0.1	44.2	<44.3	43.8	0
L025	13.2	<0.1	44.2	<44.3	43.9	0
L027	13.2	<0.1	44.3	<44.4	43.8	0
L031	13.6	<0.1	44.4	<44.5	44.0	0
S1	12.4	<0.1	44.4	<44.6	43.4	0
S2	13.0	<0.1	44.6	<44.7	43.7	0
S3	6.5	<0.1	43.5	43.5	42.4	0
S4	3.9	<0.1	44.1	44.1	43.7	0
S5	3.3	<0.1	43.4	43.5	43.3	0
WR1	11.7	0.1	46.6	46.6	44.7	0
WR2	12.2	0.1	47.8	47.8	44.7	0
B16	7.2	0.2	43.9	43.9	43.9	0
Criterion	**-**	**-**	**50**	**50**		

Table 15 Summary of Contemporaneous Analysis – Receptor B04

Date	PM_{10} 24-Hour Average ($\mu g/m^3$)			Date	PM_{10} 24-Hour Average ($\mu g/m^3$)		
	Highest Background	Increment (Approved + Modification 2)	Total		Background	Highest Increment (Approved + Modification 2)	Total
17-12-2014	42.8	3.6	46.4	18-05-2014	15.3	26.1	41.4
14-11-2014	41.0	4.3	45.3	16-01-2014	37.6	22.4	60.0
24-11-2014	38.3	5.8	44.1	07-03-2014	17.7	21.4	39.1
15-11-2014	37.7	4.5	42.2	08-02-2014	31.4	20.9	52.3
16-01-2014	37.6	22.4	60.0	05-03-2014	19.9	20.5	40.4
23-11-2014	37.4	6.2	43.6	30-10-2014	19.5	20.5	40.0
17-01-2014	36.4	4.3	40.7	18-01-2014	32.9	20.2	53.1

The continuous air quality monitoring conducted by WCS (TEOM) showed that there were no exceedances of the 24 hour criterion (refer to **Section 5.6.2.2**), since its inception (22 December 2015 to 20 July 2017). Therefore, the modelling results presented in **Table 14** should be viewed as being conservative in nature.

6.3.2 Annual Average PM_{10} Concentrations

Table 16 shows the annual average PM_{10} concentrations predicted by the dispersion modelling at the top twelve worst impacted identified sensitive receptors (B04, B12 – 14, B19, L023 – L027, L031, S1, S2) and additional representative receptors (S3 to S5, WR1, WR2 and B16).

Table 16 Predicted Annual Average PM_{10} Concentrations

Receptor ID	Annual Average PM_{10} Concentration (µg/m^3)			
	(Increment) Approved Operations	(Increment) Modification 2	Background (Table 10)	(Cumulative) Background + Approved + Modification 2
B04	5.2	<0.1	14.6	<19.9
B12	4.1	<0.1	14.6	<18.8
B13	4.2	<0.1	14.6	<19.0
B14	3.3	<0.1	14.6	<18.0
B19	3.1	<0.1	14.6	<17.8
L023	2.3	<0.1	14.6	<17.0
L024	2.9	<0.1	14.6	<17.6
L025	3.0	<0.1	14.6	<17.7
L027	3.0	<0.1	14.6	<17.7
L031	3.1	<0.1	14.6	<17.8
S1	2.9	<0.1	14.6	<17.5
S2	3.0	<0.1	14.6	<17.7
S3	1.4	<0.1	14.6	<16.1
S4	0.6	<0.1	14.6	<15.3
S5	0.4	<0.1	14.6	<15.1
WR1	3.5	<0.1	14.6	<18.2
WR2	3.1	<0.1	14.6	<17.8
B16	1.5	<0.1	14.6	<16.2
Criterion	**-**	**-**		**25**

The annual average PM_{10} concentrations are predicted to be well below the criterion of 25 µg/m^3 at all identified sensitive receptor locations.

The continuous air quality monitoring conducted by WCS (TEOM) gave an annual average PM_{10} concentration of 11.3 µg/m^3 (refer to **Section 5.6.2.2**), for the full year 2016 (1 January 2017 to 31 December 2017). Therefore, the modelling results presented in **Table 16** should be viewed as being conservative in nature.

6.4 $PM_{2.5}$

6.4.1 Maximum 24-Hour Average $PM_{2.5}$ Concentrations

Table 17 shows the maximum 24-hour average $PM_{2.5}$ concentrations predicted by the dispersion modelling at the top twelve worst impacted identified sensitive receptors (B04, B12 – 14, B19, L023 – L027, L031, S1, S2) and additional representative receptors (S3 to S5, WR1, WR2 and B16).

Background $PM_{2.5}$ concentration data are not available for the area surrounding SCSS and therefore an analysis of cumulative concentrations cannot be performed.

The combined incremental 24-hour average $PM_{2.5}$ concentrations for the approved and modification operations are predicted to be well below the criterion of 25 µg/m^3 at the top twelve worst impacted identified sensitive receptors (B04, B12 – 14, B19, L023 – L027, L031, S1, S2) and additional representative receptors in (S3 to S5, WR1, WR2 and B16). Further it can be seen that the contribution of Modification 2 towards the maximum 24-hour average $PM_{2.5}$ concentrations is negligible.

Table 17 Predicted 24-Hour Maximum $PM_{2.5}$ Concentrations

Receptor ID	Maximum 24-Hour Average $PM_{2.5}$ Concentration (µg/m^3)		
	(Increment) Approved Operations	(Increment) Modification 2	(Total Maximum Increment) Approved+ Modification 2
B04	3.2	<0.1	<3.3
B12	3.0	0.1	3.1
B13	3.1	0.1	3.2
B14	2.4	<0.1	<2.5
B19	2.1	<0.1	<2.2
L023	1.6	<0.1	<1.7
L024	1.6	<0.1	<1.7
L025	1.6	<0.1	<1.7
L027	1.6	<0.1	<1.7
L031	1.7	<0.1	<1.8
S1	1.5	<0.1	<1.6
S2	1.6	<0.1	<1.7
S3	0.8	<0.1	<0.9
S4	0.5	<0.1	<0.6
S5	0.4	<0.1	<0.5
WR1	1.4	<0.1	<1.5
WR2	1.5	<0.1	<1.6
B16	0.9	<0.1	<1.0
Criterion	**-**	**-**	**25 (Cumulative)**

6.4.2 Annual Average $PM_{2.5}$ Concentrations

Table 18 shows the annual average $PM_{2.5}$ concentrations predicted by the dispersion modelling at the top twelve nominated residences/properties (B04, B12 – 14, B19, L023 – L027, L031, S1, S2) and additional representative receptors (S3 to S5, WR1, WR2 and B16).

Table 18 Predicted Annual Average $PM_{2.5}$ Concentrations

Receptor ID	Annual Average $PM_{2.5}$ Concentration ($\mu g/m^3$)		
	(Increment) Approved Operations	(Increment) Modification 2	(Total Maximum Increment) Approved+ Modification 2
B04	0.7	<0.1	<0.8
B12	0.5	<0.1	<0.6
B13	0.5	<0.1	<0.6
B14	0.4	<0.1	<0.5
B19	0.4	<0.1	<0.5
L023	0.3	<0.1	<0.4
L024	0.4	<0.1	<0.5
L025	0.4	<0.1	<0.5
L027	0.4	<0.1	<0.5
L031	0.4	<0.1	<0.5
S1	0.4	<0.1	<0.5
S2	0.4	<0.1	<0.5
S3	0.2	<0.1	<0.3
S4	0.1	<0.1	<0.2
S5	<0.1	<0.1	<0.2
WR1	0.4	<0.1	<0.5
WR2	0.4	<0.1	<0.5
B16	0.2	<0.1	<0.3
Criterion		**-**	**8 (Cumulative)**

The combined incremental annual average $PM_{2.5}$ concentrations for the approved and modification operations are predicted to be well below the criterion of 8 $\mu g/m^3$ the identified sensitive receptor locations. Further it can be seen that the contribution of Modification 2 towards the annual average $PM_{2.5}$ concentrations is negligible.

6.5 Sensitivity Analysis - 24-hour Average PM_{10} Concentration Results

A sensitivity analysis was performed on the predicted concentrations of maximum cumulative 24 hour average PM_{10}, using background PM_{10} concentrations recorded at the WCS TEOM, to compare against the predictions when the Bathurst OEH monitoring station background datasets are used (**Section 6.3**).

Table 19 shows the maximum 24-hour average PM_{10} concentrations predicted by the dispersion modelling at the top twelve worst impacted identified sensitive receptors (B04, B12 – 14, B19, L023 – L027, L031, S1, S2) and additional representative receptors (S3 to S5, WR1, WR2 and B16), using background PM_{10} concentrations recorded at the WCS TEOM. As discussed in **Section 5.6.2.2**, the daily varying background concentrations recorded at the WCS TEOM were recorded during the year 2016.

The maximum cumulative 24-hour average PM_{10} concentrations are predicted to below the criterion of 50 $\mu g/m^3$ at all identified sensitive receptors.

When the maximum cumulative concentrations presented in **Table 19**, both for the 'Approved' operations and 'Approved + Modification 2' operations, are compared with the equivalent results presented in **Table 14**, it can be seen that the results using the WCS TEOM daily varying PM_{10} background levels are generally lower than when the Bathurst daily varying PM_{10} background levels are used.

It is noted that the analysis presented in **Table 19** is not in accordance with the Approved Methods, as the year of background data (2016) and meteorological data (2014) are not the same. However, it has been shown in **Section 5.6.2.2**, that generally the data recorded at Bathurst monitoring station is higher. Therefore, this analysis shows that the results presented in this report (refer **Section 6.3.1**) should be viewed as conservative and that in reality the concentrations are likely to be lower than those presented in this report. This is supported by the WCS TEOM data since commencement of monitoring in 2015, no exceedance of the maximum cumulative 24-hour average PM_{10} criterion of 50 µg/m^3 has been recorded, which is also consistent with the PM_{10} data from the WCS HVAS.

Table 19 Predicted 24-Hour PM_{10} Concentrations using WCS TEOM Data (2016)

Receptor ID	Maximum 24-Hour Average PM_{10} Concentration (µg/m^3)			
	(Increment) Approved Operations (Table 14)	(Increment) Modification 2 (Table 14)	(Maximum Cumulative) Background+ Approved	(Maximum Cumulative) Background+ Approved + Modification 2
B04	26.1	0.4	46.2	46.2
B12	24.6	0.5	43.7	43.8
B13	24.9	0.4	42.4	42.4
B14	19.7	0.3	42.5	42.5
B19	17.2	0.3	42.0	42.0
L023	12.9	0.2	40.7	40.7
L024	13.0	<0.1	42.4	<42.5
L025	13.2	<0.1	42.4	<42.5
L027	13.2	<0.1	42.5	<42.6
L031	13.6	<0.1	43.0	<43.1
S1	12.4	<0.1	43.1	<43.2
S2	13.0	<0.1	43.8	<43.9
S3	6.5	<0.1	41.0	<41.1
S4	3.9	<0.1	37.8	<37.9
S5	3.3	<0.1	37.8	<37.9
WR1	11.7	0.1	42.8	42.8
WR2	12.2	0.1	40.8	40.8
B16	7.2	0.2	39.5	39.5
Criterion	**-**	**-**	**50**	**50**

7 DISCUSSIONS AND CONCLUSIONS

SLR Consulting was commissioned by Springvale Coal Pty Ltd (Springvale Coal) to undertake an Air Quality Impact Assessment for a proposed modification to State Significant Development (SSD) 5579 (Modification 2).

Springvale Coal is seeking a modification to SSD-5579 (Modification 2) to allow for:

- An increase in the amount of ROM coal that can be received at the SCSS via conveyors from the Springvale Mine from 4.5 Mtpa to up to 5.5 Mtpa;
- Establishment of a 80,000 tonne product coal stockpile (near the washery) within the SCSS;

A dispersion modelling exercise has been performed to assess the potential impacts of fugitive particulate emissions from the approved WCS operations and proposed Modification 2 operations ('Approved' and 'Modification 2' respectively). The estimated particulate emissions for the Approved scenario were adopted from the AQIA prepared for the WCS Project by PEL in 2013 (PEL 2013) in support of the development application SSD 5579. Emissions for the proposed new activities associated with Modification 2 scenario were calculated by SLR using published emission factors.

Several differences were identified between modelling approach used in the PEL report and the current assessment such as the different meteorological data inputs, different modelled year (2014), and the different background dataset. Therefore, the predicted results showed in the PEL report should not be viewed as directly comparable to those presented in this report.

Ambient air quality monitoring data from the OEH-operated Bathurst monitoring station and the on-site WCS operations dust monitoring programme were used to derive estimated background particulate levels to assess the cumulative impact from Modification 2. The particulate concentrations have been predicted at a total of 168 sensitive receptors located within the region of the WCS operations. However, the modelling results for the top twelve worst impacted identified sensitive receptors (B04, B12 – 14, B19, L023 – L027, L031, S1, S2) and additional representative receptors (S3 to S5, WR1, WR2 and B16) have only been provided in this assessment. The modelling methodology included a number of assumptions which mean that conservative 'worst case' scenarios were modelled. For instance,

- the approved scenario has been modelled representing all approved activities in the WCS Project operating concurrently over a year. In reality not all approved activities have been constructed as yet within the WCS Project and not all existing activities operate concurrently.
- The assessment of 'Approved' scenario has included operations which are not part of the WCS Project (i.e Angus Place Colliery pit top, Springvale pit top and the proposed Neubeck Project coal and reject handling operations). These non-WCS Project operations have been included only to be consistent with the PEL report. Therefore, all predictions should be viewed as conservative, with actual levels expected to be lower than those predicted by the modelling data presented in this report.
- The Bathurst PM_{10} daily varying PM_{10} concentration datasets for the year 2014 were used as background levels in the predictions for PM_{10} concentrations at the identified receptors. A comparison of the Bathurst dataset against the equivalent data from the WCS TEOM and WCS HVAS showed the Bathurst PM_{10} datasets are consistently higher. A sensitivity analysis has been undertaken to confirm this, albeit using the 2016 TEOM data. This analysis showed that the results presented in this report should be viewed as conservative and that in reality the PM_{10} concentrations are likely to be lower than those presented.

The predicted results showed that the proposed Modification 2 activities are unlikely to cause any additional exceedances of the relevant ambient air quality criteria for TSP and $PM_{2.5}$ concentrations or dust deposition at any identified surrounding sensitive receptors. Exceedances of PM_{10} criterion have been predicted for receptors 'B04, 'B12', 'B13' and 'B14', however on further investigation it was found that the exceedances were dominated by the high regional background concentrations and the contribution of Modification 2 to the predicted cumulative impacts at these receptors is negligible.

Based on these results, it is concluded that there are no constraints in relation to air quality impacts at nearby residential locations in regards to the changes proposed for Modification 2.

It is recommended that the WCS operations continue to undertake the air quality monitoring in accordance with the SSD 5579 consent conditions and the approved WCS Air Quality Management Plan.

8 REFERENCES

- Centennial 2016, Statement of Environmental Effects – Western Coal Services Project (SSD-5579) – Modification 1, Volume 1 – Main Report, Prepared by: Centennial Coal Company Limited, 18 November 2016.
- Centennial 2016a, Air Quality and Greenhouse Gas Management Plan for Western Region, Centennial Coal, July 2016.
- Centennial 2017, Western Coal Services Project – State Significant Development 5570, Modification 2 - Project Description, Prepared by: Centennial Coal Company Limited, February 2017.
- DSEWPC 2012, *National Pollutant Inventory Emission Estimation Technique Manual for Mining* version 3.1 published by the Department of Sustainability, Environment, Water, Population and Communities. January 2012.
- EPA 2017, Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales, Environment Protection Authority NSW, January 2017.
- NEPC 2016, *Variation to the National Environment Protection (Ambient Air Quality) Measure*. Canberra: National Environment Protection Council.
- Oke 2004, Boundary Layer Climates, Second Edition, Routledge, London and New York, 435 pp.
- PEL 2013, Air Quality Impact and Greenhouse Gas Assessment, Western Coal Services Project – Blackmans Flat, Centennial Coal, Pacific Environment Limited Job no. 5299A, 29 July 2013.
- Pasquill, 1961 *The estimation of the dispersion of windborne material*, The Meteorological Magazine, Vol 90, No. 1063, pp 33-49.
- SLR 2015, Neubeck Coal Project - Air Quality and Greenhouse Gas Impact Assessment, report number 630.10123.10190-R1, dated 25 March 2015.
- SLR 2016, Springvale Mine – Modification 1 to State Significant Development 5594, Air Quality and Greenhouse Gas Impact Assessment, report number 630.11526-R1, dated 5 April 2016.
- TRC 2011, Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW, Australia', prepared for Ofice of Environment and Heritage, Sydney Australia, prepared by: Jennifer Barclay and Joe Scire, Atmopheric Studies Group, TRC Environmental Corporation, March 2011.
- USEPA 2006, United States Environmental Protection Authority, Compilation of Air Pollutant Emission Factors AP-42 - Chapter 13.2.4 Aggregate Handling and Storage Piles.

List of Sensitive Receptors

Receptor ID	UTM X (m)	UTM Y (m)	Receptor ID	UTM X (m)	UTM Y (m)
B04	226,588	6,304,405	L035	228,971	6,301,629
B12	226,808	6,304,169	L036	228,991	6,301,636
B13	226,937	6,304,222	L037	228,990	6,301,677
B14	227,546	6,304,122	L038	229,007	6,301,692
B15	227,516	6,303,810	L039	229,003	6,301,737
B16	227,442	6,303,343	L040	229,005	6,301,759
B17	226,500	6,302,886	L041	228,909	6,301,626
B18	224,512	6,302,006	L042	228,936	6,301,675
B19	227,523	6,304,026	L043	228,941	6,301,695
B20	227,678	6,303,828	L044	228,958	6,301,740
B21	227,747	6,303,595	L045	228,945	6,301,795
B22	227,763	6,303,501	L046	228,881	6,301,635
B23	227,666	6,303,435	L047	228,873	6,301,672
B24	227,926	6,303,709	L048	228,831	6,301,694
B25	227,972	6,303,699	L049	228,842	6,301,740
B26	228,082	6,303,754	L050	228,849	6,301,760
B27	228,116	6,303,751	L051	228,848	6,301,786
B28	228,067	6,303,705	L052	228,852	6,301,807
B29	228,085	6,303,702	L053	228,791	6,301,737
B30	228,102	6,303,700	L054	228,802	6,301,785
B31	228,164	6,303,613	L055	228,708	6,301,806
B32	227,695	6,303,362	L056	228,794	6,301,817
B33	227,766	6,303,127	L057	228,642	6,301,891
B34	227,779	6,303,117	L058	228,855	6,301,846
B35	228,233	6,303,577	L059	228,865	6,301,861
B36	228,076	6,302,708	L060	228,860	6,301,883
B37	228,250	6,302,487	L061	228,814	6,301,882
B38	228,311	6,302,573	L062	228,866	6,301,899
B39	228,441	6,302,208	L063	228,801	6,301,912
B40	228,510	6,302,248	L064	228,874	6,301,930
B41	228,489	6,302,098	L065	228,879	6,301,943
B42	228,550	6,302,043	L066	228,880	6,301,971
B43	228,562	6,301,978	L067	228,906	6,301,997
B44	228,529	6,302,715	L068	228,881	6,302,046
B45	228,623	6,302,789	L069	228,832	6,302,028
B46	228,603	6,302,791	L070	228,924	6,302,069
B47	228,583	6,302,795	L071	228,908	6,302,122
B48	228,564	6,302,797	L072	228,917	6,302,157
B49	228,545	6,302,798	L073	228,906	6,302,215
B50	228,523	6,302,791	L074	228,752	6,302,222
B51	228,426	6,302,779	L075	228,919	6,302,286
B52	228,926	6,303,683	L076	228,919	6,302,303
B53	228,169	6,302,895	L077	228,973	6,302,313
B54	227,547	6,303,738	L078	228,923	6,302,339
B55	227,527	6,303,315	L079	228,925	6,302,353

List of Sensitive Receptors

Receptor ID	UTM X (m)	UTM Y (m)	Receptor ID	UTM X (m)	UTM Y (m)
B56	227,459	6,303,171	L080	228,937	6,302,369
B57	227,535	6,303,175	L081	228,936	6,302,385
B58	227,633	6,303,105	L082	228,932	6,302,406
B59	228,610	6,302,180	L083	228,937	6,302,419
B60	228,687	6,301,953	L084	228,939	6,302,438
L001	229,078	6,302,626	L085	228,944	6,302,453
L002	229,028	6,301,777	L086	228,943	6,302,472
L003	228,690	6,301,071	L087	228,981	6,302,478
L004	228,628	6,301,082	L088	228,956	6,302,503
L005	228,607	6,301,085	L089	228,951	6,302,521
L006	228,585	6,301,092	L090	228,955	6,302,538
L007	228,567	6,301,095	L091	228,962	6,302,552
L008	228,547	6,301,096	L092	228,959	6,302,570
L009	228,528	6,301,098	L093	228,961	6,302,588
L010	228,482	6,301,107	L094	228,962	6,302,612
L011	228,509	6,301,164	L095	228,966	6,302,629
L012	228,472	6,301,131	L096	228,979	6,302,659
L013	228,445	6,301,116	L097	228,912	6,302,661
L014	228,426	6,301,119	L098	228,960	6,303,141
L015	228,449	6,301,157	L099	229,028	6,303,579
L016	228,753	6,301,146	L100	229,213	6,303,684
L017	228,692	6,301,112	L101	229,226	6,303,849
L018	228,705	6,301,138	R01	228,036	6,300,415
L019	228,704	6,301,176	R02	227,837	6,300,179
L020	228,785	6,301,201	R03	227,420	6,300,654
L021	228,705	6,301,193	R04	227,484	6,301,148
L022	228,707	6,301,213	R07	227,300	6,299,746
L023	228,974	6,301,043	R08	227,568	6,299,831
L024	228,984	6,301,139	R09	227,415	6,299,619
L025	228,966	6,301,227	R10	226,917	6,300,236
L026	228,769	6,301,269	R11	226,928	6,300,457
L027	228,967	6,301,298	R12	226,936	6,300,677
L028	228,806	6,301,362	S1	230,210	6,299,703
L029	228,807	6,301,393	S2	230,469	6,299,536
L030	228,725	6,301,421	S3	228,775	6,301,089
L031	229,049	6,301,453	S4	231,589	6,299,387
L032	229,009	6,301,442	S5	232,009	6,299,182
L033	228,930	6,301,569	WR1	229,391	6,305,106
L034	228,953	6,301,588	WR2	229,342	6,304,611

Activity	Approved (kg/y)[1]			Modification 2 (kg/y)		
	TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$
SCSS						
Unloading conveyer from Springvale (ROM)	848	332	40	590	279	42
Unloading coal from trucks from Angus Place	135,107	52,827	6,350	0	0	0
Unloading coal from trucks from Neubecks	33,777	13,207	1,588	0	0	0
FEL loading ROM coal to washery	1,319	516	62	0	0	0
Dozers on coal stockpiles (ROM + product)[2]	32,790	12,821	1,541	0	0	0
Wind erosion on coal stockpiles (ROM + product)	3,154	1,233	148	3,854	1,927	180
Hauling rejects to emplacement areas	48,398	18,924	2,275	0	0	0
Dozers on REA	1,969	770	93	0	0	0
Trucks dumping on REA	92	36	4	0	0	0
Hauling coal from Angus Place on new link road	29,567	11,561	1,390	0	0	0
Hauling rejects off site on new link road	12,446	4,866	585	0	0	0
Hauling coal from Neubecks on new link road	12,446	4,866	585	0	0	0
Springvale Pit Top[3]						
Wind erosion on ROM stockpiles	4,205	1,644	198	0	0	0
Wind erosion on other exposed areas	2,453	959	115	0	0	0
Dozers on coal stockpiles	43,720	17,095	2,055	0	0	0
Loading conveyor	-	-	-	590	279	42
Angus Place Colliery[3]						
Loading ROM to stockpile (via conveyer)	754	295	35	0	0	0
Loading ROM to truck through chute	754	295	35	0	0	0
Wind erosion on ROM Stockpiles	1,051	411	49	0	0	0
Wind erosion on other exposed areas	1,051	411	49	0	0	0
Dozers on Angus Place stockpile	70,191	27,445	3,299	0	0	0
Kerosene Vale Stockpile Area						
Unloading ROM at Kerosene Vale stockpile	16,843	6,586	792	0	0	0
Re-loading ROM at Kerosene Vale stockpile	16,843	6,586	792	0	0	0
Dozer on stockpile	14,973	5,854	704	0	0	0
Wind erosion on stockpile	5,256	2,055	247	0	0	0
Neubecks[3]						
Hauling coal on sealed road to CCSS intersection with new link road	18,439	7,210	867	0	0	0
Hauling reject on sealed road from CCSS intersection with new link road	18,439	7,210	867	0	0	0
Emissions due to operations (1 Mtpa of ROM, 4 Mbcm of overburden removal, transport and wind erosion)	181,952	71,143	8,552	0	0	0
Angus Place						
Hauling ROM coal on sealed road to MPPS	170,474	66,655	8,012	0	0	0
Hauling ROM coal on sealed road to WPS	118,226	46,226	5,557	0	0	0

Activity	Approved (kg/y)[1]			Modification 2 (kg/y)		
	TSP	**PM_{10}**	**$PM_{2.5}$**	**TSP**	**PM_{10}**	**$PM_{2.5}$**
Overland Conveyor						
SCSS to Lidsdale Siding	70	27	3	16	6	0.7
From Springvale pit top to SCSS and SCSS to MPPS[4]	30	12	1	7	2.7	0.2
TOTAL	**997,637**	**390,076**	**46,889**	**5,057**	**2,495**	**266**

[1] Source: PEL 2013

[2] It is noted that there will be no additional dozers due to this modification, rather the existing fleet will be utilised on the new product stockpile within the approved operational hours for the dozers.

[3] As noted in **Section 2.2.2** and **Section 2.2.3** of this report, these activities are included in the approved scenario of this assessment only because they were assessed in the PEL report. It is noted that these activities do not form part of the WCS Project.

[4] The emissions for the approved scenario have been adopted from the PEL report. It is assumed that these emissions are combined emissions from Springvale pit top to SCSS, and from SCSS to MPPS.

Figure C1 Contour Plot of Maximum Incremental Annual Average Dust Deposition

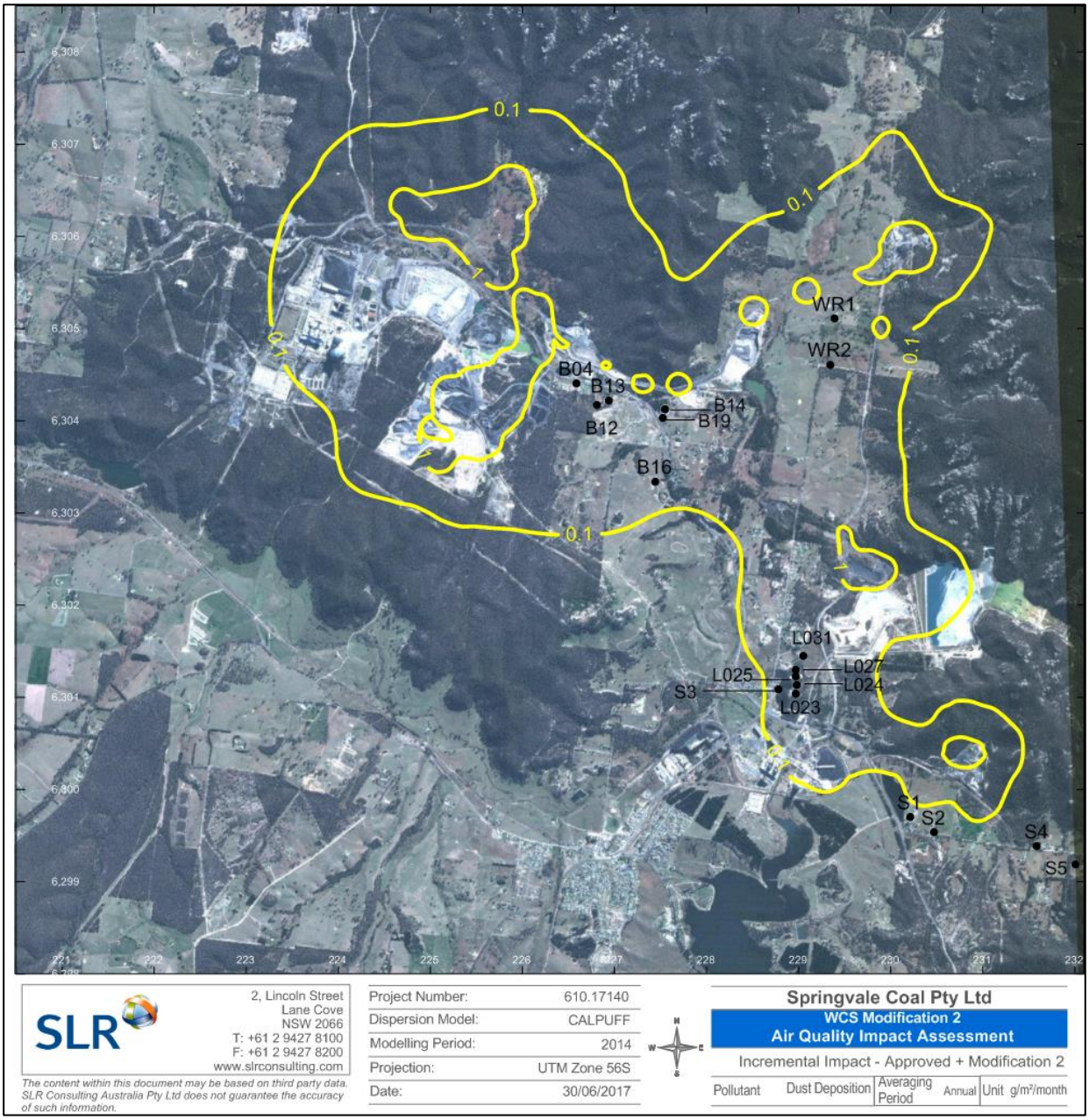


Figure C2 Contour Plot of Maximum Incremental Annual Average TSP Concentrations

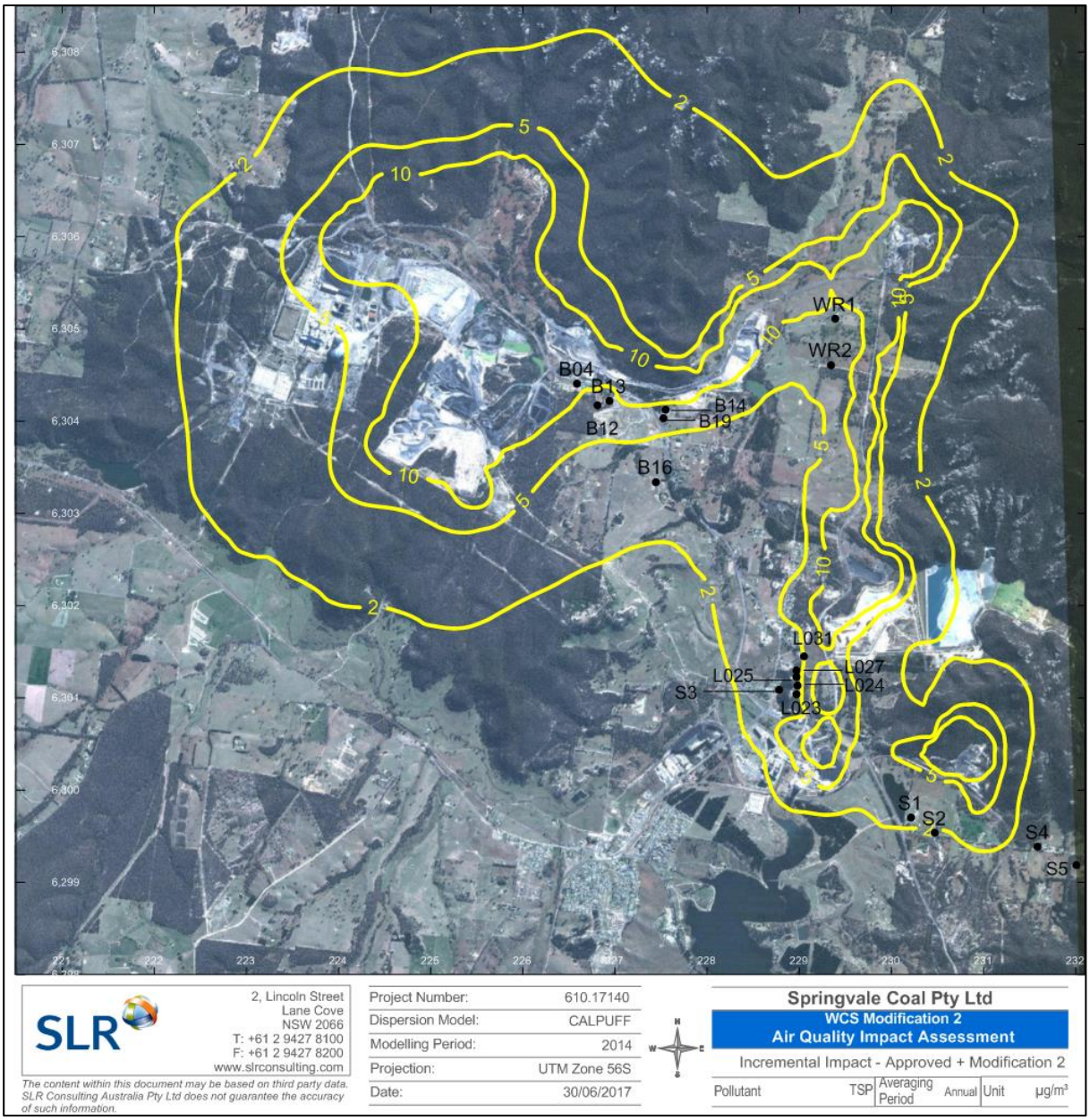


Figure C3 Contour Plot of Maximum Incremental 24-hour Average PM_{10} Concentrations

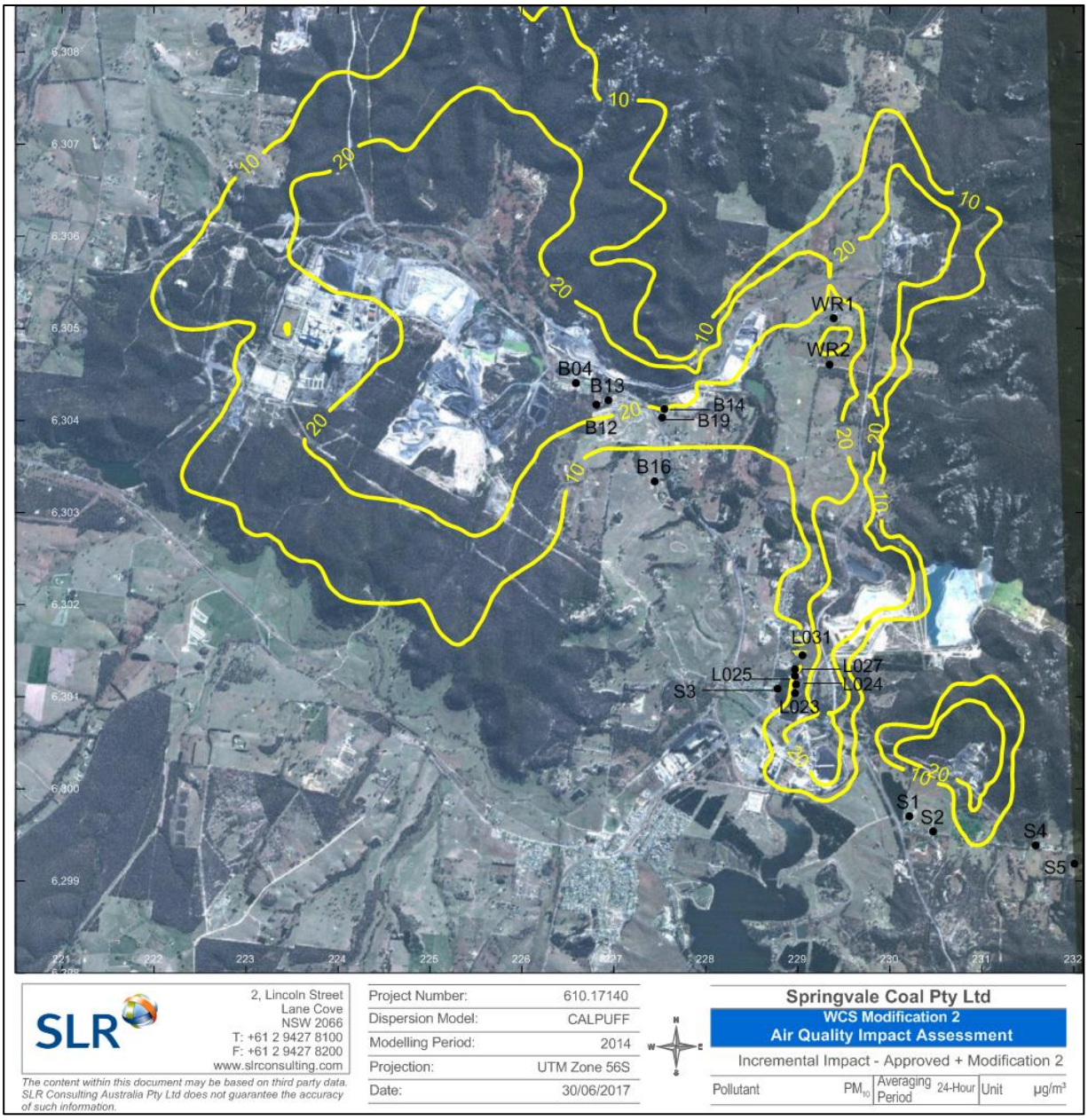


Figure C4 Contour Plot of Maximum Incremental Annual Average PM_{10} Concentrations

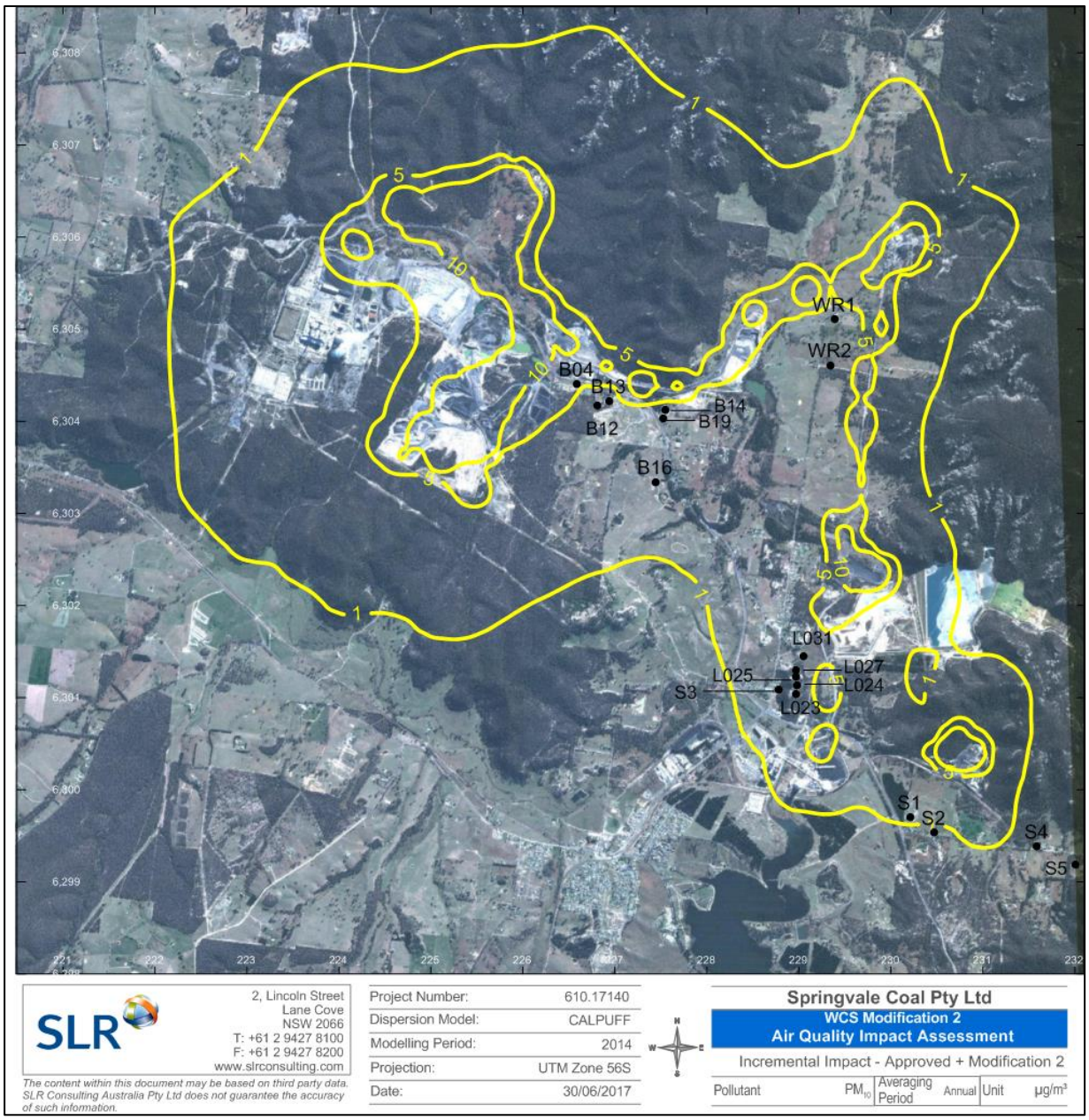


Figure C5 Contour Plot of Maximum Incremental 24-hour Average $PM_{2.5}$ Concentrations

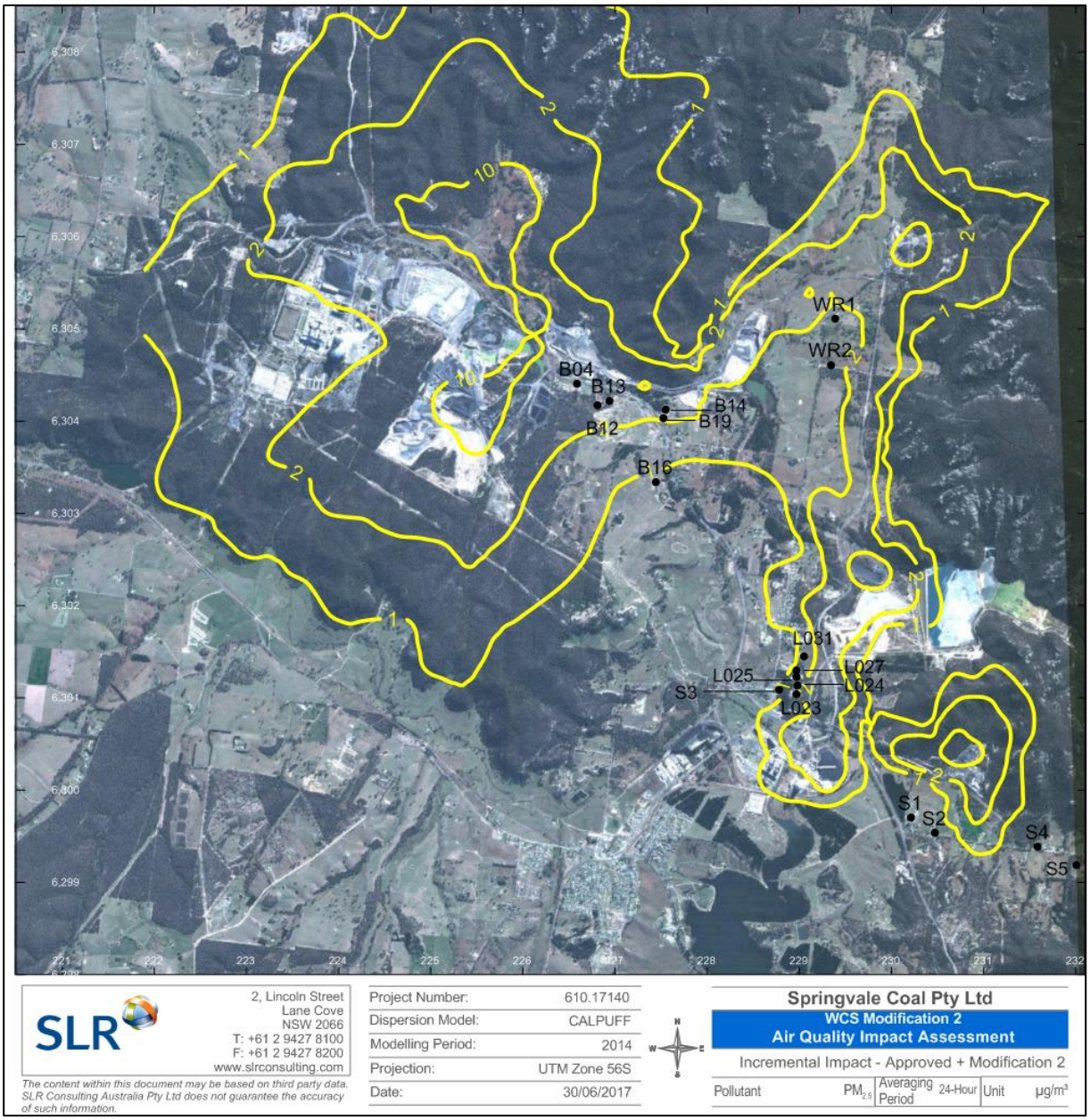
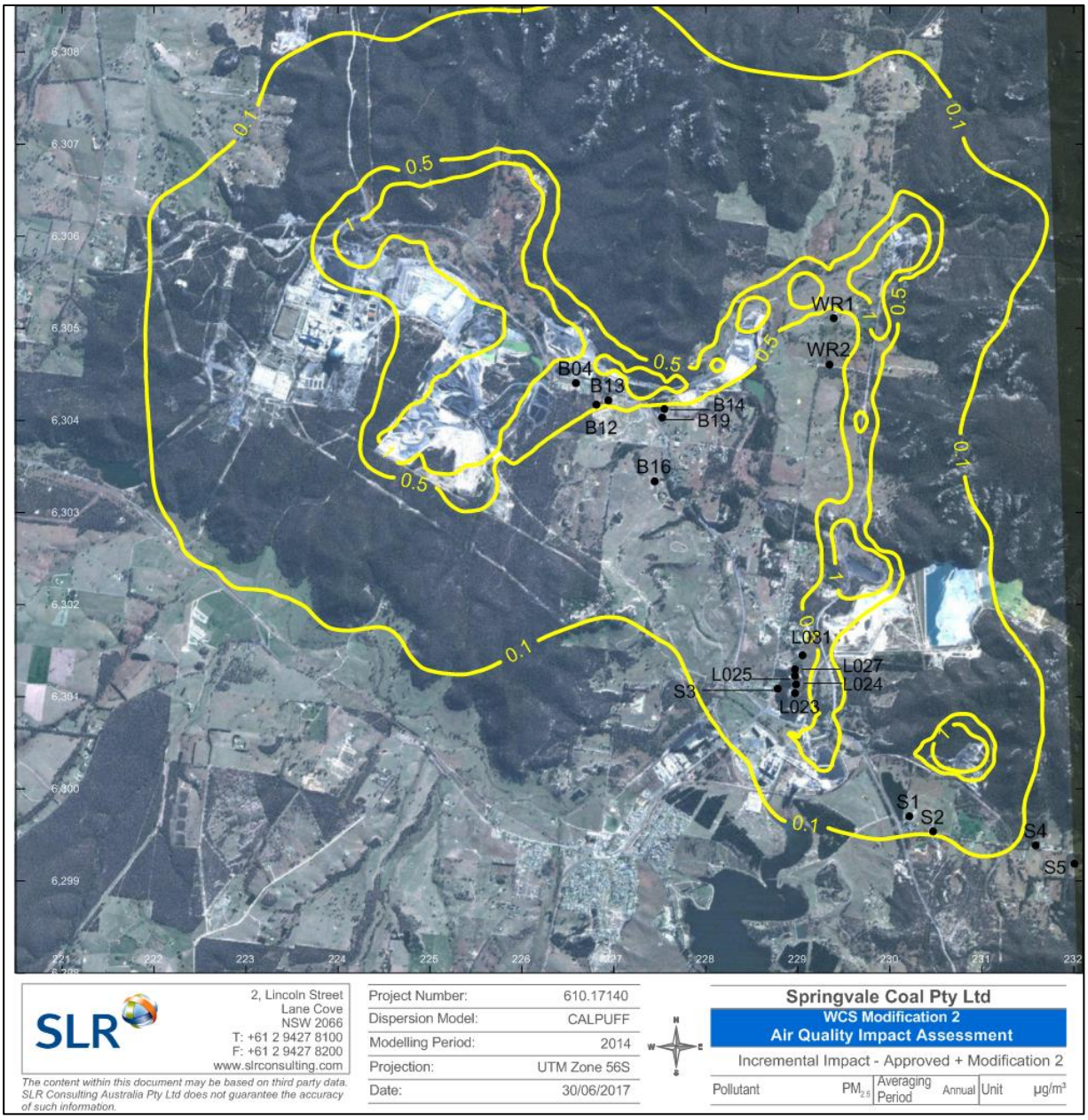


Figure C6 Contour Plot of Maximum Incremental Annual Average $PM_{2.5}$ Concentrations



Social Impact Assessment

APPENDIX – G

Centennial Coal

Western Coal Services Project
State Significant Development 5579

Modification 2

Social Impact Assessment

August 2017

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EXECUTIVE SUMMARY

This Social Impact Assessment (SIA) has been prepared to support an application by Springvale Coal Pty Ltd to modify the State Significant Development (SSD) consent 5579 which was granted on 4 April 2014. Springvale Coal is seeking a modification to SSD 5579 to allow for:

- An increase in the amount of coal that can be received by the Project from Springvale Mine from the approved 4.5 million tonnes per annum (Mtpa) to up to 5.5 Mtpa on the overland conveyor.
- The establishment of a dedicated product coal stockpile of 80,000 tonne capacity in the vicinity of the coal preparation plant.
- Increase in workforce from the approved 18 full time equivalent (fte) personnel to 25 fte personnel.
- A revision in the application of noise limits in SSD 5579 and propose to restrict the limits to the SCSS operations only.

Exceedances of the noise limits set out in SSD 5579, that are measured at a number of receptors during monthly attended noise monitoring since July 2014 has prompted Springvale Coal to review its noise limits in SSD 5579 and seek revision in the application of these limits to the Springvale Coal Services Site and preclude their application to other project components comprising the overland conveyors system, Mount Piper Haul Road, Wallerawang Haul Road and Kerosene Vale Stockpile Area.

The proposal to restrict haul trucks to day time operations, install low noise idlers to sections of the overland conveyor and implement a series of mitigation and operational changes to the Springvale Coal Services site will improve the noise environment to a lower level than what was achieved prior to the granting of the SSD 5579 consent. This SIA therefore reflects this change and considers the strategies outlined in the Noise Impact Assessment to be a positive contribution to the noise environment of Blackmans Flat, Lidsdale and Wallerawang. Ongoing consultation will be undertaken with residents identified as being noise affected and the broader community to outline the progress of the works program and verification of noise monitoring results that are achieved.

1. INTRODUCTION

This Social Impact Assessment (SIA) relates to an application by Springvale Coal Pty Limited (Springvale Coal) who is proposing to modify the State Significant Development (SSD) consent 5579 which granted approval to the Western Coal Services Project (the Project). The consent was granted under Section 89E of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 04 April 2014 by the Planning Assessment Commission of NSW, as delegate of the then Minister of Planning and Infrastructure.

SSD 5579 allows for the operation and construction of infrastructure to facilitate the receipt, handling and processing of coal from the Springvale Mine, Angus Place Colliery and other Centennial Coal operations, and the transportation of this coal to local power stations or the Centennial Coal operated Lidsdale Rail Siding. In the future the Project will support the Springvale Water Treatment Project (SSD 7592), as proposed in this modification.

Springvale Coal is seeking a modification to SSD 5579 to allow for:

- An increase in the amount of coal that can be received by the Project from Springvale Mine from the approved 4.5 million tonnes per annum (Mtpa) to up to 5.5 Mtpa on the overland conveyor.
- The establishment of a dedicated product coal stockpile of 80,000 tonne capacity in the vicinity of the coal preparation plant.
- Increase in workforce from the approved 18 full time equivalent (fte) personnel to 25 fte personnel.
- A revision in the application of noise limits in SSD 5579 and propose to restrict the limits to the SCSS operations only.

2. NEED FOR MODIFICATION

Concern about the exceedances of the noise limits in SSD 5579 measured at a number of nearest receptors during monthly attended noise monitoring since July 2014 has prompted Springvale Coal to review its noise limits in SSD 5579 and seek revision in the application of these limits and propose to restrict to the SCSS operations only. Concurrently Springvale Coal will continue the implementation of mitigation measures to the overland conveyor system and management practices in other activities in accordance to the works plan identified in Table 8 in order to reduce noise emissions to the environment so that the Project meets the noise limits.

ROM coal production at Springvale Mine has been increased from 4.5 Mtpa to 5.5 Mtpa in the Springvale Modification 1, approved on 19 April 2017. This increase has necessitated the need to increase the amount of ROM coal that can be received from that mine by the Project to up to 5.5 Mtpa. However, this increase of an additional 1 Mtpa of coal from Springvale Mine will fall within the maximum 9.5 Mtpa of ROM coal approved in SSD 5579.

A 80,000 tonne product stockpile in the vicinity of the CPP will be established as part of this modification.

The workforce is proposed to be increased from the approved 18 fte personnel to 25 fte personnel to provide operational flexibility in the Project.

3. SOCIAL IMPACT ASSESSMENT

3.1 Overview

A SIA is a systematic, staged approach of enquiry that identifies who may be affected by the project and how they are affected. This SIA has taken into account the *Social impact assessment – Draft guidelines for State significant mining, petroleum production and extractive industry development* released by the Department of Planning and Environment (DPE) in December 2016.

The draft guidelines state that "…a 'social impact assessment' is the process of analysing, assessing and responding to the potential social impacts of a proposed development, with a view to minimising negative social impacts and enhancing positive social impacts. The resulting analysis is an input to the overall environmental impact assessment process for the proposed development. If the proposed development is approved, the social impact assessment can provide a foundation for ongoing monitoring and adaptive management of predicted and unforeseen impacts over the life of the project" (DPE 2016: 7).

This SIA has taken into account the scope of the proposed modification and how the modification elements will improve the noise environment in the Lidsdale, Blackman's Flat and Wallerawang areas.

The core steps are:

1. Profiling: This involves understanding the scale and scope of the modification elements and identifying the stakeholders (i.e. in this case potentially affected landholders).

2. Scoping: This involves identifying the likely impacts arising from the modification and includes consultation and feedback from identified stakeholders. In this instance, Centennial Coal has undertaken extensive consultation with the community through the existence of its mine and mine infrastructure operations over many years. Consultation has included internal engagement as well as direct consultation with affected people who are affected by the presence of the SCSS infrastructure.

3. Assessment: The assessment phase of the SIA is determined by the likely impacts and as a guide may include (but not be limited to):
   - 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 effect 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. In this case the proposed works plan and operational changes is the management tool that is to be implemented to address noise compliance issues.

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. Monthly noise monitoring will be undertaken to verify the noise results achieved as part of the works program. These results will be made available to affected residents.

3.2 Author Qualifications

This SIA has been prepared by James Marshall, Group Manager Stakeholder Engagement, Centennial Coal who has over twenty years' experience in the social planning sector with experience in local government (10 years), the NGO sector (5 years) and as a private consultant (7 years). During this time expert advice and support has been provided in relation to:

- Strategic social planning;
- Social Impact Assessment;
- Community and Stakeholder Engagement;
- Safer by Design (CPTED);
- Mediation;
- Community and Social Research;
- Feasibility Studies; and
- Urban Design and Master Planning.

3.3 Site Description

3.3.1 Site Location

WCS operations are comprised of four discrete project components:

- the Springvale Coal Services site (SCSS);
- Mt Piper haul road;
- Wallerawang haul road and the Kerosene Vale Coal Stockpile Area; and

- the overland conveyor system traversing from the Springvale Mine pit top to Mt Piper Power Station split into five sections with labels OL1 – OL5.

WCS operations are approved to operate 24 hours, seven days per week except:

- no truck movements for coal transportation on Wallerawang Haul Road can take place during the night period;
- no truck movements for coal transportation on Mount Piper Haul Road can take place during adverse meteorological conditions during the night period; and
- Kerosene Vale Coal Stockpile Area operations can only take place during the day period.

3.3.2 Springvale Coal Services Site

The SCSS consists of an existing coal preparation plant (CPP) of 2 Mtpa capacity, coal stockpiles, emplacement facilities for coarse and fine reject materials (tailings), and a coal distribution network of conveyors. The OL2 (part) and OL3 sections of the overland conveyor system also traverse the SCSS. A new CPP with a 5 Mtpa capacity is approved but has not yet been constructed, however has been assessed as a future potential noise source. The CPP, conveyors and mobile plant (loaders, dozers and haul trucks) operating at SCSS are noise sources with the potential to impact sensitive receptors in Blackmans Flat.

3.3.3 Wallerawang Haul Road and Kerosene Vale Stockpile Area

The Wallerawang haul road is used for traversing between Angus Place Colliery, Kerosene Vale Stockpile Area and Wallerawang Power Station. Haul trucks and loaders are noise sources with the potential to impact sensitive receptors on Wolgan Road and parts of Lidsdale. Due to Angus Place Colliery being on care and maintenance, there is currently no haulage occurring on this haul road, or loaders operating at Kerosene Vale Stockpile Area. Springvale Coal is currently undertaking a feasibility study investigating alternative surface and underground coal clearance options for when Angus Place Colliery re-commences mining under their current project approval.

3.3.4 Mt Piper Haul Road

The Mt Piper haul road is used for traversing between Angus Place Colliery and Mt Piper Power Station. A private haul road linking SCSS to Mount Piper Haul Road is approved but not yet constructed. Haul trucks are a noise source with the potential to impact sensitive receptors on Wolgan Road and Blackmans Flat. Due to Angus Place Colliery being on care and maintenance, there is currently no haulage occurring on this haul road.

3.3.5 Overland Conveyor System

The overland conveyor system links the Springvale Coal Services site, Lidsdale Siding, Springvale Mine, Mt Piper and Wallerawang Power stations. The operation of the overland conveyor has the potential to impact on a number of sensitive receptors in Lidsdale, Wallerawang and Blackmans Flat.

3.4 Noise Environment

WCS operations (SCSS, Mt Piper haul road) and the Mt Piper Power Station contribute to the noise environment in Blackmans Flat. Historically at Lidsdale, the contributing noise sources have been Lidsdale Siding operations, Wallerawang Power Station, Wallerawang haul road and the overland conveyor system. Both the overland conveyor system and SCSS have existed for over 20 years and were constructed to facilitate Springvale Mine operations. Wallerawang Power Station was decommissioned in November 2014, however existed for over 50 years before then. It should be noted that the haul roads, overland conveyor system, Wallerawang and Mt Piper Power Stations, Lidsdale Siding, Springvale Mine and Angus Place Colliery all existed, were operational and, were a part of the local noise environment at the time of the WCS development application in 2013.

Refer Figure 1 for a regional context and Figure 2 that outlines the elements of WCS.

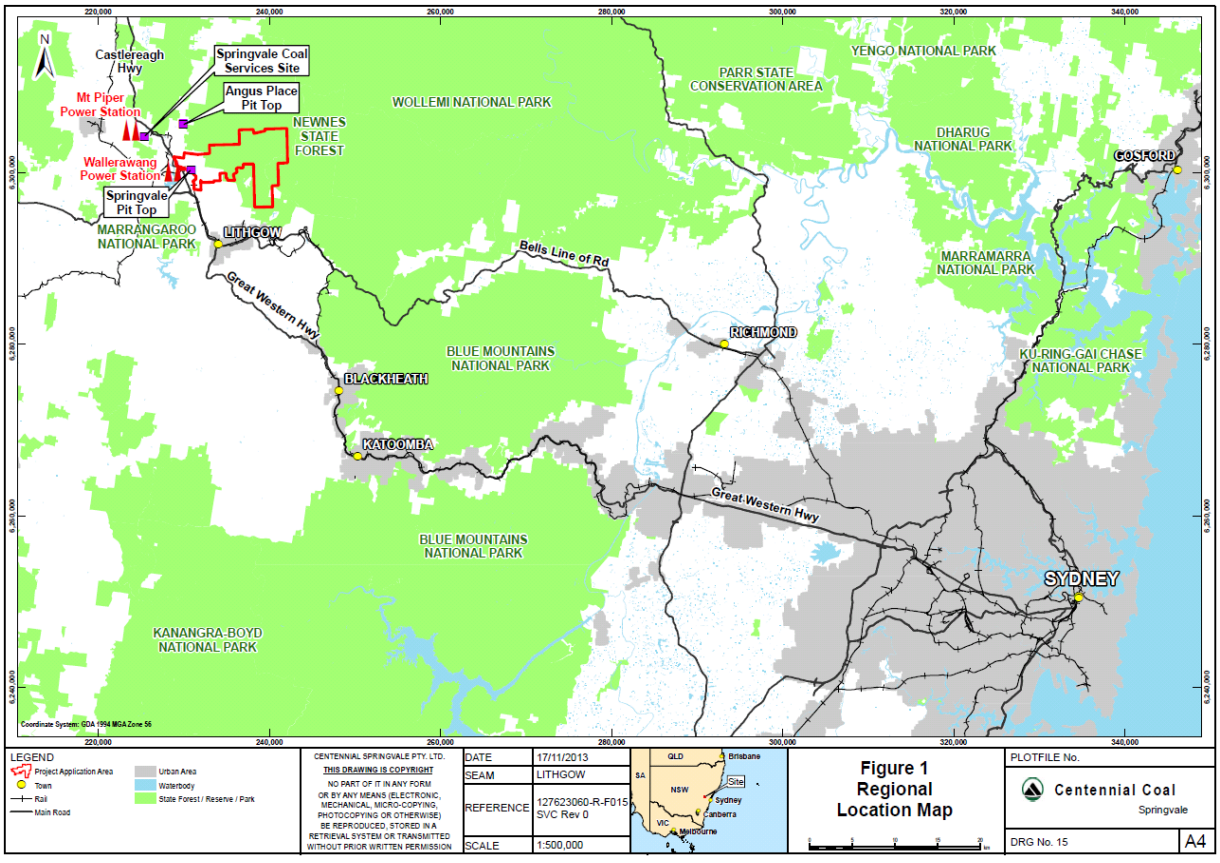


Figure 1: Springvale Mine Regional Context

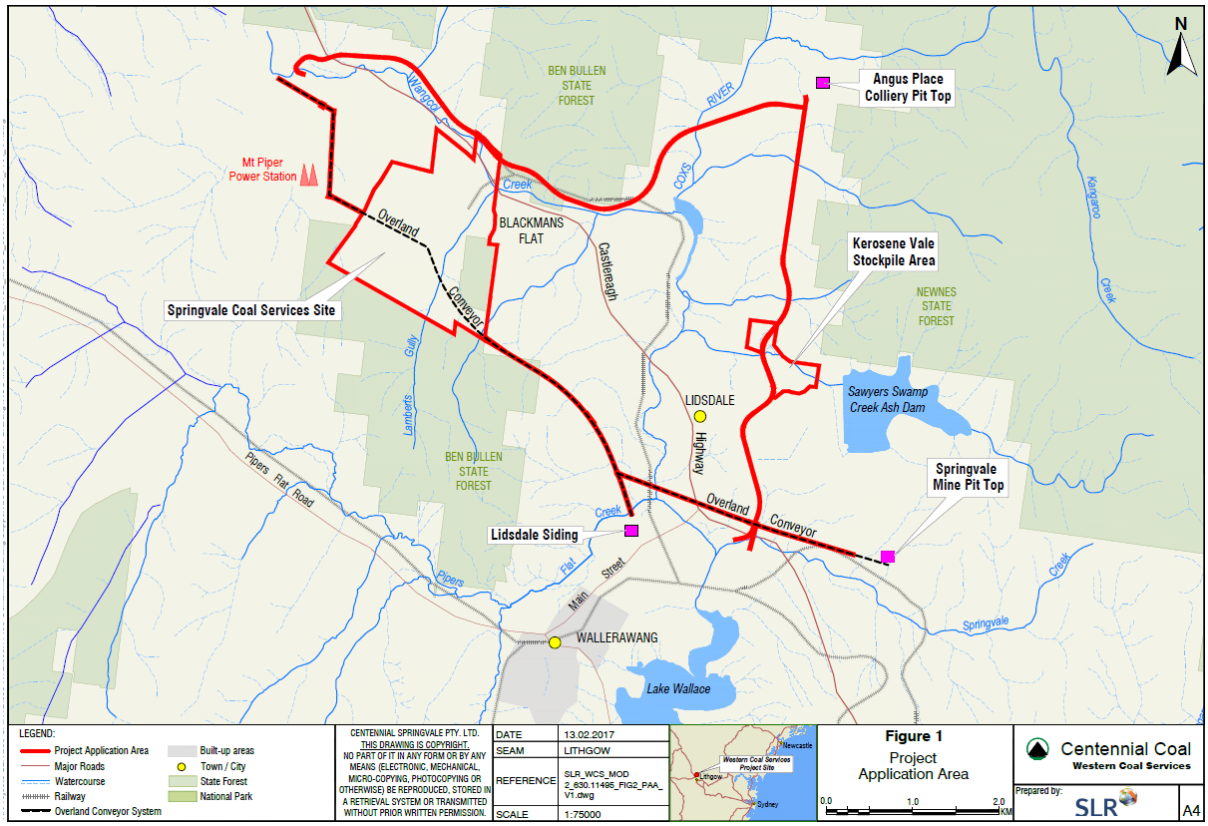


Figure 2: Western Coal Services Project

4. COMMUNITY PROFILE

4.1 Overview

The vision for the Lithgow LGA was developed in collaboration with the community and adopted by Council in 2006. It sets a vision for the next 10 to 20 years for the Local Government Area. The overarching vision statement is:

A centre of Regional excellence that:

- *Encourages community growth and development.*
- *Contributes to the efficient and effective management of the environment, community and economy for present and future generations.*

According to the most recent Australian Bureau of Statistics (ABS) Census (2016), the Lithgow LGA population on Census night was 21,090 which represent a 4.4% increase in population since 2011. The majority of the population live in Lithgow urban area and according to the 2016 census the population is 12,818 people (SA2), Wallerawang (1,980 people) and Portland (2,424 people). The remainder of the population live across the smaller villages, hamlets and rural localities across the LGA. Table 1 summarises population characteristics of the LGA between 2001 and 2016.

Table 1: Time Series Data (2001 – 2016) – Lithgow LGA

Selected Medians	2001	2006	2011	2016
Population	19,332	19,756	20,161	21,090
Median age of persons	37	40	42	45
Median total household income ($ weekly)	-	$738	$$896	$984
Median total family income ($ weekly)	$822	$1,027	$1,190	-
Median total household income ($ weekly)	$642	$751	$894	$984
Median mortgage repayment ($ monthly)	$750	$1,083	$1,452	$1,387
Median Rent ($ weekly)	$110	$135	$170	$230
Average household size	2.5	2.4	2.3	2.3

Source: ABS Census

Table 2: Age Structure - Service Age Groups

	2016			2011			Change
Service age group (years)	**Number**	**%**	**Regional NSW %**	**Number**	**%**	**Regional NSW %**	**2011 to 2016**
Babies and pre-schoolers (0 to 4)	1,178	5.6	5.8	1,280	6.3	6.3	-102
Primary schoolers (5 to 11)	1,716	8.1	8.9	1,749	8.7	9.0	-33
Secondary schoolers (12 to 17)	1,444	6.9	7.3	1,564	7.8	8.2	-120
Tertiary education and independence (18 to 24)	1,539	7.3	7.9	1,552	7.7	8.1	-13
Young workforce (25 to 34)	2,256	10.7	11.0	1,978	9.8	10.4	+278
Parents and homebuilders (35 to 49)	3,656	17.3	18.0	3,975	19.7	19.5	-319
Older workers and pre-retirees (50 to 59)	3,179	15.1	13.8	2,964	14.7	13.9	+215
Empty nesters and retirees (60 to 69)	2,973	14.1	13.1	2,681	13.3	11.9	+292
Seniors (70 to 84)	2,620	12.4	11.4	2,035	10.1	10.3	+585
Elderly aged (85 and over)	516	2.4	2.7	383	1.9	2.3	+133
Total	**21,077**	**100.0**	**100.0**	**20,161**	**100.0**	**100.0**	**+916**

Source: ID Profile: www.council.lithgow.com

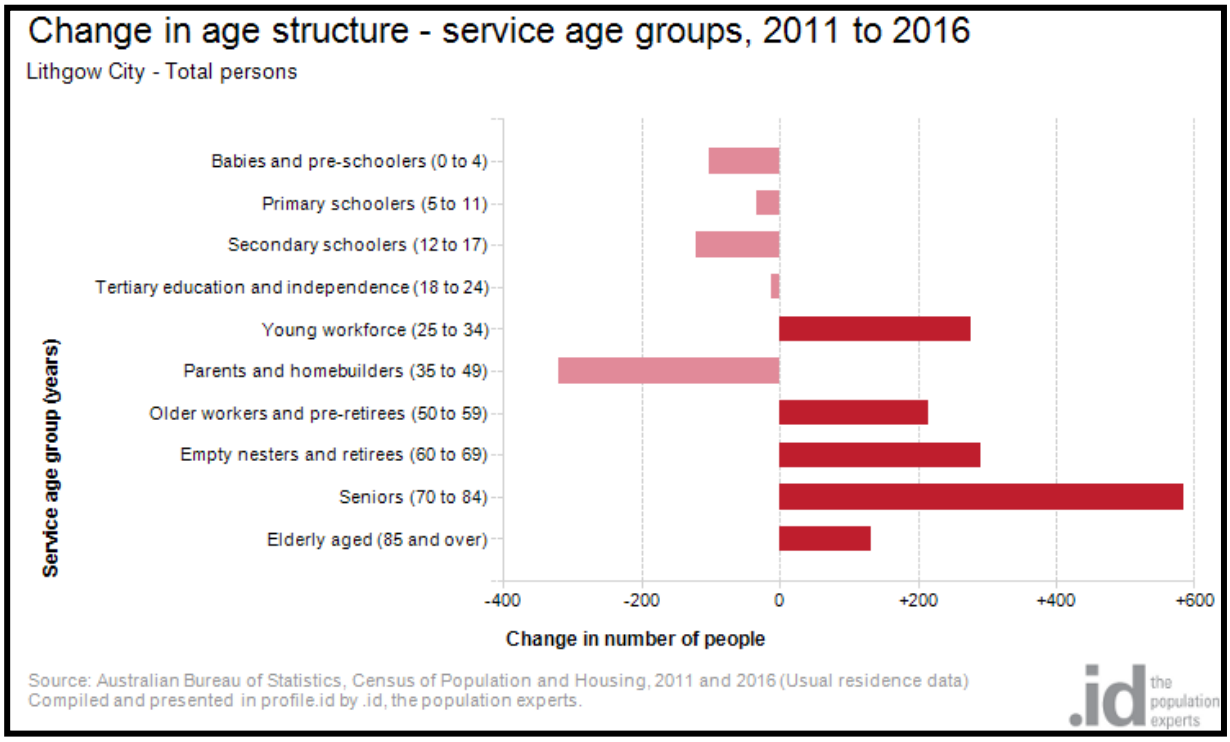


Figure 3: Change in Age Structure: Lithgow LGA 2011 – 2016 (Source: ID Profile: www.council.lithgow.com)

Table 3: Housing Tenure: Lithgow LGA 2011 - 2016

	2016			2011			Change
Tenure type	**Number**	**%**	**Regional NSW %**	**Number**	**%**	**Regional NSW %**	**2011 to 2016**
Fully owned	3,318	38.4	35.5	3,152	38.8	36.6	+166
Mortgage	2,320	26.9	28.6	2,442	30.1	29.7	-122
Renting	1,962	22.7	26.5	1,922	23.7	27.0	+40
Renting - Social housing	445	5.2	4.2	438	5.4	4.8	+7
Renting - Private	1,471	17.0	21.6	1,419	17.5	21.4	+52
Renting - Not stated	46	0.5	0.7	65	0.8	0.8	-19
Other tenure type	84	1.0	1.0	68	0.8	0.9	+16
Not stated	949	11.0	8.4	531	6.5	5.8	+418
Total households	**8,633**	**100.0**	**100.0**	**8,115**	**100.0**	**100.0**	**+518**

Source: ID Profile: www.council.lithgow.com

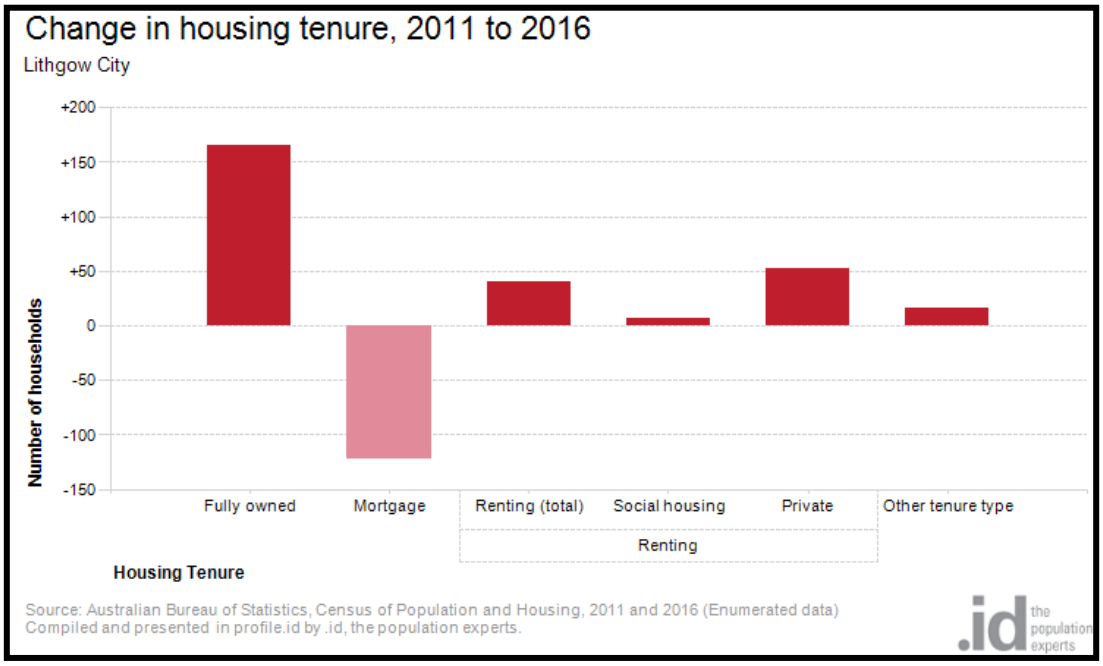


Figure 4: Change in Housing Tenure Lithgow LGA 2011 – 2016 (Source: ID Profile: www.council.lithgow.com)

Population summaries for the areas surrounding WCS (Wallerawang, Lidsdale and Blackman's Flat) are listed in Tables 4, 5 and 6.

Table 4: Population Summary Wallerawang (2016 – 2011)

Wallerawang		
Population Characteristic Summary	**2016**	**2011**
People	**1,980**	**1,902**
Male	992	989
Female	988	913
Median Age	40	39
Families	498	518
Average children per family for families with children	2	2
Dwellings	**788**	**767**
Average people per household	2.6	2.6
Median weekly household income	$1,135	$1,125
Median monthly mortgage repayments	$1,517	$1,517
Median weekly rent	$200	$170

Source: ABS Census

Table 5: Population Summary Lidsdale (2016 – 2011)

Lidsdale		
Population Characteristic Summary	**2016**	**2011**
People	**429**	**513**
Male	231	265
Female	197	248
Median Age	41	39
Families	93	**127**
Average children per family for families with children	2.1	2.2
Dwellings	**155**	**208**
Average people per household	2.8	2.9
Median weekly household income	$1,487	$1,329
Median monthly mortgage repayments	$1,335	$1,517
Median weekly rent	$277	$170

Source: ABS Census

Table 6: Population Summary Blackman's Flat (2016)

Population Characteristic Summary	**2016**
People	**28**
Male	10
Female	18
Median Age	47
Families	6
Average children per family for families with children	2
Dwellings	**8**
Average people per household	2
Median weekly household income	$1,624
Median monthly mortgage repayments	$0
Median weekly rent	$0

Source: ABS Census. (Note: 2011 data for Blackman's Flat is incorporated into Lidsdale data. Refer Table 5)

4.2 Economic Profile

Lithgow has a long history with mining and power generation and today the economic base of Lithgow is still recognised as being the energy and resources sector. These sectors are major employers and subsequently make a significant contribution to the overall economy including retail and accommodation via direct and indirect employment opportunities occurring.

The mining and energy sectors also present some challenges brought about by fluctuations in coal prices. However, the importance of the coal mining industry and its related employment is clearly vital to the broader economic wellbeing of the area. The largest employment sectors in the Lithgow LGA are:

- Mining
- Public Administration and Safety
- Health Care and Social Assistance
- Retail Trade
- Accommodation and Food Services

Table 7 provides an overview of the employment profile for Lithgow LGA and Table 8 illustrates the value added by industry sector of the LGA's economy.

Table 7: Employment by Industry: Lithgow LGA

Lithgow City Council	2015/16			2010/11			Change
Industry	**Number**	**%**	**New South Wales%**	**Number**	**%**	**New South Wales%**	**2010/11 to 2015/16**
Agriculture, Forestry and Fishing	353	3.9	2.3	259	2.9	2.3	+94
Mining	1,342	14.8	1.0	1,345	14.9	0.9	-3
Manufacturing	582	6.4	7.9	612	6.8	8.5	-31
Electricity, Gas, Water and Waste Services	528	5.8	1.2	471	5.2	1.2	+58
Construction	535	5.9	7.6	603	6.7	7.6	-68
Wholesale Trade	192	2.1	4.5	172	1.9	4.6	+20
Retail Trade	758	8.4	10.3	817	9.0	10.3	-59
Accommodation and Food Services	726	8.0	7.0	730	8.1	6.8	-4
Transport, Postal and Warehousing	417	4.6	5.1	467	5.2	5.2	-50
Information Media and Telecommunications	70	0.8	2.5	72	0.8	2.5	-3
Financial and Insurance Services	141	1.6	5.3	144	1.6	5.3	-4

Lithgow City Council	2015/16			2010/11			Change
Industry	**Number**	**%**	**New South Wales%**	**Number**	**%**	**New South Wales%**	**2010/11 to 2015/16**
Rental, Hiring and Real Estate Services	91	1.0	1.8	90	1.0	1.8	+1
Professional, Scientific and Technical Services	230	2.5	8.5	235	2.6	8.4	-4
Administrative and Support Services	281	3.1	3.5	272	3.0	3.4	+9
Public Administration and Safety	885	9.8	6.3	850	9.4	6.3	+35
Education and Training	693	7.7	8.2	632	7.0	8.1	+61
Health Care and Social Assistance	815	9.0	11.5	888	9.8	11.3	-73
Arts and Recreation Services	80	0.9	1.5	72	0.8	1.5	+8
Other Services	318	3.5	4.0	310	3.4	4.0	+8
Total Industries	**9,038**	**100.0**	**100.0**	**9,041**	**100.0**	**100.0**	**-3**

Source data from National Institute of Economic and Industry Research (NIEIR) (2016). Compiled and presented by ID Profile www.lithgow.nsw.gov.au.

Table 8: Value Added by Industry Sector: Lithgow LGA.

Lithgow City Council - Constant prices	2015/16			2010/11			Change
Industry	**$m**	**%**	**New South Wales%**	**$m**	**%**	**New South Wales%**	**2010/11 to 2015/16**
Agriculture, Forestry and Fishing	25.4	2.3	1.7	21.6	2.1	2.1	+3.8
Mining	303.9	27.4	2.3	281.7	27.0	2.1	+22.2
Manufacturing	63.8	5.8	7.1	73.0	7.0	9.6	-9.2
Electricity, Gas, Water and Waste Services	162.4	14.7	2.9	151.6	14.5	3.2	+10.8
Construction	63.5	5.7	7.4	75.6	7.3	6.6	-12.1
Wholesale Trade	20.3	1.8	5.3	14.6	1.4	5.2	+5.8
Retail Trade	37.5	3.4	5.2	34.9	3.4	5.0	+2.5
Accommodation and Food Services	40.5	3.7	3.3	36.4	3.5	3.4	+4.0
Transport, Postal and Warehousing	41.4	3.7	5.1	43.3	4.2	5.2	-1.9

Lithgow City Council - Constant prices	2015/16			2010/11			Change
Industry	**$m**	**%**	**New South Wales%**	**$m**	**%**	**New South Wales%**	**2010/11 to 2015/16**
Information Media and Telecommunications	9.4	0.8	4.8	9.5	0.9	4.7	-0.1
Financial and Insurance Services	27.2	2.5	15.2	25.8	2.5	14.2	+1.4
Rental, Hiring and Real Estate Services	13.9	1.3	4.2	9.9	1.0	3.2	+3.9
Professional, Scientific and Technical Services	19.8	1.8	8.8	18.2	1.8	8.6	+1.6
Administrative and Support Services	32.1	2.9	3.6	29.9	2.9	3.8	+2.2
Public Administration and Safety	109.5	9.9	6.1	93.4	9.0	6.2	+16.1
Education and Training	54.0	4.9	5.7	46.6	4.5	6.1	+7.4
Health Care and Social Assistance	60.1	5.4	7.8	55.1	5.3	7.2	+4.9
Arts and Recreation Services	4.1	0.4	1.2	3.8	0.4	1.3	+0.4
Other Services	18.9	1.7	2.4	17.0	1.6	2.4	+1.9
Total Industries	**1,107.6**	**100.0**	**100.0**	**1,042.0**	**100.0**	**100.0**	**+65.6**

Source data from National Institute of Economic and Industry Research (NIEIR) (2016). Compiled and presented by ID Profile www.lithgow.nsw.gov.au.

Mining remains the largest employer generating 1,342 local jobs and is also the most economically productive industry, generating $304 Million in 2015 / 2016. An analysis of the valued added by industry sectors in Lithgow City Council in 2015 / 2016 shows the three largest industries were:

- Mining ($304 million or 27.4%)
- Electricity, Gas, Water and Waste Services ($162 million or 14.7%)
- Public Administration and Safety ($109 million or 9.9%)

In combination these three industries accounted for $576 million in total or 52.0% of the total value added by industry in Lithgow City Council. In comparison, the same 3 industries in New South Wales accounted for 2.3% in Mining; 2.9% in Electricity, Gas, Water and Waste Services; and 6.1% in Public Administration and Safety (ID Profile www.lithgow.nsw.gov.au).

LCC website states that the emerging sectors of the LGA include:

- Artisan food producers – saffron, chocolates, baked products, olives, hazel nuts, condiments, fruit and vegetables.

- Creative industries – IT, graphic design, marketing, craft, photography, candles, soaps, music and performance.
- Financial Services, employment and training – accounting and conveyancing, industrial and mining sector labour hire and training services.
- Tourism services – bed and breakfast, short term accommodation, niche recreation providers.
- Independent Main St retailers – homewares, clothing, cafes, lifestyle

LCC website states that gaps in facilities and services include:

- Mid to large scale bulky goods businesses
- Patient care options
- Entertainment and recreation facilities
- Cafes, quality restaurants, menswear, ladies wear
- Tradespeople

4.3 Local Characteristics

The components that comprise Western Coal Services Project include two private haul roads (Mount Piper and Wallerawang Haul Roads), conveyors and Springvale Coal Services Site.

The general characteristics of the surrounds include the town of Wallerawang which is the closest retail and commercial centre (however Lithgow remains the main centre meeting higher order retail, commercial and professional service needs), Lidsdale which is a residential area and utilises day to day services from the nearby Wallerawang and locality of Blackmans Flat. The coal and rejects materials handling, and coal beneficiation (washing) is undertaken at the Springvale Coal Services Site (SCSS), located in Blackmans Flat.

A summary of the key services found in Wallerawang that would meet the day to day needs of residents are:

Community facilities:

- Council library and depot; medical and community health centres; recreational facilities including PJ Hall Memorial Park, Lake Wallace, playing fields and a skate park; police, fire services; the 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)); agency for the Commonwealth Bank; newsagent; bakery; butcher; service stations; hotels; takeaway store; hairdresser.

Lidsdale is a residential area adjacent to Wallerawang on the northern side of the Castlereagh Highway. Facilities include, Rural Fire Service; petrol station; tennis courts; Ted Hughes Memorial Park and a church.

The other areas around the SCSS include rural lands, rural residential, the Castlereagh Highway and the Newnes State Forest.

Rural land and isolated rural residents, transport infrastructure and State Forest (Ben Bullen State Forest and Newnes State Forest), coal mines (Angus Place colliery, Springvale Mine), rail loading infrastructure (Lidsdale Siding), power generation facilities (Mount Piper Power Station, Wallerawang Power Station (decommissioned and currently a demolition site), sub-regional road network including Castlereagh Highway are also characteristics of the general area.

Images of the area are shown in Figure 5 below and Figure 6 highlights the land use characteristics of the area.




Figure 5: Images of the Project Application Area

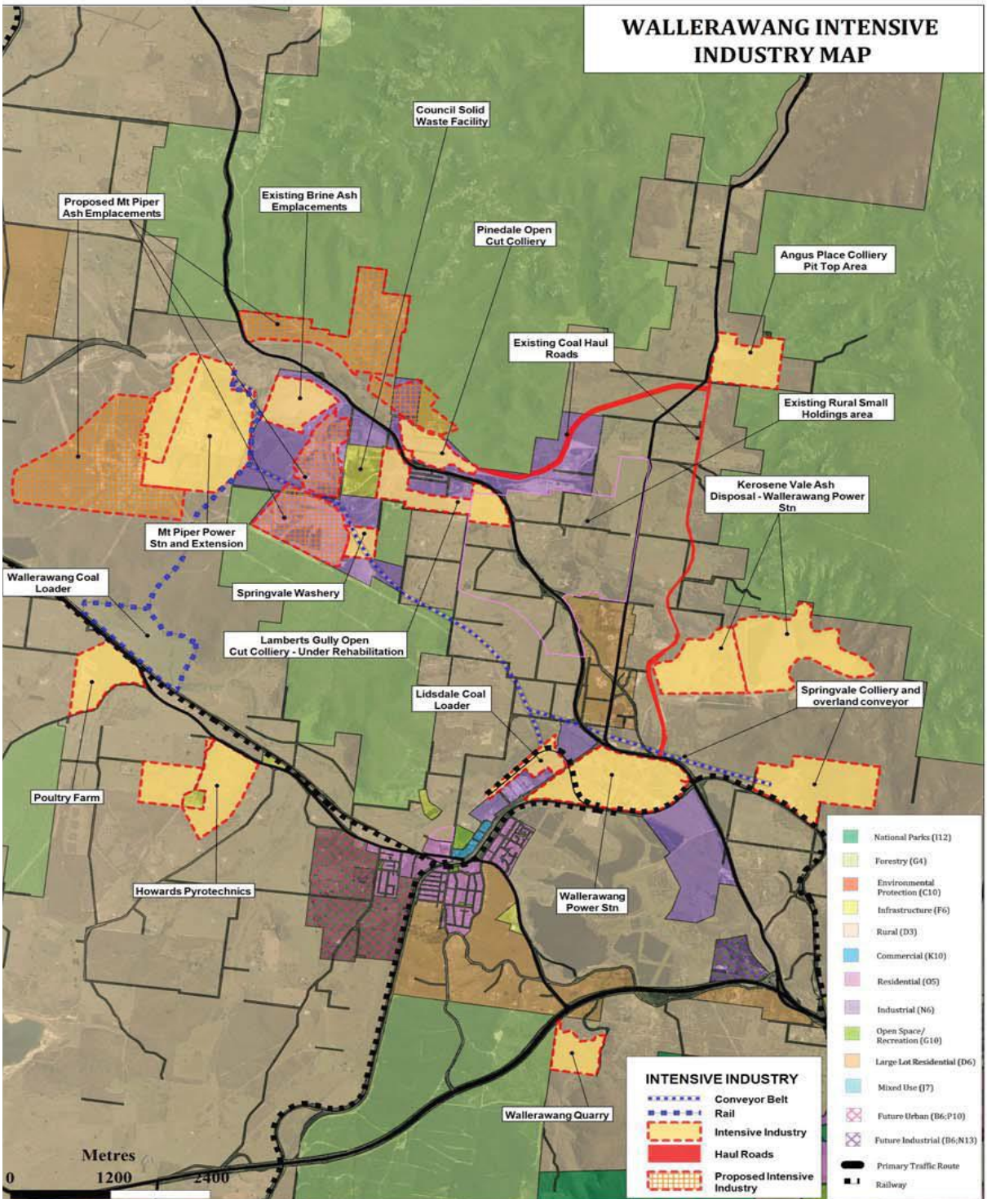


Figure 6: Land Use Characteristics

5. CONSULTATION

To assist in understanding the potential social impacts of the Project, the outcomes from previous consultation undertaken in the local area have been reviewed and summarised below. Summarised consultation outcomes are from the development of Lithgow City Council's Land Use Strategy, consultations undertaken by the Department of Planning and Infrastructure (in early 2011) and Centennial's own consultation in relation to projects such as the Western Coal Services upgrade, Springvale Mine Extension Project and related Modifications as applicable

5.1 NSW Government's Coal and Gas Strategy: Lithgow Regional Forum 25 February 2011

The former NSW Government presented a number of regional forums at the beginning of 2011 to discuss and explore the NSW Coal and Gas Strategy (now replaced with the Regional Strategic Land Use Strategy). A summary of relevant and key themes raised by speakers includes:

5.1.1 Issues relating to Coal Mining:

- Coal mining can affect landowners and environmental issues in the area may have resulted from coal burning.
- In relation to mining there should generally be better controls around impacts on the environment.
- There should be buffer zones where mining does not occur that provide clean zones for better lifestyle. We need to protect the ecology and biodiversity of an area.
- Mining can be very divisive in local and regional communities.
- We can't just look at the anti mining concerns – the Strategy needs to look at a set of balanced outcomes.
- The benefits of mining cannot be underestimated.

5.1.2 Social and community impacts:

- Given the Sydney Basin is almost exhausted for housing, the western areas (eg including in and around Lithgow) provides an opportunity to house people – mining may compromise that opportunity.
- There is a need to take into account the needs of future generations in terms of health, housing, ageing population etc., and provide suitable environments for them to live.
- The issues for balance and certainty for communities is an important issue that needs to be addressed.
- There is a reluctance of industry to embrace the protection of other values.
- Serious consideration needs to be given to the assumptions and values that we place on the growth of energy demand and its importance in terms of jobs.

- In 20 years time we may be talking about shortages of food – The question of what are our long term goals and priorities for the use of our land should be an important consideration in the development of a Coal and Gas Strategy.
- Tourism – local and regional tourism would be devastated by mining.
- We need to model costs/benefits/value associated with good lifestyle areas, tourism and ecological aspects.
- People are concerned about the health impacts and want to ensure they have a positive quality of life, health, food water and social connectivity to the community.
- We need to make sure all the values of different land uses, lifestyle opportunities, health benefits, food security etc are recognised.
- Don't forget disastrous effects and families on jobs – it was not long ago that there were protests about job losses in Lithgow due to mine closures.
- Legislation needs to change so that property owners know they are likely to be affected before the license is issued.
- There needs to be a better contribution towards the needs of communities cost of infrastructure needs to be met and contributed to.
- Need baseline data before we go forward to gauge cumulative impacts.
- Communities have been calling for independent studies for a long time.
- Local communities are being devastated by mining (churches, fire services, schools etc are losing people).
- If there is so much value for the state, will there be consideration to covering the community against the costs of these major developments?
- Social impact assessment should be undertaken to gauge impacts

5.2 Centennial Coal Community Information Sessions

In early 2012 Centennial undertook consultations and information sessions for Western Coal Services Project, Lidsdale Siding Upgrade, Springvale Mine and Angus Place Colliery developments. The consultation / information sessions 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; and
- 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 by the community in relation to the wider regional developments include:

- General visual impacts, particularly from open cut mining;
- Intensification of mining activities; and
- The recognition of impacts from sources other than Centennial such as other mining operations and the two power stations.

5.3 Land Use Strategy

In the development of its Land Use Strategy (LUS) Lithgow City Council consulted with the Wallerawang / Lidsdale and Blackmans Flat communities in March 2006. The following values and aspirations were identified:

- Increasing job opportunities for their children.
- Improved infrastructure for Wallerawang.
- Preventing Sydney type sprawl in the area.
- Preserving scenic landscapes.
- Maximising opportunities for sustainable business development.
- Promoting tourism.

Planning principles that have been taken forward from these initial consultations and incorporated into the development of the LUS are:

- There needs to be a consolidation of the town centre.
- Provide a land use structure cognisant with its current and future land use.
- Large lot residential to remain on the fringes of the urban areas.
- Regard for industrial nature and environmental constraints when considering future land uses.

Taking into consideration these identified values and aspirations and information contained in the LUS a Strengths, Weaknesses, Opportunities and Threat analysis (SWOT) was developed.

Strengths

- Established retail and commercial precinct within Wallerawang that meet the day to day needs of residents.
- Within close proximity to the Lithgow CBD which provides higher order services.

- Existing employment opportunities within established industries based around mining and power generation.

Weaknesses

- Fragmentation of land due to industrial development occurring in rural lands.
- Impacts on amenity by existing industrial/power generating development.
- Land constraints as a result of location of industry, railway, slope and topography etc.

Opportunities

- Potential for further industrial development in the area and subsequent associated industrial and commercial spinoffs.
- Capitalise on construction activity associated with the proposed expansion of Mt Piper Power Station.
- Opportunities for the development of short term accommodation options to meet the demand created by itinerant workers.

Threats

- Land use conflict.

Feedback from consultations consistently highlighted the importance of mining and power generation with regards to local employment and the economy. It was also highlighted that the ongoing development of industry should not be at the cost of residential amenity.

5.4 Consultation Undertaken for SSD 5579 (2012 – 2015)

As a result of the March 2012 community information sessions facilitated by Centennial Coal for the Western Coal Services project (SSD – 5579), a number of Blackmans Flat residents prepared a submission (dated 15 April 2012) outlining their opposition to the upgrade of the Project. Residents stated that the existing cumulative impacts of all the nearby projects have resulted in loss of property values; increased noise, including noise from blasting and truck movements; health issues relating to dust, visual impacts; restricted access to areas of the forest which were once enjoyed for walking and an overall loss in residential amenity.

Additional to this Project, resident's expressed concern that the then proposed expansion of Pine Dale; nearby ash placement for Delta; proposal by Enhance Place to open cut mine in Ben Bullen State Forest; the allocation of land for a rubbish tip and the suggested recommendation to zone Blackmans Flat as industrial (as per the Lithgow LUS in recognition of its dominant land use) would all have a significant adverse impact on residential amenity.

In their submission residents acknowledge the need to pursue growth in the economy and employment; and that the development of industry at Blackmans Flat makes a significant contribution to the local, regional and state wide economy. However these benefits have been at the detriment of the residents who live in this area. A group of Blackmans Flat residents attended the Central West Community Cabinet Meeting (held in Bathurst 4 June 2012) to present their issues relating to the impact of industry on their residential amenity.

Centennial Coal undertook consultation with people living in the Blackmans Flat area and found that residents have lived in this area for between 5 and in one case over 70 years. Residents have moved into the area for a range of reasons which include cheaper housing prices; some came to enjoy the rural amenity (prior to the expansion of industry) and some came with knowledge of the nearby industry.

A common theme arising from the various consultations is that the identified benefits arising from mining such as construction of additional infrastructure, maintenance of existing, and creation of additional, jobs etc. do not outweigh the importance of community amenity even if the industry operates within approved limits. As a result of these concerns an acquisition strategy was implemented for the properties located in the main residential area of Blackmans Flat located on the Castlereagh Highway near the SCSS entry. All properties except one have been acquired and demolished. The remaining property is an acquisition on request which is underway.

5.5 SIA Consultation Undertaken for Modification 2

A range of consultation strategies have been undertaken in relation to understanding the rationale and scope of this proposed Modification; exploring options to address identified issues and understanding landholder concerns and feeding these concerns into the project decision making process. In summary consultation has been undertaken is outlined in Table 9.

It is noted that consultation with the community has been undertaken in relation to the relating to the noise predictions included in the Statement of Environmental Effects supporting the proposed modification. Whilst the two other modification elements (workforce increase, product stockpile) were noted however were not discussed in detail as the specialist assessments have not identified any significant impacts.

The main focus of the consultation was to outline the history of non-compliance and the proposed strategies to address this issue with those affected by noise.

Table 9: Consultation Summary Modification 2

Who	Date	Comments
Project team:	Various	▪ Attend project team meetings to understand the rationale and scope of the modification, ▪ receive and review noise data from Global Acoustics and ▪ input into scope of modification.
Site personnel:	Various	▪ Noise Monitoring Location (NML) exceedance summary review. ▪ Review of complaint history. ▪ Site visit to all components of the WCS Project Application Area, including SCS, conveyors (incl. low noise idlers), haul road.
Landholder notifications:	Commenced 17 July 2017	Letter box drop to identified receptors with priority to include ▪ Receptors located near / adjacent to the project elements; ▪ Residents identified as a NML and ▪ Residents where a possible noise exceedance was

Who	Date	Comments
		identified post mitigation.
Landholder meetings:	Commenced 17 July 2017 and ongoing	Landholder meetings included: ▪ Residents spoken to during letter box drop ▪ Landholders who made contact as a result of the notification. These discussions were generally by on-site meeting. ▪ Residents identified as a NML and those where a possible noise exceedance was identified post mitigation.
Lithgow City Council:	9 August 2017	Provide a brief on the proposed Modification including the reasons why the Modification is required, incidences of non-compliance with the SSD 5579 noise criteria and subsequent need to mitigate noise sources and modify operations.
Western Region CCC:	9 August 2017	Provide a brief on the proposed Modification including the reasons why the Modification is required, incidences of non-compliance and subsequent need to modify operations.

The consultation material provided to the stakeholders listed in Table 7 consisted of the following:

- Letters to Noise Monitoring Locations – comprising residential receptors who had previously been provided with non-compliance notification letters as required by WCS consent(Section 4.2.1)
- Letters to General Stakeholders – comprising select additional sensitive receptors with the potential to be impacted by the WCS operations (Section 4.2.2).

In Sections 4.5.1 and 4.5.2 are copies of the information that was provided to affected landholders as way of introduction to the Modification elements.

5.5.1 Letters to Noise Monitoring Locations

You may have been in receipt of letters from Centennial's Springvale Coal Services (SCS) advising of non-compliance in relation to noise. These exceedances have resulted in SCS undertaking extensive noise monitoring and modelling of a range of operational scenarios that aim to minimize the risk of any further non-compliance.

SCS has identified a range of operational scenarios that will achieve this goal which, in summary include the following:

1. Apply operational restrictions to the Wallerawang Haul Road and Mount Piper Haul Road by not permitting trucks to operate during evening and night time periods. This will in effect remove the requirement to have a noise criteria apply in relation to the operation of the haul roads.
2. Replace conveyor belt rollers (idlers) with low noise idlers in order to reduce noise levels by up to 7 decibels. This work program has commenced and is expected to be completed by 31 December 2017.

3. Make operational changes to Springvale Coal Services to reduce modelled exceedances at private properties (including your property) to below 3 decibels. The proposed program indicates that noise will not exceed more than 1 decibels during the day and 2 decibels during the evening. There will be no noise exceedance during night time operations. Current noise criteria applied to the Springvale Coal Services site will not change. Operational changes include:

    a. Restrict dozer operations to day time periods only.

    b. Replace dozer with a quieter dozer such as a Komatsu 475A (or similar).

    c. Install low noise idlers along the noisy section of the Overland Conveyor within SCSS (OL2 and OL3) and the CW01 and CW02 sections of the internal onsite Conveyor System (as required in conjunction with other noise attenuation measures to achieve compliance).

    d. Clad the existing coal preparation plant (CPP) with noise attenuating panels (as required in conjunction with other noise attenuation measures to achieve compliance).

    e. Install noise barriers around the conveyor drives located on site (as required in conjunction with other noise attenuation measures to achieve compliance).

    f. All hired plant (e.g. loaders) used on site will meet, as a minimum, the sound power level used in the WCS Noise Model (Loader 109dB (Awt) / 113dB (linear) and Dozer 108dB (Awt) / 117dB (linear))

    g. A real time noise monitoring and management system will be implemented to manage compliance during evening and night time mobile plant use. Real time noise monitoring and meteorological data will be used to determine when mobile plant can be used on site during evening and night time periods. Mobile plant will not be used on site during evening and night time periods, when meteorological information indicates the likelihood of non-compliance with noise criteria (e.g. during adverse meteorological conditions).

The above mitigation measures will be implemented on a staged basis over the next 2 years with monitoring and model validation undertaken after each stage to determine noise level reductions achieved and requirements to continue the implementation of further mitigation measures.

With the above in mind, a representative from Springvale Coal Services would like to meet with you to explain the proposed modification in more detail and also give you the opportunity to discuss any concerns that you may have in relation to the operation of this site. Please contact James Marshall on 0423 605 324 or email james.marshall@centennialcoal.com.au to discuss specific details of the above.

Yours faithfully

James Marshall
Group Manager Stakeholder Engagement

5.5.2 Letters to General Landholders

As a near neighbor of Centennial's Springvale Coal Services (SCS) we would like the opportunity to speak with you in relation to noise management strategies that are being undertaken to address instances of noise arising from our operations exceeding our consent criteria. These exceedances have resulted in SCS undertaking extensive noise monitoring and modelling of a range of operational scenarios that aim to minimize the risk of any further non-compliance. SCS has identified a range of operational scenarios that will achieve noise compliance which, in summary include the following:

1. Apply operational restrictions to the Wallerawang Haul Road and Mount Piper Haul Road by not permitting trucks to operate during evening and night time periods.
2. Replace conveyor belt rollers (idlers) with low noise idlers in order to reduce noise levels by up to 7 decibels. This work program has commenced and is expected to be completed by 31 December 2017.
3. Make operational changes to Springvale Coal Services to reduce modelled exceedances at private properties. The proposed program indicates that noise will not exceed more than 1 decibel during the day and 2 decibels during the evening. There will be no noise exceedance during night time operations. Current noise criteria applied to the Springvale Coal Services site will not change.

The above mitigation measures will be implemented on a staged basis over the next 2 years with monitoring and noise model validation undertaken after each stage to determine noise level reductions achieved and requirements to continue the implementation of further mitigation measures.

With the above in mind, a representative from Springvale Coal Services would like to meet with you to explain the proposed works program and also give you the opportunity to discuss any concerns that you may have in relation to the operation of this site. Please contact James Marshall on 0423 605 324 or email james.marshall@centennialcoal.com.au to discuss specific details of the above.

Yours faithfully

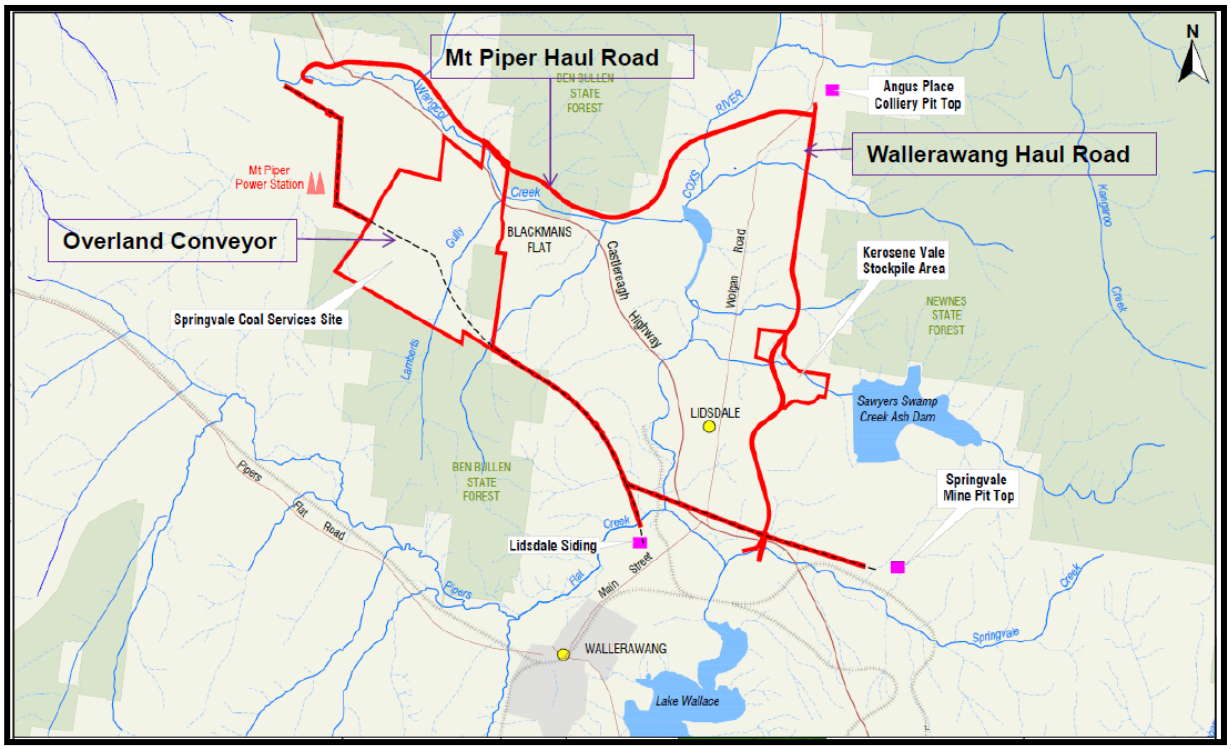
James Marshall
Group Manager Stakeholder Engagement.

5.5.3 Consultation Materials

Consultation material made available is:

- figures with WCS project components;
- areas of the overland conveyor where low noise idlers will be installed and
- plan of the various components of the Modification.

Examples are below.



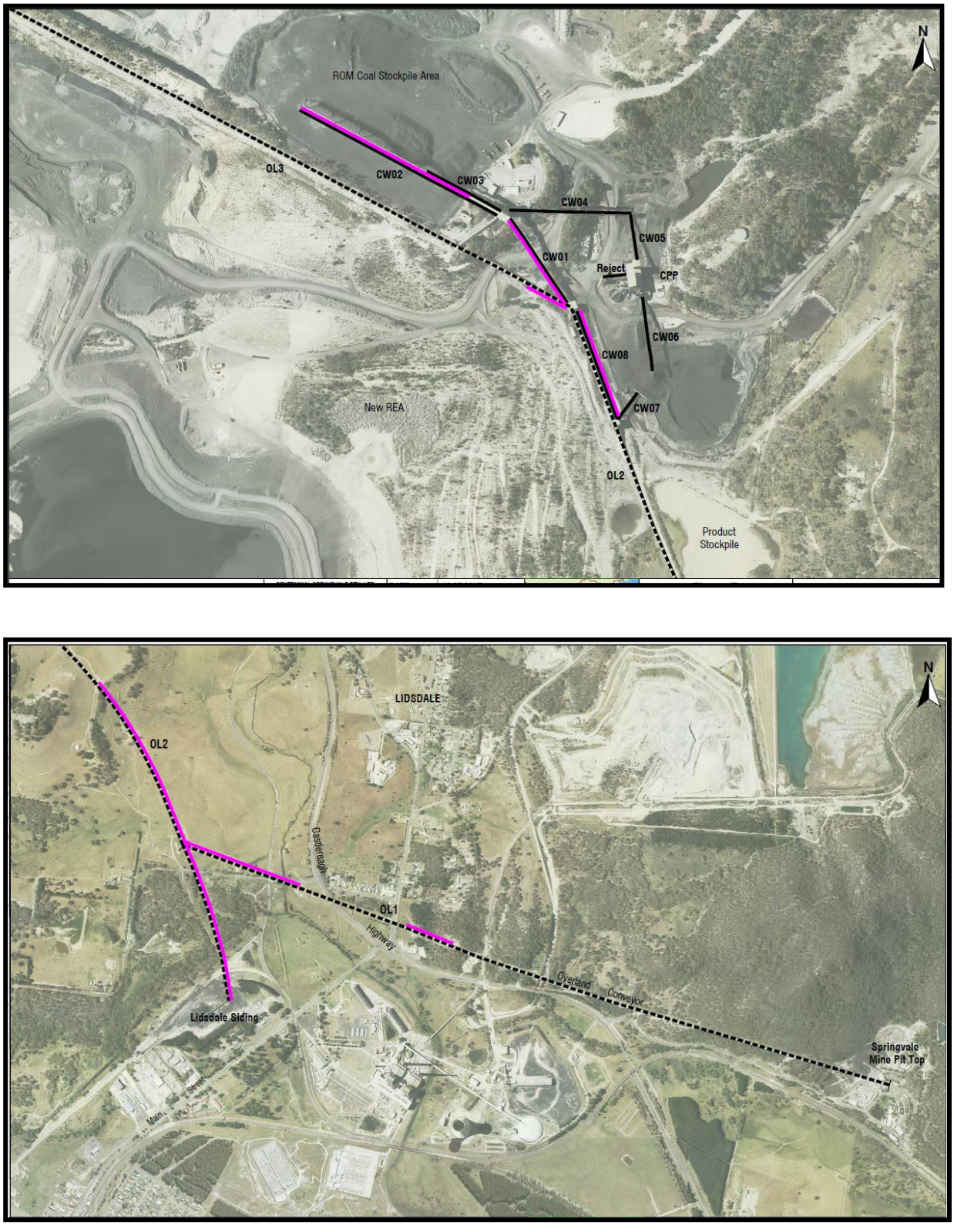
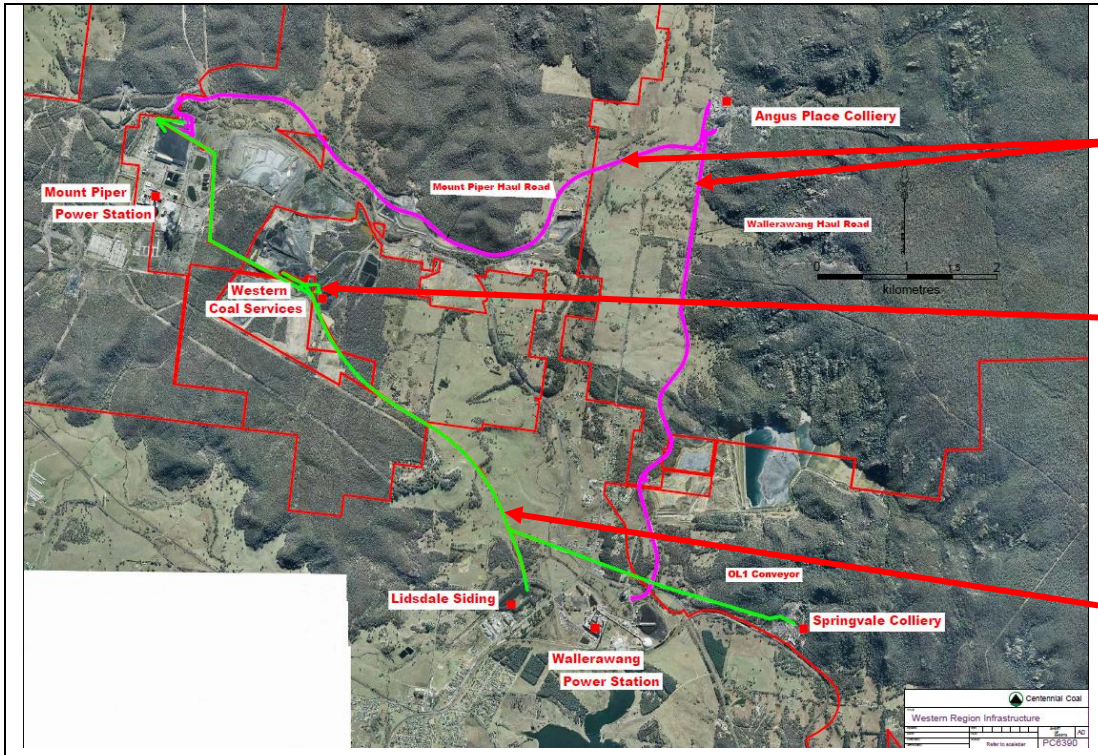


Figure 7: Sections of Overland Conveyors for Low Noise Idlers



Wallerawang Haul Road and Kerosene Vale Stockpile Area and Mount Piper Haul Road.

- Remove the noise criteria applying to the private haul roads subject to the imposition of operational restrictions during evening and night time periods

The Springvale Coal Services site.

- Apply the noise criteria to the SCSS operations only with additional noise mitigation measures implemented to reduce predicted exceedances at receptors to below 3 dBA or negotiated agreements with receptors predicted to receive 3dBA or more above the criteria being entered into.

The Overland Conveyor.

- Removal of the noise criteria applying to the Overland Conveyor subject to the rollout of the low noise idler program as detailed in the Work Plan

Figure 8: Modification Elements

5.5.4 Summary of Discussion

For residents in Wallerawang and Lidsdale no specific issues were identified in relation to the components of Western Coal Services operations. The non-operation of the haul roads (due to Angus Place Colliery placed under care and maintenance from March 2015) had changed the noise profile of the area as had the closure of the Wallerawang Power Station (i.e. quietened the noise environment). No issues were raised in relation to the past operation of the haul roads or the proposal to restrict haul road operations to day time only during Angus Place Colliery's development phase (when that commences) under current project approval.

For residents of Brays Lane, no specific issues were raised. However it is noted that between December 2013 And September 2014, mitigation work was undertaken at three residences located at / near the WCS noise monitoring location NM7 as per the approved WCS Noise Management Plan. A summary of the work undertaken (in relation to conveyor noise) is listed below.

- Double glazing on front and side of house.
- Double glazing on front and side of house and air conditioning.
- Double glazing on front of house.

Residents located along the southern side of the Castlereagh Highway at Lidsdale / Blackmans Flat, closest to the conveyors were consistent in stating that the conveyors were audible 'at times'; specifically at evening / night time periods. Specific noise issues in relation to the conveyors include increased noise as a result of a faulty conveyor roller and the noise generated when the conveyor started operating from a stationary position. Overall the noise impact described was not offensive in these locations. The installation of low noise idlers was well received.

For some residents located along the northern side of the Castlereagh Highway at Lidsdale / Blackmans Flat (i.e. away from the conveyors) described an audible sound from the direction of the SCSS site and Mt Piper Power Station. Again this noise was not described as constant or offensive but the operation of the sites could be heard.

5.5.5 Impacts Unrelated to Modification 2

Other issues identified through the consultation are:

- Traffic noise from the Castlereagh Highway, especially due to areas where the road surface was uneven.
- Potential for noise impact from the proposed overpass at Blackmans Flat approved in the WCS consent (should it be constructed).
- Potential noise impact arising from the Neubeck Project should it proceed.

5.5.6 Specific Landholder Actions

Specific actions arose from the consultation.

- Update on construction of the overpass and Neubeck Project

- B13: Written request for acquisition received. Concern of noise impacts and incidences of non-compliance has undervalued their property which they wish to place on the market. While the mitigation work at SCSS will facilitate in achieving compliance in the long term, given the staged approach of the implementation of the mitigation measures over a two year period, the noise impact could potentially continue for up to two years. This request has been presented to Centennial's senior management.
- B4: Acquisition on request under SSD 5579. A request has been received and Centennial's internal process is underway. Schedule 4 Condition 5 of SSD 5579 on land acquisition requirements will be followed.

5.6 Ongoing Community Consultation

Modelling will be undertaken as the works program (refer Table 10) is implemented to verify the results achieved. The results will be reported as follows:

- Potentially affected residents. The information will include the works completed and the modelled results. This information will be via letter with the opportunity to make contact with a representative of the project.
- Western Regional Community Consultative Committee (CCC). A report will be provided at each Western Region CCC meeting and will include the works completed and the most up to date modelled results.
- Centennial Coal Website: An update on the works program and modelled results will be updated at each stage of the program.
- Newspaper notification. A six (6) monthly community update will be placed in the Lithgow Mercury and Village Voice outlining the progress of the works program, results achieved and project contact details.

The consultation program will be managed by the Group Manager Stakeholder Engagement.

Table 10: Staged Implementation of Noise Mitigation Controls at Springvale Coal Services Site

Stage	Mitigation Measure	Indicative Timing of Implementation of Noise Controls and Maintenance
1.	Restrict dozer operations to day time periods only.	Current practice
2.	Install low noise idlers along the CW01 and CW02 sections of the internal onsite Conveyor System	June 2018
3.	Install low noise idlers along the OL2 and OL3 sections of the Overland Conveyor System traversing through SCSS	June 2018
4.	Install noise barrier around the OL2/OL3 transfer point drive (as required in conjunction with other noise attenuation measures to achieve compliance	December 2018
5.	Clad the existing coal preparation plant (CPP) with noise attenuating panels (as required in conjunction with other noise	June 2019

	attenuation measures to achieve compliance).	
6.	Upgrade modelled mobile plant used on site to meet, as a minimum, the sound power level used in the WCS Noise Model (Loader 109 dB (Awt) / 11 3dB (linear) and Dozer 108 dB (Awt) / 117 dB (linear))	December 2019
7.	Review SPLs of mitigated fixed and mobile plant at SCSS on a regular basis to determine if maintenance and replacement of noise controls are required.	Ongoing

6. SCOPING OF POTENTIAL SOCIAL IMPACTS

6.1 Scoping of Potential Social Impacts

A review of specialist reports prepared to understand the potential impact of the Modification elements. These are summarised below.

6.1.1 Air Quality Impact Assessment (SLR July 2017)

The Air Quality Impact Assessment (SLR, 2017) states that the approved scenario has been modelled representing all approved activities in the WCS Project operating concurrently over a year. In reality not all approved activities have been constructed as yet within the WCS Project and not all existing activities operate concurrently. Additionally the Bathurst air quality data used as background has been shown to be conservative when compared to the measured air quality data from WCS operations. As such the results presented in the air quality assessment are considered conservative. The overall conclusion in SLR (2017) is that there are no constraints in relation to air quality impacts at nearby residential locations in regards to the changes proposed for Modification 2

6.1.2 Traffic Impact Assessment (ARC Traffic and Transport (April 2017)

The Traffic impact Assessment (ARC Traffic and Transport, 2017) has found that the additional staff trip generation would be by any measure minor, resulting in no more than 7 additional vehicle trips to the SCSS during the AM and PM peak periods resulting in negligible impact to the traffic flows on Castlereagh Highway. Further to this minor increase and accounting for the forecast year of 2027, the SCSS access intersection will continue to operate at a high level of service (Level of Service 'A'), with essentially no delays or queued vehicles, and with significant spare capacity. In addition, no higher order treatment to the intersection is required.

6.1.3 Noise Impact Assessment (Global Acoustics July 2017)

Due to measured non-compliances at a number of noise monitoring locations, an extensive noise modelling impact assessment has been undertaken which has found that unmitigated operations at SCSS noise criteria would exceed the relevant day, evening and night criterion at 22, 29 and 27 receptor locations respectively, out of the 168 sensitive receptors assessed. After the assessment of various operational and mitigation scenarios (which have formed the basis of this assessment) impacts are reduced to 9, 5 and 7 receptor locations for the day, evening and night periods respectively. All of the mitigated predictions are within 2 dB of the WCS Consent criteria. A

predicted 2 dB exceedance is not considered significant by Global Acoustics (2017). However, the mitigation measures are proposed to be staged over a two year period and it is possible that exceedances of the noise criteria could be occur in that period. However the priority sequencing of the mitigation measures will allow SCSS to achieve compliance in the shortest time-frame and as early as June 2018 at the Blackmans Flat receptors closest to the SCSS operations. In the long term the noise levels in the region will be the lowest they have been since the commencement of the SCSS and the overland conveyor operations.

6.2 Assessment of Social Impacts

The following tables (Tables 11 - 20) are 'populated' based on the findings of the assessment of potential social impacts arising from the proposed modification including an understanding of the background of the issue, specialist assessment reports (noting that these reports indicate that noise is the primary area of assessment in this SIA), proposed mitigation and outcomes that are to be achieved from the proposed works program.

The tables allocate a score (determined by the extent of impact identified above) against the various items assessed in the SIA. Where there is no or a positive impact no score is allocated, where there is an adverse impact a score of 1,, 2 or 3 is allocated depending on the degree of impact identified.

Table 11: Population Characteristics

Effect	Causes	Comment	Score			
			No / positive impact	Low Impact	Medium Impact	High Impact
			0	1	2	3
The development will change the characteristics of the general population or persons who live or interact in or around any site in question.	Purchase property due to adverse social amenity impacts that cannot be mitigated.	Unmitigated levels show 78 exceedances altogether in all three periods (day, evening, night and could impact on receptors B12, B13, B14, B15, B16, included in SSD 5579. Mitigated levels show 21 exceedances in all periods, however are within 2 dB of consent criteria for all relevant receptors. The Noise Impact Assessment considers this exceedance of up to 2 dB as insignificant.	0			
	Existing landholders relocate from the area due to mine operations and loss of social fabric, knowledge, networking and sense of community.	No Impact Identified	0			
	Increased in the number of tenancies across the area due to property in mine ownership. This results in different values to the area, land management practices and loss of social fabric, neighbouring etc.).	No Impact Identified	0			
	FI/FO or DI/DO workers coming to the area resulting in positive financial contribution to some sectors however do not contribute to the sense of community and create other impacts such as increased housing costs.	No Impact Identified	0			
Total Score 0			0	-	-	-

Table 12: Disadvantage and Benefit

Effect	Causes	Comment	Score			
			No / positive impact	Low Impact	Medium Impact	High Impact
			0	1	2	3
It is likely the development will disadvantage or benefit individuals or groups (including specific target/population groups).	Positive pay packet effect in the immediate local area to some / all sectors.	Positive Impact Identified by ongoing and additional employment	0			
	Positive pay packet effect however not in the immediate area, but on a broader regional level.	Springvale employee characteristics show that 77 percent of the workforce live within 15 klm of the place of work.	0			
	Increase in housing rental and housing purchase prices due to demand brought about by the project.	No Impact Identified	0			
	Increased number of housing investors taking advantage of accommodation demand for mine personnel.	No Impact Identified	0			
	Artificial increase in pricing for certain commodities / goods / housing.	No Impact Identified	0			
	Sterilisation of land for private development.	No Impact Identified	0			
	Reduced access to publicly accessible land.	No Impact Identified	0			
Total Score 0			0	-	-	-

Table 13: Employment

Effect	Causes	Comment	Score			
			No / positive impact	Low Impact	Medium Impact	High Impact
			0	1	2	3
Changes to employment opportunities	Direct and indirect employment created by the project.	Positive Impact Identified by the additional 7 positions created	0			
	Longevity / certainty of employment for existing employees and indirect employment.	Positive Impact Identified	0			
	Redistribution of employment patterns – i.e. mining attracting people due to higher wages whereas other sectors may not have this advantage.	No Impact Identified	0			
	Increased trade in other services (i.e. accommodation, retail) resulting in additional employment opportunities.	No Impact Identified	0			
Total Score 0			0	-	-	-

Table 14: Housing

Effect	Causes	Comment	Score			
			No / positive impact	Low Impact	Medium Impact	High Impact
			0	1	2	3
Impacts on existing housing stock will occur	Increase in demand from FI/FO or DI/DO workers.	No Impact Identified	0			
	Increased demand for tenancies.	No Impact Identified	0			
	Increased / inflated housing costs making housing unaffordable for a larger cohort of the community.	No Impact Identified	0			
	Decrease in the availability of and access to affordable housing stock.	No Impact Identified	0			
Total Score 0			0	-	-	-

Table 15: Community Infrastructure

Effect	Causes	Comment	Score			
			No / positive impact	Low Impact	Medium Impact	High Impact
			0	1	2	3
Additional utilisation of community infrastructure will occur (roads, community halls, child care facilities, sporting and recreation etc.)	New services and facilities required ancillary to the project due to population increase arising from the project.	No Impact Identified	0			
	Increase in employee traffic to and from the site.	Negligible adverse impact identified however there is a minor increase in traffic flow.		1		
	Ongoing use of existing services by existing workforce.	Positive Impact Identified	0			
Total Score 1			-	1	-	-

Table 16: Community Support Services

Effect	Causes	Comment	Score			
			No / positive impact	Low Impact	Medium Impact	High Impact
			0	1	2	3
Additional support services will be required to meet the demands of any identified changes	New services and facilities required ancillary to the project due to population increase or decrease (in the case of mine closure).	No Impact Identified	0			
Total Score 0			0	-	-	-

Table 17: Service Demand

Effect	Causes	Comment	Score			
			No / positive impact	Low Impact	Medium Impact	High Impact
			0	1	2	3
Existing support services will be utilised to an extent where they are unable to meet the demand	Ongoing use of existing services however demand increased as a result of mine closure / increase in workforce.	No Impact Identified	0			
Total Score 0			0	-	-	-

Table 18: Conflict

Effect	Causes	Comment	Score			
			No / positive impact	Low Impact	Medium Impact	High Impact
			0	1	2	3
The proposal is likely to cause conflict within the community (i.e. is not supported, or there is conflict between supporters and non-supporters)	Visual impact caused by the location of infrastructure, lighting etc.	No Impact Identified as all infrastructure is existing	0			
	Change in environmental conditions (e.g. adverse noise and air quality impacts from the mines operations, changes to water quality and availability).	A positive impact identified because the noise environment will improve due to mitigation and operational changes. Priority sequencing of mitigation measures to be implemented with noise sources making the greatest contribution being mitigated first. The program will be undertaken until noise from the SCSS operations achieves compliance. .			2	
	Transport noise caused by rail / trucks and employee movements.	Negligible impact may arise due to increased traffic however somewhat mitigated due to the main transport route being along the Castlereagh Highway.		1		
Total Score 3			0	1	2	

Table 19: Community Identity

Effect	Causes	Comment	Score			
			No / positive impact	Low Impact	Medium Impact	High Impact
			0	1	2	3
An impact on community identity is likely	Caused by: Change in population structure (i.e. relocation of landholders due to property purchase).	No Impact Identified	0			
	Change in land characteristics that prevent use, development and / or access to certain areas.	No Impact Identified	0			
	Change to the social amenity due to noise, air quality, visual etc.	Positive impact identified once all mitigation and operational changes are implemented.	0			
Total Score 0			0	-	-	-

Table 20: Cultural Identity

Effect	Causes	Comment	Score			
			No / positive impact	Low Impact	Medium Impact	High Impact
			0	1	2	3
An impact on cultural identity is likely	Loss of community / public access to certain areas.	No Impact Identified	0			
	Loss of or reduced access to sites of significance (indigenous and European)	No Impact Identified	0			
	Threat of a change in lifestyle for land holders.	Positive impact identified once all mitigation and operational changes are implemented.	0			
	New project proposed within an existing community	No Impact Identified	0			
Total Score 0			0	-	-	-

7. RISK RANKING OF SOCIAL IMPACTS

7.1 Risk Ranking Overview

The identification of social impacts has been determined against the degree of impact identified as an outcome of the change in the noise impact once all mitigation and operational changes has been made. The assessment has taken into account that there are currently incidences of non-compliance and the overall objectives of the Modification will take up to two years to implement.

The scores in Tables 11 – 20 are used to score the degree of social impact / risk. This method allows the company to:

- explore whether the risk is acceptable or if strategies are required to reduce the social risk rating;
- benchmark the social impact as a basis for monitoring future change.

Based on scores in Tables 11 – 20 the total score is 4. With reference to Table 21 (below) a score of 4 indicates that the social risk of the proposed modification elements is insignificant once all mitigation and operational changes are completed. This means that the Project will result in:

- An improved noise environment.
- No requirement to acquire properties.
- No change to the land use across neighbouring / nearby residential areas.
- Slight economic benefit due to increased employment.
- Complaints may be received requiring intervention.

Table 21: Social Risk Consequence Assessment

Score	Rating	Consequence Social and Economic Impact (SE)
81 - 102	Catastrophic	▪ Adverse change to the social amenity of an entire (defined) community outside of the PAA, which cannot be mitigated using conventional means, requiring purchase / compensation. ▪ Widespread change to the existing land use characteristic currently enjoyed by the community resulting in change to use, development, identity. ▪ Widespread changes to property value outside of the PAA due to adverse social amenity impacts. ▪ Adverse impact on non-mine related business due to mine operations.
61 – 80	Major	▪ Adverse change to amenity within the community requiring compensation / purchase of numerous properties. ▪ Mining operations change and / or limit the land use characteristics in some areas. ▪ There are adverse impacts on non-mine related businesses. ▪ There are changes in property values to some properties due to mine operations.

Score	Rating	Consequence Social and Economic Impact (SE)
41 – 60	Moderate	▪ Change in amenity generating complaints but can be mitigated at source to meet compliance. ▪ Increased demand on social infrastructure as a result of mine operations (i.e. roads, facilities).
6 - 40	Minor	▪ Slight change in social amenity but all aspects of operations are within compliance. ▪ Complaints may be received requiring intervention.
0 - 5	Insignificant	▪ Negligible change to the community – i.e. meaning change is not outside of normal conditions. ▪ No change to the land use within PAA or across neighbouring areas. ▪ Economic benefits have positive effect on business / community via direct spending, employment. ▪ Complaints may be received requiring intervention.

8. CONCLUSION

The modification to SSD 5579 to allow for:

- An increase in the amount of coal that can be received by the Project from Springvale Mine from the approved 4.5 million tonnes per annum (Mtpa) to up to 5.5 Mtpa on the overland conveyor.
- The establishment of a dedicated product coal stockpile of 80,000 tonne capacity in the vicinity of the coal preparation plant.
- Increase in workforce from the approved 18 full time equivalent (fte) personnel to 25 fte personnel.
- A revision in the application of noise limits in SSD 5579 and propose to restrict the limits to the SCSS operations only.

An assessment of specialist report prepared for the proposed modification to SSD 5579 confirms that noise is the primary social impact arising from the project. The requirement to review the noise limits for the Project have arisen due to ongoing non-compliance under normal operating conditions. It is found that the implementation of the proposed mitigation strategies will improve the overall noise environment for the area. Therefore, the Project will deliver an overall positive outcome for the community.

Priority sequencing of mitigation measures to be implemented with noise sources making the greatest contribution being mitigated first. The program outlined in table 7 shows that the staging may take until December 2019. Notwithstanding this, the Modification that is proposed will improve the amenity of the residential areas that surround and are surrounded by the Western Coal Services infrastructure.

Finally, B13's request for acquisition needs to be considered. This is based on the fact that there has been ongoing non-compliance resulting in the belief that this will adversely impact on the value of the property. This issue has arisen due to the owners wanting to sell the

property. It should be noted that the sequencing of mitigation works is such that the noise sources which make the greatest contributions to the predicted levels (in this case conveyors) will be mitigated first. This means B13 receptor plus other receptors in Blackmans Flat are unlikely to have any exceedances after June 2018.

The elements that are to be implemented to address noise impacts is a positive step to improve the noise environment across the Project area. Ongoing consultation with affected landholders and the community will be undertaken to outline the progress of the works program and verification of noise results.

9. REFERENCES

Australian Bureau of Statistics; Census of Population and Housing 2016, 2011, 2006

ARC Traffic and Transport (2017) Western Coal Services Modification 2 Traffic impact Assessment

Global Acoustics (2017) Western Coal Services Noise Impact Assessment.

Lithgow City Council: http://council.lithgow.com/vision-statement/

Lithgow City Council Land use Strategy 2010 – 2030 http://lithgow.com/landuse/

National Institute of Economic and Industry Research (NIEIR) (2016). Compiled and presented by ID Profile www.lithgow.nsw.gov.au.

NSW Department of Planning and environment (December 2016) Social impact assessment: Draft guidelines for State significant mining, petroleum production and extractive industry development.

SLR Consulting (2017) Air Quality Impact Assessment Western Coal Services Modification 2